

The ANNUAL MEETING of the Society for American Archaeology provides a forum for the dissemination of knowledge and discussion. The views expressed at the sessions are solely those of the speakers and the Society does not endorse, approve, or censor them. Descriptions of events and titles are those of the organizers, not the Society.

## Symposium Abstracts

### **[1] Forum · PUTTING PRINCIPLES INTO ACTION: EXAMPLES FROM THE FIELD (PRESIDENTIAL FORUM)**

The SAA's new Statement Concerning the Treatment of Human Remains sets out an ethos that is grounded in principles of respect, collaboration, and ethical practice and is illustrated by three case studies. In Canada, the Tk'emlúps te Secwépemc GPR survey has become a watershed moment—a Canadian awakening—of the genocide committed at Residential schools. The nature and sensitivity of the search for the missing children from the schools requires community-led research that incorporates Indigenous values, protocols, and methods. The survey sets a precedent for similar work to be driven by Indigenous community needs. In Louisiana, the River Parishes are laden with unmarked burials of once-exploited enslaved peoples. Shifts from agriculture to petrochemical use disturb and threaten these burial places. The stories of descendants demonstrate the growing need for human remains and cemetery site protections and the fundamental importance of community voices in decisions about them. Lastly, the interdisciplinary Tsantsas project has included Indigenous communities' viewpoints and consultation in every step. Representatives from Shuar communities, public organizations, and academia discuss the importance of such collaborations, their challenges and successes, and how they lead to pathways for repatriation, research, and exhibition of Shuar human remains and collections. These topics being discussed will get emotional please take care of yourself.

### **[2] General Session · ARCHAEOLOGY IN EASTERN EUROPE**

### **[3] Symposium · COMPARING EARLY SOCIOPOLITICAL TRAJECTORIES ALONG THE NORTH PACIFIC COAST OF SOUTH AMERICA**

The Peruvian and Ecuadorian coasts seem to show different cultural paths to attaining social complexity. For instance, it has been stated that while in the northern part (Ecuador) it is linked to sedentism, early pottery, and mainly the development of agricultural systems, in contrast, on the coast of Peru, such development has been linked to preceramic societies that focused on monumental ceremonial centers built by partially sedentary groups associated with a marine products-based economy complemented by agricultural resources. Both explanations have mostly been produced independently on either side of a national border. In other words, Ecuadorian archaeology sees Ecuadorian development as unique and different, while Peruvian archaeologists consider their record equally unique and refer to the "Peruvian model." In this symposium, we would like to incorporate studies from both Ecuador and Peru with the purpose of comparing and contrasting specific developments on both sides of the border, seeking to understand the variability but also the factors that influenced the rise of complex sociopolitical systems that were the foundation for later coastal societies.

### **[4] General Session · ARCHAEOLOGY OF THE NORTH AMERICAN ARCHAIC PERIOD**

### **[5] General Session · ANCESTRAL PUEBLOAN ARCHAEOLOGY**

### **[6] Forum · PATHWAYS TO FOOD PRODUCTION: REFLECTIONS ON THE CONTRIBUTIONS OF FIONA B. MARSHALL**

The origins and spread of food production are among the most important topics in human history and are central to major archaeological investigations around the world. Profound insights into early food production have come from researchers who have explored diverse food-systems, novel cases of domestication, and trajectories of underrepresented regions. For over 30 years, Fiona B. Marshall has been a driver of such research. This forum reflects on Dr. Marshall's contributions to the topics of animal domestication, mobile pastoralism, African prehistory, and ethnoarchaeology. Participants discuss the direct impact of Dr. Marshall's work on the field as well as recent advances from across the globe inspired by her approaches.

### **[7] Forum · AFTER I GET MY DEGREE, WHAT'S NEXT? GOING FROM THE CLASSROOM TO THE PROFESSION**

Archaeology is changing. Technological advances, emerging social issues, and changes in the legal framework are drastically changing how archaeology is practiced. The result is expanded employment opportunities, most of which are outside academia. Regardless, such opportunities are still highly competitive. Consequently, students entering the profession need to understand these new opportunities and what they need to know to transition from being a graduate student to a professional. This forum brings together professionals representing different aspects of the discipline to discuss where the profession is today and what is needed to succeed. The forum is aimed at those who have recently received their degree or are about to graduate and are trying to transition into the profession. The session will explore career opportunities and the skill sets graduates will need to launch and advance their career. Presenters/discussants represent a variety of disciplines, skill sets, career tracks, and organizations involved in archaeology.

### **[8] General Session · RECENT RESEARCH IN THE MISSISSIPPIAN AND LATE PREHISTORIC PERIODS**

### **[9] Symposium · GEOPACHA: EXPANDING SCALES OF ARCHAEOLOGICAL ANALYSIS THROUGH IMAGERY-BASED SURVEY IN THE ANDES**

This symposium provides an overview of initial analyses carried out by GeoPACHA: The Geospatial Platform for Andean Culture, History, and Archaeology, a collaborative project designed to facilitate the systematic survey of satellite and aerial imagery in the Andean region. GeoPACHA is a browser-based tool for documenting archaeological sites in Andean South America. Using a federated approach, the platform enables teams of trained students and supervising researchers to pursue problem-oriented systematic imagery surveys and record observational data to a central database using standardized data schema and data forms.

During 2020, six teams conducted imagery surveys in large areas of the north coast, central coast, north highlands, central highlands, and south central Andes, covering a total of about 185,000 km<sup>2</sup> and registering about 39,000 archaeological loci. The presentations in this symposium discuss the platform design and project findings, pointing toward promising lines of inquiry, including research on landscape and land use, defense networks, settlement planning, and interregional comparisons of settlement densities and distributions. We also discuss challenges of working with imagery-based data, how they complement field-based data, and prospects for future expansion of survey to cover even larger areas through the use of artificial intelligence and continued “brute force” methods.

**[10] Symposium · ARCHAEOLOGY WITH ALTITUDE PART 1: PAPERS IN HONOR OF MARK ALDENDERFER**

Dr. Mark Aldenderfer is recently retired Emeritus Professor at UC Merced. Over four decades, his scholarship has paved the way for advances in the archaeology of montane environments, quantitative methods, and geographic information systems. He has made theoretical contributions to the anthropology of hunter-gatherers, agricultural origins, power, and religion with case studies drawn from fieldwork in the Andes, Himalayas, Ethiopian highlands, and Mesoamerica. His scholarship appears in over 200 peer-reviewed articles, books, book chapters, and encyclopedia entries, and he has held editorial posts with *Latin American Antiquity*, *Current Anthropology*, and *Science Advances*. After earning his PhD from Penn State in 1977, he held positions at Northwestern, UC Santa Barbara, and the University of Arizona where he trained, mentored, and inspired many students who have extended his work in various theoretical, methodological, and geographic domains. These papers honor Dr. Aldenderfer's legacy of archaeology at altitude with attitude. This is Part 1 of a two-part symposium.

**[11] Symposium · NEW INSIGHTS INTO THE TRANSITION FROM THE LATE PRECLASSIC TO THE EARLY CLASSIC IN THE CENTRAL MAYA LOWLANDS**

By the end of the Preclassic period (first to third century CE), several sites in the Central Maya Lowlands (CML) experienced a decrease in population and, in some cases, large-scale abandonment. Several other sites, however, took advantage of this crisis, evidencing an increase in population and construction activities. These shifts occurred at a time when the state of El Mirador was in decline and the CML were in the process of a major sociopolitical reconfiguration. After this crisis, dubbed the “Preclassic Collapse,” several centers experienced a phase of growth, and we see a trend toward the development of more complex and centralized polities. In this session, we will discuss different aspects of the transition from the Late Preclassic to the Early Classic period. We will focus on political shifts and sociocultural continuities based on recent archaeological investigations and also we will reevaluate the impacts of the demise of El Mirador and its political influence in the CML. Finally, we will discuss the sociocultural changes that occurred in the transition period from the Late Preclassic to the Early Classic in the CML as preconditions for the emergence of the new forms of territorial and sociopolitical organization that define the Classic period.

**[12] Symposium · WHAT HAVE WE LOST: THE HISTORY OF EXCLUSION IN ARCHAEOLOGY**

This session highlights both individual legacies and the effects on the discipline of archaeologists who have been excluded over the past 65 years from the field, including women, Indigenous, BIPOC, and LGBTQ scholars. Recent works in the last few years have documented the effects of harassment on women in the profession; namely, the loss of women in senior positions. This session seeks to broaden this examination and identify scholars outside the mainstream whose work was overlooked, overshadowed, or outright ignored. It seeks papers that highlight individuals who fit this category, as well as those that address the effects of this exclusion on modern archaeological practices. Papers that discuss more inclusive methods for the field while also integrating a historical perspective are also welcome.

**[13] Symposium · PRACTICE OF GOVERNANCE: DISTINCTION, BUREAUCRACY, AND URBANISM IN ANCIENT MESOAMERICA**

Max Weber's methodological individualism combined with rational choice theory has heavily influenced ancient Mesoamerican studies of governance. Although practice theory has been broadly applied to archaeological research, Weber's legacy, which presupposes a concordance between actions, consciousness, motivations, and strategies, still interlocks scholars with the question of how emergent elites legitimized their rule. Recent research in other disciplines has, however, revealed that such an assumption is untenable. Attention should be shifted from the attempts, political strategies, and legitimization of rulers to multifaceted practices and interactions among different social groups in institutions as well as between people and their material culture. Thus, we should examine dynamic negotiations of consensus, cooperation, tensions, contradictions, and conflicts among people in long-term perspectives. This approach leads us to consider processes of governance and how different social segments were articulated with one another in specific cultural and historical contexts. Ultimately, it allows us to reveal how negotiations of power and identities among different groups and individuals resulted in specific political regimes and social changes that shaped the trajectory of early complex societies toward social distinction, bureaucratization, and urbanization. In this symposium we explore approaches that integrate institutional and practice-based perspectives of governance in ancient Mesoamerica.

**[14] Symposium · ANALYZING AND REANALYZING THE CONNECTIVITY BETWEEN THE SOUTHWEST/NORTHWEST AND MESOAMERICA**

A comparison of the Southwest/Northwest and Mesoamerican culture areas reveals an intriguing paradox. Parallels occur in cosmology, iconography, metaphor, and ritual. Despite these parallels, the societies of the two regions remain qualitatively different. In the past, archaeologists have attempted to resolve this paradox by either denying significant connections between the regions or by seeing the SW/NW as the northernmost extension of Mesoamerica. The vast majority of these scholars have been archaeologists working in the SW/NW. More contemporary scholars have sought resolution via a compare-and-contrast analysis of the regions. Such comparisons necessitate approaching the problem from both the SW/NW and Mesoamerica. This session brings together archaeologists from both the SW/NW and Mesoamerica to build an international compare-and-contrast analysis of both regions.

**[15] Symposium · RECENT ADVANCEMENTS IN CAHOKIA RESEARCH**

Over the past decade, a flurry of research projects and initiatives has taken place at the precontact city of Cahokia and its associated monuments, settlements, and landscapes in and near the American Bottom region of Illinois. These projects are diverse,

representing academic research and compliance-based projects driven by various combinations of new research questions and theoretical approaches; the reexamination of previous theories, datasets, and hypotheses; the application of new scientific techniques and analytical methods to field investigations and legacy collections; and collaboration with tribal groups and local communities. The papers in this symposium are a representative sample of these projects and initiatives. We hope that these papers, and the diversity of topics, theoretical perspectives, methods, and motivations that they represent, will continue to shed light on the history of this important place as well as pave the way for future research in the region.

**[16] Symposium · 2021 FRYXELL AWARD SYMPOSIUM: PAPERS IN HONOR OF MARY C. STINER**  
(SPONSORED BY FRYXELL AWARD)

The 2021 Fryxell award for interdisciplinary scholarship is awarded to Mary C. Stiner, Regent's Professor of the University of Arizona. The 2021 Fryxell award is presented in the zoology category thanks to the generous support of the family of the late geologist, Roald Fryxell, and recognizes the interdisciplinary excellence of a scholar who has made significant contributions to American archaeology. This half-day symposium organized as part of the award convenes scholars working in diverse regions and fields to celebrate the multidimensional aspects of Mary Stiner's distinguished and extensive research career by presenting original research that connects to diverse themes in Mary's research program. Mary's research tackles big questions related to hominin subsistence evolution by integrating zooarchaeological, taphonomic, and ecological datasets. She has taken on many of the most important subsistence transitions ranging from the emergence of the hominin foraging niche to the forager-farmer transition. Mary has worked in diverse time periods and geographic regions across the Mediterranean Basin and the Near East. Ultimately, her combined body of research has produced a grand narrative for hominin subsistence evolution through the transition to agriculture.

**[17] Symposium · SMALL ADULTS OR BIG KIDS? EXPLORING ARCHAEOLOGICAL AND BIOARCHAEOLOGICAL APPROACHES TO ADOLESCENCE**

Adolescence is a critical period of the life course, encapsulating biological and social changes as individuals transition from childhood to adulthood. While the archaeology of childhood is a rapidly growing field that has attracted archaeologists and bioarchaeologists alike, the study of adolescence is still largely undeveloped. As a result, there has been little formal discussion on both how this period of life may be biologically or socially defined and the spatial and temporal variability within these definitions. The purpose of this session is to bring together researchers from archaeology and bioarchaeology to explore the meaning and experience of adolescence through the analysis of material culture, historical documents, skeletal remains, isotope analysis, and other lines of evidence. We aim to discuss how we may use this material to investigate the lived experiences of adolescents in the past as well as how our work can further our understanding of past societies more broadly.

**[18] Symposium · BIOMOLECULAR ARCHAEOLOGY OF SECONDARY METABOLITES**

Three decades ago, chemical residue studies experienced a significant push as GC-MS approaches became more common in the analysis of archaeological materials. While Old World scholars focused primarily on primary metabolites—lipids or proteins—in the New World research centered on the alkaloid remains of products like cacao, tobacco, or coca. The detection of the corresponding biomarkers—caffeine, nicotine, and benzoylecgonine—shed new light on artifact-commodity associations, long-distance trade networks, and the dating of ceremonial complexes involving psychoactive plants. More recently, the introduction of LC-MS to the realm of archaeometry broadened the field of action. Metabolomics—the ability to analyze hundreds and thousands instead of a handful of substances—grants a better understanding of the differential impact of decay processes across compounds from a single organism. It also allows to investigate the management and consumption of wild versus domesticated species on the genus level, or the multivariate analysis of residue datasets from larger collections of archaeological materials and human remains. In this symposium, we bring together a series of experts from around the globe who work on the frontiers of biomolecular archaeology and the study of residual secondary metabolites.

**[19] Symposium · ARCHAEOLOGY OF THE CIRCUM-CARIBBEAN INDIGENOUS POPULATIONS: NEW INSIGHTS INTO THEIR LIFEWAYS, MOBILITY, AND INTERACTIONS**

Caribbean archaeology has experienced remarkable growth over the last 30 years, leading the debate on numerous critical issues in archaeology such as colonization, migration, seafaring, identity, subsistence, and human-environment interactions. New theoretical and methodological approaches to reconstruct human ecodynamics, along with an interdisciplinary approach to understand biocultural interactions, have been promoting a general paradigm shift in which the ancient Caribbean is increasingly recognized as a highly diverse and dynamic region. During this symposium, discussions will explore new methodologies, explanatory models, and sustained uncertainties involved with reconstructing the lifeways, movements and interactions of Indigenous people from the Antilles and the circum-Caribbean region in precolonial and early colonial times. Such exchange of ideas among Caribbean colleagues stimulates the integration of research results from a cross-regional perspective, as well as further future interdisciplinary collaborations among researchers and institutions. This symposium will also provide an excellent opportunity to enrich our understanding of the dynamic interactions that took place among Caribbean populations in ancient times.

**[20] Poster Session · EXPERIMENTAL ARCHAEOLOGY AROUND THE WORLD**

**[21] Poster Session · ETHNOGRAPHY AND ETHNOARCHAEOLOGY**

**[22] Poster Session · CLIMATE AND THE ENVIRONMENT**

**[23] Poster Session · ZOOARCHAEOLOGY AND URBAN SOCIETIES**  
(SPONSORED BY ZOOARCHAEOLOGY INTEREST GROUP)

The origins and development of urban societies have been of interest to archaeologists in many different parts of the world since the early twentieth century. The establishment of towns and cities leads to changes in the relationship between the urban environment and the countryside, renegotiations between consumers and producers, and the emergence of new societal roles. Zooarchaeology can reveal how urban residents obtained animal products and how and whether rural residents decided to send particular animal and animal products to market. This poster session, sponsored by the Zooarchaeology Interest Group, engages with this unique

social phenomenon through a diversity of posters with a wide-ranging zooarchaeological focus on the urban environment. The posters in this session will explore how zooarchaeology, from many different analytical approaches, can examine aspects of urban-rural relations in towns and cities. The ultimate goal of this session aims to move discussions of zooarchaeology beyond the single facet of a methodological approach toward robust and integrated interpretations of human behavior in light of urbanism.

**[24] Poster Session · MANAGING THE PAST INTO THE FUTURE: SHOWCASING CULTURAL RESOURCES MANAGEMENT PROJECTS AT US AIR FORCE AND SPACE FORCE INSTALLATIONS**

This session showcases a selection of cultural resources management (CRM) projects that highlight the topics, methods, material assemblages, and chronologies that archaeologists engage with while supporting the US Air Force (USAF) and US Space Force (USSF)'s CRM commitments. Argonne National Laboratory (Argonne) and partner CRM firms assist the Air Force Civil Engineer Center (AFCEC) with supporting the management of diverse cultural resources at many USAF and USSF installations across the country and the world. These resources span human experience from the early peopling of North America to the global tension of the Cold War era and provide unique opportunities to advance compelling topics in archaeological research, management, and conservation. With the great diversity in cultural resources comes a need for wide-ranging expertise and innovation for their management. Argonne archaeologists and partner CRM firms employ the full spectrum of traditional and emerging archaeological techniques. Whether conducting survey and excavations, reconstructing paleoenvironments, generating predictive models, creating 3D models, facilitating government-to-government relations with affiliated Tribes, or developing outreach programs, Argonne and its partners advance best practices while providing essential USAF and USSF mission support.

**[25] Symposium · LANDSCAPES OF MOVEMENT AND PREDATION: INDIGENOUS RESPONSES TO COLONIALISM AND THE ARCHAEOLOGICAL RECORD**

The movement of people across landscapes is often compelled and constrained by displacement, predation, and depopulation that must be understood at multiple scales of time, place, and geopolitics. Strategies that Indigenous people have employed include, among others, voluntary isolation to seek refuge from predatory violence, creating new relationships of trade and alliance, and creating multiethnic communities by incorporating diverse others and reformulating identities. From this perspective, the presenters in this session seek to contribute to the understanding of Indigenous responses to colonialism and how it may be informed by the archaeological record.

**[26] Symposium · ARCHAEOLOGY OF DEATH AND IDENTITY IN FORAGER COMMUNITIES**

This session focuses on how forager communities treat their dead and create a sense of commemoration and belonging in their group. Foragers display significant adaptive variability, from small-scale and highly mobile groups to large, permanent communities, which result in equally complex mortuary practices. This session incorporates research from around the globe to foster theory building and intellectual dialogues exploring mortuary practices among a variety of foraging groups. We are particularly interested in exploring the variability of treatment that co-occurs within groups but also going beyond simple narratives of mortuary practice focusing on the decedent or their group to explore active interrelations between the dead, the mourners, and the community in creating memory, a sense of space, and belonging. In this session, we discuss through case studies how to reconstruct different stages of funeral rituals using a wide range of archaeological methods and explore their social significance in a contextualized manner.

**[27] Symposium · ARCHAEOLOGY AND INTERPRETATION AT EVERGREEN PLANTATION, ST. JOHN THE BAPTIST PARISH, LOUISIANA**

Evergreen Plantation is a National Historic Landmark consisting of almost 40 different buildings, including 22 preserved and intact structures used by the free and enslaved until the mid-20th century. These quarters have never been moved and the area has not been significantly impacted by modern development, and consequently, the site contains remarkable potential for studying the lived experiences of household dating back to AD 1800 and up through 1950. This symposium presents findings and interpretations from the first and second seasons of work at Evergreen and highlights the long history of research at Evergreen, as well as its future potential.

**[28] General Session · RECENT RESEARCH IN NORTHERN NORTH AMERICA**

**[29] General Session · LATE INTERMEDIATE ARCHAEOLOGY IN THE ANDES**

**[30] General Session · ISOTOPIC METHODS, MOBILITY, AND EXCHANGE**

**[31] General Session · DIGITAL ARCHAEOLOGY, DATING, AND DOMESTIC CONTEXTS IN ALASKA**

**[32] General Session · BRONZE AGE ARCHAEOLOGY IN EAST ASIA**

**[33] General Session · ARCHAEOLOGY OF GREENLAND**

**[34] Symposium · MONUMENTALITY IN THE PRECLASSIC NORTHERN MAYA LOWLANDS**

For archaeologists investigating the rise of complex societies, monumental architecture remains important as a marker of social identity, shared culture, and heritage. Recent work in the Northern Maya Lowlands has revealed a diverse array of monumental architectural forms that date to the Preclassic period, including E-groups, triadic groups, colossal acropolises, and ballcourts. Yet the presence and absence of these monumental types is quite variable across Yucatan, and even areas that share monumental types may feature a host of differential variables, including construction methods, placement within a broader site plan, and degree of exclusivity and ingress. With the existence and prevalence of Preclassic monumental architecture now well-established in the Northern Maya Lowlands, it is now time to link monumental architecture of the region to broader cultural processes. For this session, participants aim to identify the timing of monument construction, explain the diversity in monument forms across time and space,

and relate monumental construction to social phenomena such as religious practice, inequality, environmental exploitation, and interaction with other Mesoamerican cultures.

**[35] General Session · ETHNOGRAPHY, ETHNOHISTORY, AND SACRED NARRATIVES**

**[36] Forum · EXPLORING DATA STEWARDSHIP WITH TDAR, OPEN CONTEXT, AND DINAA**

Collecting and analyzing large datasets generated during archaeological investigations is commonplace for CRM, academic, federal, and state archaeologists alike. However, the volume of data collected is ultimately out of proportion with both the smaller amount preserved and the even smaller amount later reused; thus, this forum covers these later parts of the data lifecycle. In this forum, professionals from data management systems Open Context and tDAR, and the Digital Index of North American Archaeology (DINAA) project, explain how their systems facilitate the preservation, access, and reuse of irreplaceable archaeological data. Topics in the forum focus on the importance of preserving our digital cultural heritage (theoretical), online tools offered by these organizations (technical), and case studies (practice) to highlight the breadth of data preservation, management, and reuse. Forum participants will highlight how these organizations complement one another and are working collectively to promote both the FAIR (findable, accessible, interoperable, and reusable) and CARE (collective benefit, authority to control, responsibility, and ethics) principles in archaeology. Finally, the panel will discuss our collective experiences from the past decade, and call for more support for data stewardship with the possibility of establishing “data stewardship funds” to support the preservation of digital archaeological resources.

**[37] Forum · SPEED-MENTORING "OFFICE HOURS"**

*(SPONSORED BY WOMEN IN ARCHAEOLOGY INTEREST GROUP)*

Our archaeological friends and colleagues may not always be able to answer questions about grant-writing, interviewing, different kinds of careers in archaeology, fellowships, dealing with nonprofits, or doing community outreach. In this session, several volunteer mentors will be available to meet with individuals or very small groups to answer your specific questions on these and other issues. So far, mentors with experience in the American Southwest, South Asia, Central America, Oceania, and New England have volunteered; they also have experience with museum careers, careers in CRM, NAGPRA regulations, NSF grants, AAUW pre/postdoc fellowships, and other topics. Mentoring sessions will begin and end promptly every 20 minutes during the two-hour session. Follow-up e-mail contact between mentors and attendees is up to the individuals involved; mentors may also provide possible referrals to another scholar. All SAA members are welcome.

**[38] Poster Session · PALEODIET AND FOODWAYS**

**[39] Poster Session · ARCHAEOOMETRY**

**[40] Poster Session · QUANTITATIVE MODELING OF ARCHAEOLOGICAL DATA**

*(SPONSORED BY QUANTITATIVE METHODS & STATISTICAL COMPUTING INTEREST GROUP [QUANTARCH])*

Quantitative data modeling is fundamental to archaeological inquiry. This type of modeling transcends material types, cultural phases, methodological approaches, and research questions to evaluate how well archaeological observations support theoretical expectations. The purpose of this symposium is to exhibit the range of analytical techniques that are currently being used to model data and evaluate archaeological hypotheses and theories. Symposium participants share an interest in testing archaeological hypotheses regarding cultural variability by harnessing a wide range of analytical modeling methods derived from computational, mathematical, spatial, statistical, and graphical approaches. In their presentations, they will address archaeological questions across diverse subdisciplines, geographical regions, and temporal ranges. All participants of the Society for American Archaeology meeting are encouraged to attend this symposium, as it will give them the chance to become aware of analytical advancements potentially applicable to their individual specializations.

**[41] Poster Session · ARCHAEOLOGIES OF PRACTICE: RESEARCH IN HONOR OF JUDITH A. HABICHT-MAUCHE**

This symposium honors Dr. Judith Habicht-Mauche's substantial accomplishments and enduring legacy within the field of archaeology. Drawing on feminist, Marxist, and situated learning theories to interpret ceramic technology, her scholarly insights have revealed important aspects of identity and community formation in the American Southwest and Plains. In addition, her innovative application of lead-isotope analysis to southwestern glaze-painted pottery serves as a methodological model with broad applicability. Widely respected by her peers, Dr. Habicht-Mauche's accolades include some of the most prestigious awards and honors bestowed by the Society for American Archaeology (SAA), including the Award for Excellence in Archaeological Analysis (2009), the Outstanding Poster Award (1997), and the inaugural Dissertation Award (1988). Dr. Habicht-Mauche has also excelled as a teacher of archaeological method and theory, as well as a mentor to young scholars, and was nominated for the Phi Beta Kappa Northern California Association Excellence in Teaching Award (1995). Other archaeologists have come to know and respect Dr. Habicht-Mauche through her SAA committee service. In this session, current and former students and colleagues present work inspired by and celebrating Dr. Habicht-Mauche's decades of path-breaking research and devoted mentorship, as well as her dutiful service to the field.

**[42] Symposium · TIES THAT BIND: CREATING COMMUNITY IN EARLY IRELAND**

Communities are created through repeated engagement with others. Although people interact in numerous settings, archaeological studies often rely on residential patterns as the key unit of analysis, sorting societies into categories such as dispersed and nucleated. This approach limits our understanding of the variety of social relationships and collective identities animating human communities. In late prehistoric and early historic Ireland, the majority of people occupied dispersed individual farmsteads, even after the development and growth of towns. Without the daily interaction implied by shared residence, how did the early Irish actively create and maintain their social ties? The papers in this session explore the ways in which communities — at the local, regional, and international scales — were constituted from the Iron Age through the Later Middle Ages (c. 500 BCE to 1500 CE). Key places for interaction among community members included ceremonial sites and cemeteries, as well as markets and towns. This broader

perspective highlights the complexity of community relations in early Irish society. While many community bonds supported subsistence and economic activities, they also (often simultaneously) fulfilled familial, religious, and/or emotional needs.

#### **[43] Lightning Round · TOWARD AN ARCHAEOLOGY OF PASTORALIST COMMUNITIES**

There has been a florescence of work on the archaeology of pastoralist societies and economies, much of which has focused on macro-scale social dynamics: what are overall mobility strategies, and how do pastoralists interact with the landscape and other groups? Although the literature acknowledges that from year to year, there is potential for variation in social groupings and mobility patterns (e.g., Frachetti 2012), there has been little investigation of the internal dynamics that would have driven this variation. Meanwhile, it has been over 30 years since Ashmore and Wilk (1988) argued that understanding the interpersonal relationships within and between households and communities is crucial to understanding large-scale social dynamics and processes. While this perspective has become widely accepted in many branches of archaeology, it has been slower to catch on in the archaeology of pastoralism. Recently, Wright (2016) argued that ethnographic analogy can help us understand pastoralist household organization in Mongolia. Although this argument is an important first step, it risks the familiar pitfalls of analogies. Therefore, this session asks participants to consider additional or alternative evidence that archaeologists might use to understand the internal dynamics of pastoralist societies. Can we build a robust archaeology of pastoralist communities?

#### **[44] Symposium · CURRENT HISTORICAL ARCHAEOLOGY AND HERITAGE IN THE CARIBBEAN**

The growing attention to contemporaneous problems in Historical Archaeology has shifted the field into more informative practices that involve local communities and scholars. The Caribbean is a significant region with a heterogeneous population affected by colonialism in different ways, reproducing historically significant problems that have been explored through archaeology. Some of these problems are associated for instance with the slavery trade and its legacy, colonialism, gender, foodways, and political violence. Approaching these issues from an interdisciplinary archaeological lens challenges master narratives and enables the construction of new emancipatory and alternative narratives resulting from a fragmentary local heritage that continues to impact contemporary communities. Here, we intend to debate about the diversity in the current Caribbean historical archaeological arena, including local and non-local scholars contributing to the understanding of the past, from the early colonial process to the contemporary past, and its significance in the present.

#### **[45] Symposium · INCLUSION, EXPANSION, AND HUMILITY IN NORTH AMERICAN ARCHAEOLOGY: PAPERS IN HONOR OF KENT G. LIGHTFOOT, PART 1**

In a dynamic near half-century career of insight, engagement, and instruction, Kent G. Lightfoot has transformed North American archaeology through his innovative ideas, robust collaborations, thoughtful field projects, and mentoring of numerous students. This session consists of archaeologists profoundly influenced by Lightfoot; they present papers emphasizing the multifarious ways he impacted—and continues to impact—their approaches to archaeological inquiry, anthropological engagement, Indigenous issues, and professionalism. The papers are highly varied but intersect with four primary themes: (1) negotiations of intercultural entanglements in pluralistic settings with attention to resilience and persistence; (2) transformations of temporal and spatial archaeological dimensions as well as theoretical and methodological innovations; (3) engagement with contemporary people and issues; and (4) leading by example with honor, humor, and humility. These ideas and the evolving directions in which the presenters pursue their projects form an inextricable part of Lightfoot's legacy. They reflect the remarkable depth, breadth, and growth in his career, despite his unwavering stylistic devotion to Hawaiian shirts.

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

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

#### **[47] Symposium · CLIMATIC INFLUENCES ON DIET, DEMOGRAPHY, AND CONFLICT**

Climate change alters the severity of weather, experienced rainfall, temperature, seasonality, floral and faunal distributions, and much more. Increasingly, researchers around the world are documenting the multifaceted ways in which climate change structures patterns in human diets, demography, and conflict. Further, scholars are showing how each of these aspects of human life can be interconnected, with demography, diet, and conflict driving changes in each other. Critically, many studies of climate change focus on the last century when conditions were relatively stable. Modern projections predict increasingly volatile conditions in the near-future, making archaeological investigations of past climate change when conditions were less stable all the more salient. This session engages with the complex dynamics of how climate change influences past diets, demography, and conflict with the goal of identifying new methods for quantifying key factors, making theoretically informed predictions of behavioral responses, and identifying markers of changing behavior in the archaeological record. We intend for this session to display recent quantitative approaches and critical findings.

#### **[48] Symposium · THE MID-SIXTH-CENTURY CLIMATIC CRISIS AND SIXTH- TO SEVENTH-CENTURY AFTERMATH IN MESOAMERICA AND BEYOND**

Along with other worldwide crises that disturbed cultural conditions during the first millennium CE, 536 CE and subsequent decades following ranks among the most powerful. It appears to be the product of at least three large volcanic eruptions and perhaps other contributing circumstances such as changes in solar radiation, multi-year atmospheric dust clouds, and growing influence of human populations on global energy balances through greenhouse gas emissions. Thanks to new research results from volcanology,

settlement patterns, lake bottom sediments, dendrochronology, and epigraphy of Maya Classic period writing, new visions of the aftermath of the crisis are appearing. Of particular importance are the effects of the Ilopango-TBC, Nicaragua eruption and the explosive expansion of the role played by the Kaan Dynasty in formulating a hegemonic empire across the central and southern Maya Lowlands. Other Mesoamerica-wide impacts may be traceable to the appearance and/or strengthening of the Feathered Serpent Monastic Military Cult, the formulation of a truly international commercial network around the Gulf of Mexico, and deepening of already evident efforts to engineer water management for public health and intensive wetland agriculture. This symposium attempts to open as many venues of insight as possible into the emergence of this Classic period pattern.

**[49] Symposium · SPACES IN BETWEEN: COMMUNITIES AND COUNTERPUBLICS IN THE AMERICAS**

Archaeologists often use the dichotomy of public versus private to illuminate different scales of social processes in past societies. Building on previous work by archaeologists of the Americas, we recognize that many spaces and activities do not fit into the opposing categories of public and private but rather create overlapping, intermediate communities. Critics of Jürgen Habermas's influential theory of the public sphere, like Nancy Fraser, argue that what we call "the public" is made up of multiple publics, including counterpublics that resist and transform state or dominant structures. Scholars also push back against Habermas's private/public dichotomy, his glossing-over of power relations, and his focus on rational discourse at the expense of other mechanisms of social change, such as bodily practice. We believe debates about the public sphere can inform our studies of past societies, particularly when we consider physical spaces and ritual performances, which form and transform communities and power relations. In this symposium, we consider how "in-between" (neither public nor private) spaces for performances were created and used by communities and counterpublics. Taking a comparative approach, we address the roles that such spaces played in societies across the Americas, before and after colonization.

**[50] Symposium · MAKING GROUND: THE ARCHAEOLOGY OF WASTE LANDSCAPES**

This session showcases research on landscapes created from the mass deposition of waste, trash, and rubble. Such sites might include large spoil heaps, "dark earth" deposits, land-reclamations, landfills, and landscape engineering projects. While sometimes considered useless "wastelands," such novel or modified landscapes may not remain denigrated or unused for long, and can spark off new uses and inhabitation, even to the extent that their anthropogenic origins become forgotten. While archaeologists and discard studies scholars have long mined refuse as a rich source of data on many aspects of human life, seemingly little archaeological investigation has examined the origins and uses of waste-made terrain as a unified subject in its own right. This session calls for contributions from any time period, region, or specialism investigating waste-generated landscapes. For example: Site-formation processes where waste materials create novel landscapes or transform existing ones; How such landscapes offer new uses for humans and nonhumans; How layers of waste, rubble, or occupation debris may form a platform on which further occupation takes place, How materials move between being "wasted" and valued in these landscapes; How seemingly "natural" landscapes may have an ultimately anthropogenic origin; The role of these landscapes in debates on the Anthropocene.

**[51] Symposium · ARCHAEOLOGY WITH ALTITUDE PART 2: PAPERS IN HONOR OF MARK ALDENDERFER**

Dr. Mark Aldenderfer is recently retired emeritus professor at UC Merced. Over four decades, his scholarship has paved the way for advances in the archaeology of montane environments, quantitative methods, and geographic information systems. He has made theoretical contributions to the anthropology of hunter-gatherers, agricultural origins, power, and religion with case studies drawn from fieldwork in the Andes, Himalayas, Ethiopian highlands, and Mesoamerica. His scholarship appears in over 200 peer-reviewed articles, books, book chapters, and encyclopedia entries, and he has held editorial posts with *Latin American Antiquity*, *Current Anthropology*, and *Science Advances*. After earning his PhD from Penn State in 1977, he held positions at Northwestern, UC Santa Barbara, and the University of Arizona where he trained, mentored, and inspired many students who have extended his work in various theoretical, methodological, and geographic domains. These papers honor Dr. Aldenderfer's legacy of archaeology at altitude with attitude. This is Part 2 of a two-session symposium.

**[52] Symposium · EXPLORING THE ORIGINS OF VILLAGE LIFEWAYS IN THE EASTERN PLAINS: RECENT DATA FROM JOY CREEK MAJOR (13PM7), NORTHWEST IOWA**

Exploration of potential connections between northwest Iowa Mill Creek sites in the eastern Plains and Cahokia offers intriguing opportunities for understanding interactions involved with the emergence of fortified villages following corn-centered agricultural subsistence-settlement adaptations. The Joy Creek Major site (13PM7), while badly damaged by flooding, provides ready access to the exposed basal portions of dozens of large Mill Creek features which have been archaeologically documented and sampled. This symposium builds on extensive recent site context and artifact analyses including gradiometry, geoarchaeological coring, drone-based thermography and photogrammetry, ceramic analyses including temper petrography and pXRF, lithics, fauna, and paleoethnobotany to consider 13PM7 within the Mill Creek culture (Initial variant of the Middle Missouri Tradition) Big Sioux phase. A suite of new AMS radiocarbon results for assays on annual plants from 13PM7 and related northwest Iowa sites contextualize emerging eastern Plains village lifeways and frame potential Cahokia interactions.

**[53] Symposium · A LIFETIME OF SCHOLARSHIP ON PLAZA PLANS, BURIALS, AND CACHES: A SESSION IN HONOR OF MARSHALL BECKER**

For six decades Marshall Becker has contributed to our understanding of ancient cultures from many areas of the Americas, as well as Europe, through more than 300 articles. His scholarship has moved from kilns, to coco, to wampum, to ancient dentistry, and to cremation burials. Becker's work has taught us to question what burials have meant in the past as well as the role of offerings, and the overlap between the two. He has written on many cultures of the Americas including the Maya, the Lenape, the Penobscot, the Susquehannock, and the Seneca, as well as studied mortuary remains from English, Italian, Greek, and Turkish sites. Within Maya studies he is particularly known for his research on plaza plans in the Maya lowlands and his work on markets, but in North American studies he is an expert on wampum, and in Europe on cremation burials. The speakers in this session will present papers that have been influenced by the great body of scholarship conducted by Marshall Becker over his many decades as an archaeologist.

**[54] Symposium · HOUSEHOLD SIZE, WEALTH, AND INEQUALITY IN THE MAYA LOWLANDS**

Inequality is present in all human societies, but how that inequality developed and persisted for centuries worldwide requires historical or archaeological data. Identifying the degree of inequality (or disparity) within ancient communities can be addressed through a variety of methods. One method to evaluate inequality requires robust settlement data evaluation. Here, we assess household size as a potential reflection of wealth inequality among Classic (250–900 CE) Maya settlements. First, data from both pedestrian and remotely-sensed lidar survey generate house size data. Then, that data can be used to calculate Gini coefficients and Lorenz curves, which provide measures of the variation within the house size datasets. All Gini coefficients range from 0–1, where 0 reflects perfect equality and 1 indicates perfect inequality. Both area (m<sup>2</sup>) and volume (m<sup>3</sup>) provide different, but complementary, metrics to calculate the Gini coefficient and investigate variation in household wealth inequality among Classic Maya Lowland settlements. Proposed mechanisms that generate inequality include the intergenerational transmission of wealth and differential access to resources; however, addressing these and other mechanisms for how inequality develops, persists, and was maintained in the past provides insight into similar processes of systemic inequality worldwide.

**[55] Symposium · ABOUT FACE: PORTRAITURE IN THE ANCIENT AMERICAS**

What is a portrait? In this session we will explore this question for the ancient Americas, seeking to shed preconceived Western notions and instead examine the commonalities and varieties of portraying individuals within indigenous pre-contact traditions. There are a number of compelling issues to be addressed. We might consider how an individual's likeness is made distinctive within a system where conventionalized representations of human actors are the norm. What is ideal beauty, and how is it expressed? In what ways does writing, or its absence, affect portraiture? When the line between humans and supernaturals is indistinct, we might ask if true portraits can be recognized. How does status affect the nature of portraiture? Gender? Ethnicity? Does caricature exist? Finally, we could consider what the absence of portraiture tells us about a culture. While realistic portraiture might not have been a priority in the ancient Americas, artists and their patrons did seek to memorialize individuals in remarkably diverse ways.

**[56] Symposium · STEWARDSHIP OF ARCHAEOLOGY ON MILITARY LANDS**

*(SPONSORED BY MILITARY ARCHAEOLOGICAL RESOURCES STEWARDSHIP)*

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

**[57] General Session · PALEOINDIAN ARCHAEOLOGY IN THE AMERICAS****[58] Forum · ARCHAEOLOGICAL ETHICS IN THE PAST, PRESENT, AND FUTURE: LESSONS FROM THE SAA ETHICS BOWL**

The Ethics Bowl is a time-honored tradition at the SAA annual meetings. It is a space where students and audience members critically and creatively engage with diverse ethical issues that face the practice of archaeology today. Each year, student teams come up with innovative arguments, considerations, and solutions that move the discipline forward. The Ethics Bowl has become an active space where important ethical conversations are raised, leading to productive discussions that extend beyond the conference and into the realm of practice. This year, the SAA Committee on Ethics, the Register of Professional Archaeologists, and the SAA Ethics Revision Task Force III invite practicing and professional archaeologists to take part in a discussion led by former contestants, judges, and supporters about lessons learned from the SAA Ethics Bowl through the years. The forum will be a conversation during which archaeologists of all sectors can confer on past, current, and future trends in the ethics of our discipline. We will address the challenges of navigating ethics in practice as well as ideas about what role our core ethical principles may play in today's changing world. It will also be an opportunity to celebrate the outstanding achievements of the student teams.

**[59] General Session · CLASSIC MAYA: CERAMICS, ICONOGRAPHY, AND DYES****[60] General Session · ARCHAEOLOGICAL THEORY, HISTORY, AND TAPHONOMY****[61] General Session · ARCHAEOLOGY OF NORTHERN AND WESTERN EUROPE****[62] General Session · ANCIENT MAYA LANDSCAPES AND ENVIRONMENTS****[63] General Session · ARCHAEOLOGICAL STUDIES OF COASTAL EXPLOITATION AND HABITATION****[64] General Session · ARCHAEOLOGY AND MODERN GLOBAL ISSUES****[65] Poster Session · RECENT RESEARCH IN EASTERN NORTH AMERICA****[66] Poster Session · CULTURAL RESOURCE MANAGEMENT (CRM) ACROSS NORTH AMERICA****[67] Poster Session · LIFE ON THE EDGE: MULTI-REGIONAL EXPLORATIONS OF COASTAL AND ISLAND ARCHAEOLOGY****[68] Poster Session · ZOOARCHAEOLOGY****[69] Poster Session · ARCHAEOLOGY OF GENDER AND CHILDHOOD**

**[70] Poster Session · NEW DEVELOPMENTS IN ANALYSIS OF FIBER/PERISHABLES AND ASSOCIATED ARTIFACTS (SPONSORED BY FIBER/PERISHABLES INTEREST GROUP (FPIG))**

The social, ecological, economic, political, and ideological importance of fiber/perishable technologies cannot be overstated. The innovations in this area have been important in the sociocultural development and success of past civilizations. Fiber/perishables can provide sensitive information on production communities and human interactions, and they provide unique opportunities for archaeometry and other analytic techniques, including experimental archaeology. This poster session will present new research in the study of fiber/perishables and other types of artifacts that create or rely on worked fibrous elements, with a focus on new, less destructive methods of analyzing these materials. Sponsored by the Fiber/Perishables Interest Group (FPIG).

**[71] Poster Session · ADVANCES IN ARCHAEOLOGICAL SCIENCE IN TRANSYLVANIA**

Located in the heart of modern-day Romania, the region of Transylvania has long been a key economic and political crossroads in Europe. From the high peaks of the Carpathian and Apuseni Mountains to the rolling hills of the central plateau, Transylvania is a geographic and cultural nexus that is home to a diversity of ecological and mineral resources, including the riverine and overland networks that linked central and eastern Europe both historically and in prehistory. Over the past decade, there has been a florescence of archaeological activity in the region, as a result of highway construction, heritage legislation, and government sponsored programs of archaeological research. A key aspect of these recent projects is their growing reliance on new techniques in archaeological science to interpret this rich archaeological record. This session brings together participants drawing from multiple new methods—including remote sensing, GIS, Bayesian modelling, bioarchaeology, and isotopic analyses of diet and mobility—to highlight how recent archaeological techniques are transforming our understanding of the Transylvanian past in this pivotal region.

**[72] Poster Session · PUBLISHED ARCHAEOLOGICAL SITE NUMBERS AS BIG DATA CONNECTIONS: BUILDING AND ANALYZING THE DIGITAL INDEX OF NORTH AMERICAN ARCHAEOLOGY (DINAA) LINKING SITES AND LITERATURE PROJECT**

This symposium presents results of text mining decades worth of numerous archaeological journals to examine the potential for archaeological site numbers to serve as important organizational attributes for big data archaeology, to powerfully connect primary research data with professional literature and enhance the practice of archaeology in primary research, efficient collections reuse, enhanced predictive modeling, and public engagement. The Digital Index of North American Archaeology (DINAA) is a free and open informatics hub and gazetteer of archaeological sites, containing almost one million archaeological site records, organized with attributes related to cultures, site types, temporal periods, diagnostic artifacts, and other sociocultural and scientific information. The DINAA Linking Sites and Literature (LSL) project allows users to explore published literature that contain archaeological site numbers that become queryable and linked through the DINAA LSL. Sites and their citations in literature can be associated with geographic regions (often to the county level or finer), and archaeological concepts represented in the main DINAA dataset. New features of JSTOR's scholarly literature database permit open and reproducible text mining of available holdings through their Constellate portal, using Python and Jupyter Notebook coding environments; the potential impacts of these new tools in archaeology will be evaluated and discussed.

**[73] Symposium · RELIGIÓN, SOCIEDAD Y TECNOLOGÍA MATERIALIZADOS EN ATZOMPA, OAXACA**

En la presente sesión se muestran trabajos referentes a los avances en el conocimiento de la sociedad zapoteca que habitó el Conjunto Monumental de Atzompa (Monte Albán, Oaxaca) hacia el periodo clásico tardío (650–950 dC). Los estudios que se presentan enmarcan intereses científicos puntuales, como el desarrollo de estudios de la cerámica, arquitectura e iconografía y el manejo del agua. Se presentan desde perspectivas comparativas propiciadas por el registro y diagnóstico arqueológico, y mediante el empleo de nuevas tecnologías. Estos temas de estudio nos han permitido abordar aspectos de la cosmovisión y religión; el poder; la arquitectura de sus unidades residenciales, así como elementos del desarrollo tecnológico.

**[74] General Session · EARLY AND FORMATIVE PERIOD ARCHAEOLOGY IN THE ANDES**

**[75] Forum · THE SAA HAS A NEW HUMAN REMAINS STATEMENT . . . WHAT'S NEXT?**

Having adopted a new "Statement Concerning the Treatment of Human Remains," we ask ourselves "what's next?" The forum will discuss the issues surrounding work with human remains that could not be addressed in the statement. The outstanding issues are listed in a follow-up report (<https://documents.saa.org/container/docs/default-source/catf/cnar-repat-report-on-statement-final-edition.pdf>) including SAA policies on conferences and publications, DNA research, data sovereignty, best practices, training, and education. The forum will focus on defining the outstanding issues and proposing actions that can be taken to address them. The panel is composed of individuals who assisted with the drafting of the statement and considered these questions during the statement rewrite. Audience members are invited to participate in the conversation.

**[76] General Session · ARCHAEOLOGICAL STUDIES OF HUNTER-GATHERERS**

**[77] General Session · HISTORIC ARCHAEOLOGY**

**[78] General Session · DIGITAL ARCHAEOLOGY**

**[79] Symposium · VISIONS OF DEEP TIME: TOWARD A MORE INTERPRETIVE FRAME OF ANTHROPOLOGICAL ARCHAEOLOGY IN THE EARLY AMERICAS**

Twenty-first-century research on the Peopling of the Americas has seen incredible progress toward establishing the antiquity of human presence. While this is critical to the larger picture, chronological studies alone cannot tell the histories from which anthropology seeks to derive meaning and ontological understanding. Research into the initial settlement of the Americas through formative periods has not afforded the same liberty of scholarly insights about lifestyle expressions, personal motivations, and social rewards that contextualize later cultural periods. Instead, utilitarian and "practical" motivations are the default that has excluded the examination of diverse patterns of human agency in the data of the early Americas. We seek to more closely link the cultural heritage of the Americas into a continuum, rather than denying earlier cultures the same lens of enterprise as descendant

communities that developed agriculture, state-level politics, writing, and intentional landscape engineering. The seeds of these accomplishments germinated within the social context of ancestors who also modified pristine environments into human landscapes long before. Can an examination of a more experiential framework enhance our understanding of their lives? We present social theories regarding early Indigenous communities of the Americas—their human ecology, art, ritual, knowledge transmission, design principles, and ethno-science.

**[80] Symposium · POST-ABOLITION LABOR AND COMMUNITIES: A GLOBAL VIEW FROM THE PLANTATION AND BEYOND**

Slave labor and plantation economics are among historical archaeology's primary topics. In recent years, growing attention has been given to nineteenth-century post-abolition and post-emancipation labor and communities, particularly those associated with (former) plantations in the United States and the Caribbean. This session considers post-abolition labor from a broader global perspective. Attending to post-abolition labor and societies across different geographies, this session seeks to think comparatively about the reorientations of labor, colonial and postcolonial economies, and new types of communities that emerged in the aftermath of different moments of modern abolition. How does the experience of post-abolition labor compare between the Indian Ocean and the Caribbean, between South America and West Africa? How can we think of the similarities of experience between these areas, as well as the vast differences? In what ways does thinking beyond the confines of an individual European empire expand or shift the conversation? This session is particularly concerned with the relationship of post-abolition economies and labor to social networks and communities (including the rise of indentured labor). That is, looking beyond the restructuring of labor and markets that abolition and emancipation manifested and emphasizing the manner in which this restructuring remade communities, places, and social life.

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

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

**[82] Symposium · NAVIGATING CULTURE CHANGE: STUDIES IN THE (RE)CREATION OF NEW WORLDS**

Researchers studying past and present peoples have long known that culture change is inevitable. Particularly in hindsight, some of these major permutations have been designated as "collapse," with most members of society experiencing significant and permanent negative impacts and well-established traditions being abandoned for reasons other than personal preferences. Such focus on collapse often emphasizes sociopolitical structures, and "top-down" perspectives on social change. However, major transformations to cosmology, practices, and ways of life need not always be negative. Rather there is often much diversity in social processes that are more challenging, if not impossible, to evaluate from an outsider's perspective. Such outcomes may be intimately tied to an individual- or group-level identity. People are not passive recipients of major or minor changes, but instead may be actively driving change themselves—innovating, collaborating, and/or navigating resources to (re)create their own new world. Case studies from various geographic and chronological contexts, as well as larger theoretical perspectives, demonstrate that terms such as "collapse" or "transformation" hide nuanced individual and shared cultural responses to significant cultural changes that have impacted people throughout time.

**[83] Symposium · LITHIC RAW MATERIALS, TOOLS, AND TECHNOLOGICAL ORGANIZATION: PAPERS IN HONOR OF WILLIAM ANDREFSKY JR.**

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

**[84] Symposium · BORDERLANDS OF THE ANDES: PEOPLES, POLITIES, AND PASTS OF THE CHAUPIYUNGA AND SELVA ALTA**

Separating the central Andean cordillera from the lower-lying coastal plains to the west and the dense jungles to the east, the chaupiyunga and selva alta landscapes form important geographic boundaries and offer ideal lenses through which archaeologists can study borderlands. Within the Andes, these were dynamic spaces where a panoply of interactions and interests collided, creating new and unique identities and traditions. This session brings together a host of scholars with papers that shine light on the rich record of peoples, polities, and pasts bundled within the chaupiyunga and selva alta borderlands of the Andes. Papers take a variety of approaches to understanding these regions: settlement patterns, ethnicity, network analyses, ceramic traditions, bioarchaeological analyses, architectural traditions, and historical documentation. The goal of the session is to provide a venue through which a variety of voices can discuss the deep pasts of several chaupiyunga and selva alta landscapes, outline directions for future research, and even interrogate the utility of describing these regions as borderlands.

**[85] Symposium · ZOOARCHAEOLOGY: BEYOND HUMAN SUBSISTENCE***(SPONSORED BY ZOOARCHAEOLOGY INTEREST GROUP)*

Zooarchaeological methods are powerful tools for understanding subsistence strategies of past humans and their ancestors and studies of faunal remains from archaeological sites play a key role in answering questions about past human diets. Zooarchaeology also has the potential to offer insights into numerous aspects of human lifeways beyond subsistence. For example, faunal remains can be used in dating methods, to reconstruct past environments, to provide important evidence of taphonomic and site formation processes, and to explore domestication, trade, or movement of human populations. Animal remains were used to make tools and art, aiding interpretations of social, cultural, and economic structures. Resource conservation, preservation, and management, biodiversity studies, modeling climate change, and informing policymakers are among the many practical applications of zooarchaeological research. This session seeks to present a diverse set of zooarchaeological research, from any level of study, using any methodological approach, from any geographical region or temporal period that goes beyond asking "what did they eat?" to investigate different, or additional, aspects of the human past.

**[86] Symposium · BEFORE THE BORDERS: RECONSIDERING SOUTHERN MOGOLLON CONNECTIONS**

Twenty-first-century research has brought new attention to the dynamic nature of the Southern Mogollon region, which included all areas and phases of the Mimbres, the southern Jornada Mogollon area into west Texas, the eastern half of southeast Arizona, the eastern edge of Sonora, and most of Chihuahua almost to the border with Durango. Evidence reveals that rather than remaining static and peripheral to major developments in neighboring regions, southern Mogollon peoples maintained extensive interactions within and beyond a broad cultural sphere and were important innovators and early adopters of key traits that defined the Southwest/Northwest by the time of Spanish colonization, even though they themselves no longer occupied their ancestral lands and had become unrecognizable in the archaeological record. Within this region trends in one area can be representative of connections elsewhere, and despite differences in material culture, shared traditions spread across supposedly cultural boundaries. This session investigates these shared traditions and cultural innovations starting with the arrival of ceramics in the early centuries of the first millennium CE through substantial depopulation of this region ca. 1450 CE using a transborder approach with the objective to redefine how archaeologists identify and interpret historical processes beyond traditional boundaries.

**[87] Symposium · JOHN WAYNE JANUSEK AND THE TIWANAKU REVOLUTION**

John Janusek's career forged a new way of studying Tiwanaku and its ancestors. This session explores the transformation of Tiwanaku scholarship over the past 25 years and considers how John's work has inspired a deep rethinking of the emergence of the altiplano city and cross-cultural dynamics. This session is built around two central themes. First, John's research into "households" transformed our thinking about early forms of Andean urbanism. His work at Tiwanaku explored the relationship of bounded residential compounds, specialization, and the production of social identities. At Khonkho Wankane, his team explored early Andean "proto-urbanism," while questioning the traditional concepts of social complexity. The second theme considers the role of "materiality and ritual" in forging human relations across the landscape. John demonstrated how earthly elements and "telluric techné" became a key medium for groups to negotiate their identities vis-à-vis others. He refocused our attention to monoliths and places in an Andean political ecology of mountains, celestial movements, and competing humans. We encourage participants to bring rich datasets (either old or new) to this session into the households, materiality, and ritual of Andean worlds, and to reflect on John's place in an ongoing Tiwanaku scholarly revolution.

**[88] Hybrid Symposium · EL NIÑO AND THE ARCHAEOLOGY OF RESILIENCE ON THE PERUVIAN COAST***(SPONSORED BY GEOARCHAEOLOGY INTEREST GROUP)*

El Niño is a complex, recurrent climatic perturbation that affects much of the Pacific Basin and beyond. As part of El Niño/Southern Oscillation (ENSO), multiple varieties of El Niño are now recognized, each with different effects on the Peruvian coast. Archaeologists have investigated and reported on El Niño for over 50 years, but until recently most studies focused on the negative aspects of classic Eastern Pacific events: El Niño as unmitigated disaster. However, El Niño intersects with both cultural vulnerability and resilience. Recent studies have uncovered pre-European technological and possibly behavioral adaptations that increased the resilience of societies that experienced these events. In this session, archaeologists and anthropologists studying ancient Peruvian coastal cultures consider evidence for cultural responses to El Niño's challenges and opportunities and their role in social maintenance and change.

**[89] Symposium · ALTERED STATES OF CONSCIOUSNESS: RECENT RESEARCH ON MIND-ALTERING SUBSTANCES AND PRACTICES IN THE ANCIENT AMERICAS**

The past few years have seen an explosion of interest in the therapeutic and ritual use of mind-altering substances as scholars and practitioners recognize that the controlled use of many of these materials can have beneficial physical, mental, and social outcomes. The increased attention is not only to the physiological and psychological effects of psychoactive substances, but importantly to "set and setting"; that is, to the contexts in which these materials are prepared and used and to how the altered states of consciousness they generate are evaluated and made sense of. Given that the use of a wide variety of plants with psychoactive properties is well-documented to date back thousands of years, archaeology can make a useful contribution to current conversations about the place of mind-altering substances and altered states of consciousness in society and culture. This session brings together scholars investigating altered states of consciousness in the past from a multiplicity of perspectives. We present current archaeological research that addresses questions about what is used; how, where, why, and by whom psychoactive substances and practices were used; and especially the benefits that accrued to individuals and groups participating in the preparation and consumption of these substances.

**[90] Poster Session · THE PALEOLITHIC IN AFRICA****[91] Poster Session · BIOARCHAEOLOGY AND MORTUARY ANALYSIS IN THE CLASSIC MAYA WORLD****[92] Poster Session · ARCHAEOLOGY IN THE ANDES**

**[93] Poster Session · CONFLICT, WAR, AND VIOLENCE****[94] Poster Session · CAVES AND ROCKSHELTERS****[95] Poster Session · SET IN STONE: STORIES TOLD BY LITHIC ANALYSES****[96] Poster Session · RECENT RESEARCH ON THE MAYA****[97] Symposium · FROM CLOVIS TO CODY: EAST MEETS WEST**

Paleoindian technologies such as Clovis, Folsom, Agate Basin, Cody, and Dalton span the interface of the Great Plains and Eastern Woodlands ecological regions of interior North America. Despite a long history of archaeological investigation in these regions, the nature of behavioral and adaptive diversity within the shared technological systems of these early hunter-gatherers has rarely been explored. This symposium seeks to examine how these societies operated across the large and diverse regions of the North American midcontinent during the Late Pleistocene and Early Holocene, incorporating both site and regional-level data and highlighting work at both new and previously reported sites.

**[98] Symposium · UPPER PALEOLITHIC IN SOUTHWESTERN IBERIA: THE SITE OF VALE BOI**

Southern Iberia is a particularly interesting region to study Upper Paleolithic adaptations due to its cul-de-sac geographical and biological traits. However, the southern Iberian Atlantic coast shows a markedly low number of Upper Paleolithic sites. Vale Boi is one of the few exceptions and the only one with a long sequence starting with early Gravettian, followed by Proto-Solutrean, Solutrean, and Magdalenian, overlaid by Mesolithic and Neolithic occupations. Vale Boi was discovered in 1998, tested in 2000, and excavated since then up to 2019, but for 2014. The site is marked by a long sequence of archaeological horizons, likely all representing complex palimpsests. There are various loci, including open-air areas and rockshelters. Organic preservation is very good, and charcoal, bone, and shell are present. This symposium will present an overview of the results of close to 20 years of excavation, analyses, and absolute dating from Vale Boi, thus helping to characterize the Upper Paleolithic of southern Iberia.

**[99] Symposium · RECONSIDERING THE MONGOL EMPIRE: INTEGRATING HISTORIES AND ARCHAEOLOGIES TO BUILD NEW NARRATIVES**

Depictions of the Mongol Empire often focus on invading armies and the conquest of new lands that created the largest contiguous empire in history. Building nuanced narratives necessitates support from textual sources in multiple languages and archaeological evidence from a vast landscape. The fragmentary nature of Mongol-era evidence requires a search for overlapping patterns in different source materials. This session brings together archaeologists and historians researching the Mongol Empire. This includes earlier configurations of empires centered in the Mongolian plateau and the aftermath of the empire (~1000–1500 CE). We aim to highlight cosmopolitan engagements of the Mongol Empire, especially within its center of power in Mongolia. Pathways of exchange are of interest, especially the extent of networks, materials traded, and movement of populations. Participants should highlight fixed places that are central to Mongol life, including cities, itinerant camps (ordo), and activities occurring at central places. Evidence for rituals and religions are critical, especially where established religions intersect with local ritual practice. Finally, economic patterns that are the foundation of society are integral to reconstructing the past. We invite scholars working in different regions of the world and from varied research backgrounds to take part in this session.

**[100] Forum · CONFRONTING ABLEISM IN ARCHAEOLOGY: INVITING DISABILITY EXPERTISE TO THE TABLE**

Archaeology is a historically ableist discipline, founded by the eugenic institutions that underpin anthropology's disciplinary origins more broadly. Paired with the systemic ableism that shapes all of academia and research, archaeology's emphasis on physically strenuous fieldwork makes the discipline inhospitable and inaccessible to many disabled people—as well as being a source of debilitation to others. Nonetheless and perhaps because of this relationship with disability, disabled archaeologists are omnipresent, often hiding in plain sight, and passing as nondisabled either by choice or by default. In this forum, a diverse panel of archaeologists—including a number of disabled practitioners—explores how ableism shapes the culture and practices of archaeology across institutional settings. We draw on the disability expertise of archaeologists practicing in academic, compliance, government, and community contexts and ask: how can disabled archaeologists and allies confront epistemic and material injustices in our daily lives and remake our discipline to be more accessible, equitable, and just? This forum is supported by the Disabled Archaeologists Network.

**[101] Symposium · INTERDISCIPLINARY APPROACHES TO ROCK ART DOCUMENTATION, RESEARCH, AND SITE MANAGEMENT, PART 2**

*(SPONSORED BY ROCK ART INTEREST GROUP)*

Current rock art research is interdisciplinary, drawing methods and knowledge from fields such as chemistry, digital data and computer science, geology, history, and psychology. These interdisciplinary approaches augment and enhance rock art documentation, offer new strategies for effective site management, and facilitate new interpretive insights for rock art provinces around the world. This Rock Art Interest Group-sponsored session provides a forum to share recent rock art–related work from a wide range of topics.

**[102] General Session · ART AND ICONOGRAPHY ACROSS THE GLOBE****[103] General Session · ARCHAEOASTRONOMY****[104] General Session · MAYA ARCHAEOLOGY, PART I****[105] General Session · PALEOINDIAN ARCHAEOLOGY: GEOARCHAEOLOGY AND DATING****[106] General Session · RECENT RESEARCH ACROSS AFRICA**

**[107] Symposium · ARCHAEOLOGIES OF MIGRATION: ANCIENT TO MODERN**

"Migration" connotes varied modes of movement, including abandonment, travel, displacement, diaspora, and more. The reasons groups of people migrate are as diverse as those people themselves, stemming from shifts in social organization, potentially involving foodways, beliefs, customs, status, race. Migration builds or breaks bridges among regions and communities, resulting in the transformation of local cultures and traditions, regional networks, and in- and out-flows of goods and knowledge. Papers for this symposium explore networks of power that condition patterns of mobility across civilizations and time periods. Beginning with prehistoric trade routes in Longshan China, then moving across millennia to the diaspora of indentured laborers in the Indian Ocean from the nineteenth to twentieth centuries, papers examine how both material and cultural boundaries impact the movement of peoples. Topics ranging from Native migrations and rock art in North America's Northern Plains to the history of colonial settlement along the US-Mexico border elucidate how shifting agricultural, economic, and political landscapes—embedded in regional systems of power—influence mobility. This methodologically rich symposium aims to stimulate cross-regional, cross-temporal discussion about archaeological conceptions of migration and offer insights into the significance of migration to social dynamics and community networks in both ancient and modern contexts.

**[108] General Session · ARCHAEOLOGY OF THE IBERIAN PENINSULA AND BALEARIC ISLANDS****[109] General Session · RECENT RESEARCH IN THE WOODLAND TRADITION OF NORTHEASTERN NORTH AMERICA****[110] General Session · MAYA ARCHAEOLOGY, PART II****[111] General Session · ADNA, THE DENTAL MICROBIOME, AND TEETH****[112] Hybrid Forum · MARITIME PREHISTORY OF NORTHEAST ASIA 1: BOATING AND PLEISTOCENE MARITIME MIGRATION**

Prehistoric maritime Northeast Asia is poorly represented in English or in global syntheses of human history. This is unfortunate given the presumed role of boating in human dispersal and the Pleistocene settlement of the Americas and because the region long served as a dynamic cultural corridor linking East Asia and Northwest North America. If archaeologists are to assess hypotheses concerning late Pleistocene seafaring around the North Pacific Rim, then comprehensive evidence from Northeast Asia is imperative. This first of two linked forums will discuss and debate the implications of the Northeast Asian Pleistocene record for understanding the role of maritime lifeways in the initial settlement of coastal and island Northeast Asia, taking into account archaeological, paleogenetic, climatological, and oceanographic evidence. Our goal is to broaden discussion of Northeast Asian evidence for its own sake and for its relevance to the settlement of Beringia, the Beringian standstill hypothesis, and the peopling of the Americas. The starting point for the discussion will be a recently edited volume on the maritime prehistory of Northeast Asia (Cassidy, Ponkratova, and Fitzhugh, in review).

**[113] Poster Session · DIGITAL ARCHAEOLOGY ACROSS NORTH AMERICA****[114] Poster Session · CONSERVATION AND WORK WITH MUSEUM COLLECTIONS****[115] Poster Session · RECENT ADVANCES IN GEOARCHAEOLOGY****[116] Poster Session · PALEOINDIAN IN THE AMERICAS****[117] Poster Session · CONVERSATIONS ON HUNTER-GATHERER BEHAVIOR AND LIFEWAYS**

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

**[118] Symposium · ACROSS THE INTERNATIONAL FOUR CORNERS OF THE UNITED STATES AND MEXICO: PAPERS IN HONOR OF MICHAEL E. WHALEN AND PAUL E. MINNIS**

Paul E. Minnis and Michael E. Whalen created an enduring legacy through careers marked by decades of archaeological work, publications, and education. Among their contributions to archaeology is their collaborative work that revealed and fertilized novel insights into the Casas Grandes archaeological culture in northern Chihuahua, Mexico, that had been most prominently known through the seminal work of Charles C. Di Peso. In addition, they advanced and promoted knowledge about the archaeology of the El Paso, Texas, area, ethnobotany, and the Mimbres region. In this session, students and professionals share their memories about these two scholars and their lasting influence on current research.

**[119] General Session · ARCHAEOLOGY OF THE WOODLAND TRADITION****[120] Symposium · FIRST PEOPLES: A GLOBAL, COMPARATIVE EXAMINATION OF HUMAN COLONIZATION EVENTS**

*Homo sapiens* evolved in sub-Saharan Africa and from there spread around the globe. Due to geographic specialization within our field, human colonization events are usually investigated in a piecemeal manner, with each event being viewed in isolation, but the breadth of knowledge of the global archaeological record allows for an exploration of variation in human behavior among colonization events. The aim then of this session is to bring together scholars working in different regions and periods around the globe to investigate human colonization as a process. The intent is to address broad questions that ultimately transcend regional culture histories to develop a general understanding of the phenomenon of human colonization. Papers in this session will take

unique geographic and temporal foci to explore various themes governing the process of human migration and colonization, touching on topics of climate change, human-environmental interaction, technology, mobility, subsistence, demography, and space-time dynamics.

**[121] Symposium · INCLUSION, EXPANSION, AND HUMILITY IN NORTH AMERICAN ARCHAEOLOGY: PAPERS IN HONOR OF KENT G. LIGHTFOOT, PART 2**

In a dynamic near half-century career of insight, engagement, and instruction, Kent G. Lightfoot has transformed North American archaeology through his innovative ideas, robust collaborations, thoughtful field projects, and mentoring of numerous students. This session consists of archaeologists profoundly influenced by Lightfoot; they present papers emphasizing the multifarious ways he impacted—and continues to impact—their approaches to archaeological inquiry, anthropological engagement, Indigenous issues, and professionalism. The papers are highly varied but intersect with four primary themes: (1) negotiations of intercultural entanglements in pluralistic settings with attention to resilience and persistence; (2) transformations of temporal and spatial archaeological dimensions as well as theoretical and methodological innovations; (3) engagement with contemporary people and issues; and (4) leading by example with honor, humor, and humility. These ideas and the evolving directions in which the presenters pursue their projects form an inextricable part of Lightfoot's legacy. They reflect the remarkable depth, breadth, and growth in his career, despite his unwavering stylistic devotion to Hawaiian shirts.

**[122] Symposium · PASTORALISTS AS AGENTS OF SOCIAL CHANGE**

Pastoralists have influenced cultural, political, and environmental change in many periods and regions of the world. This session brings together current research on the fundamental impacts of livestock herding by exploring the political and social agency of pastoralists, their dynamic cultural strategies, environmental impacts of livestock management, pastoralism as a form of mobility and migration, and the emergence of pastoralism as a distinctive economic strategy and cultural expression. Contributions from scholars in many regions of the world and time periods showcase the diversity of pastoralist societies while highlighting their significant influence on politics, religion, institutions, economies, cultures, and environments.

**[123] Symposium · REIMAGINING/RETHINKING SPACE, PLACE, AND LANDSCAPE IN OAXACA, MEXICO**

Continuing the goals of the "Diálogos en Oaxaca" writing group, the present symposium will reimagine, rethink, and even reconsider place, landscape, and spaces in general in Oaxaca, Mexico. How can we approach these topics with fresh perspectives, incorporating newer theories as well as insights and experiences from the peoples and cultures we study, both past and present? Presenters will discuss all types of spaces, places, and landscapes and the different methods, from survey to archival research, that can be used to investigate them. Places, landscapes, and spaces in general, however defined, are invested with symbolic and cultural meanings through their use by human social groups. The mapping of individual, local, and mythical histories onto places, landscapes, and spaces articulate together the spatial and the social. At the same time, these attached and attendant meanings can be multiple, contesting, and contrasting because an individual's experience of the spaces around them largely depends on the specific set of economic, political, and social relations under which they live.

**[124] Symposium · THE ANTISUYU AND BEYOND: THE CREATION OF BORDERS AND THE RUPTURE OF AMAZONIAN AND ANDEAN RELATIONS**

The Antisuyu of the Tawantinsuyu is one of the quarters less understood. Despite its critical economic and ideological importance, the Inka Empire altered enduring Andean and Amazonian forms of interaction that thrived since antiquity. Such relations were essential in the provisioning of esoteric knowledge, and in the bidirectional flow of valuable resources, movement of communities, technologies, and ideologies. This symposium is dedicated to exploring such relations by zooming in the eastern tropical mountains as the core area of such interactions. Seemingly conceived as a marginal region, a natural barrier and frontier, important corridors crisscrossed these territories where peoples of different origins, languages, and cultural traditions converged and established kindred and trade relations. Using different scales of analysis and multidisciplinary research, such as archaeology, ethnohistory, and chemical studies, the dynamic nature of such relations will be explored using different scales of analysis.

**[125] Symposium · FROM THE EARTH TO THE PLATE: ENVIRONMENT, RESOURCE PROCUREMENT, AND FOODWAYS IN THE ISTHMO-COLOMBIAN AREA AND THE CARIBBEAN ISLANDS**

The rich and diverse neotropical forests have been the source of a variety of resources that support the traditional livelihood of modern Indigenous populations and small farmers in southern Central America, Colombia, and the Caribbean islands. Decades of research have contributed to understanding how these environments have sustained human populations for centuries. Currently, multinational projects and local studies are researching the utilization and consumption of forest resources by implementing innovative studies of faunal and botanical remains to record ancient foods and foodways. Such studies provide opportunities for exploring themes such as the social, political, economic, ritual, and nutritional implications of food procurement and consumption, as well as investigating cooking technologies, changes in consumption and production patterns, food and identity, psychoactive foods, resource procurement strategies, and human-environment interactions. This symposium brings together a number of papers exploring food in the past from a variety of methodologies and technologies, including zooarchaeological studies, ethnoarchaeological studies, archaeobotanical studies, chemical residue analyses, stable isotope analyses, and ancient DNA analyses. A comparative perspective on such findings can enhance our knowledge about human-environment interactions and food procurement throughout the Isthmo-Colombian area and the Caribbean islands.

**[126] Symposium · FINDING FIELDS: THE ARCHAEOLOGY OF AGRICULTURAL LANDSCAPES  
(SPONSORED BY AD DIVISION [AAA])**

Archaeological analysis of ancient agricultural fields can provide key anthropological insights into past subsistence strategies, communities' political economies, environmental entanglements, and ideologies of land, labor, and gender. And yet the subtle traces of agricultural fields (e.g., field boundary features, stone clearance mounds, anthropogenic soils, and artifact scatters) are among the most difficult features to resolve archaeologically. Moreover, the expansiveness of ancient field systems combined with their often ephemeral nature make agricultural landscapes a serious challenge to preserve and protect as they are easily lost to erosional processes and modern development. This session brings

together a group of scholars employing innovative new methods to discover, map, and interpret ancient field systems. Papers explore the social and political contexts of agriculture, challenge colonial narratives about Indigenous fields, and engage with emerging global discourses of the Anthropocene, all facilitated by a suite of emerging methods including advances in aerial, satellite, and ground-based remote sensing technologies as well as new approaches in geochemical, isotopic, and archaeobotanical analyses. Papers in this session are part of a forthcoming publication of the Archaeological Papers of the American Anthropological Association (AP3A).

**[127] Symposium · ARCHAEOLOGY-CLIMATE NARRATIVES: SCIENCE-TELLING FOR INCREASED ENGAGEMENT**  
(SPONSORED BY CLIMATE CHANGE STRATEGIES FOR ARCHAEOLOGICAL RESOURCES)

Sea-level rise, increased storm frequency, rising temperatures, forest fires, erosion, debris flows: archaeologists are familiar with the ever-increasing litany of climate change threats to cultural resources, scientific information, and community heritage. How well do we communicate these threats? How well do we advocate for archaeology, which is positioned to offer long-term, interdisciplinary perspectives on human-climate interactions? As scientists, we are socialized to educate and share information through statistical, expository, and deductive approaches—a communication strategy that furthers the discipline but may not speak to decision-makers, community members, or funders. In this session, we demonstrate the potential of alternative communication strategies that use robust research as the foundation for narratives describing human responses to climate change, impacts to cultural resources, and collaborative approaches to documenting loss. We argue that a narrative communication style will result in increased comprehension, interest, and engagement with diverse audiences. Promoting and protecting the strong connection between community well-being and heritage resources requires the development of new skills. The session will provide examples of digital storytelling, visualizations, vignettes, and other approaches that can be adopted by archaeologists to impress upon the public the importance of our discipline for understanding what lies ahead.

**[128] Symposium · EARTH, WIND, WATER, AND FIRE IN MESOAMERICA: CELEBRATING THE WORK OF KARL A. TAUBE**

Karl Taube's career began while still a graduate student at Yale with major contributions to Maya iconography and epigraphy. He has since published countless pathbreaking studies in the art and archaeology of Mesoamerica and the Greater Southwest. In this session his students and colleagues come together to celebrate his body of work and positive impact on the field, as a mentor, collaborator, and friend. Roughly organized by region, speakers present studies from the Maya Lowlands, northern Yucatan, Central Mexico, and the American Southwest. Diverse methods are employed, including iconography, epigraphy, archaeology, lithic studies, ethnohistory, and ethnography, which reflect the multidimensionality of Taube's approach and the broad influence of his research. Topics at the core of Taube's repertoire are examined, such as maize symbolism, concepts of paradise and the afterlife, carved and chipped jade and flint, and cults of war as expressed in Central Mexico and the Maya area, as well as the forces of wind, rain, and agricultural fertility in Mesoamerica, broadly conceived.

**[129] Symposium · LEVERAGING RADIOCARBON IN THE CENTRAL ANDES: FROM CHRONOLOGIES TO RESEARCH AGENDAS**

Development of a working chronological scheme was a fundamental goal of early archaeological research in the Central Andes. Seminal research in the field was so successful at achieving this goal that the research agenda of Andeanist archaeology remains structured by its foundational chronological schemas even as details have been continuously revised. In spite of competing periodization schemes and even debate about the theoretical underpinnings of periodization itself, the field still relies on blocks of time defined by diagnostic material culture as conceptual tools for ordering the Andean past. One response has been to call for the replacement of divergent periodization schemes with calendar dates, underpinned by the expansion of radiometric dating. The rapidly growing assemblage of Central Andean radiocarbon dates remains an underexploited resource for developing and addressing major archaeological research questions. With the goal of developing new research agendas, we invite contributors to this session to explore aspects of the Central Andean radiocarbon record. Critical evaluation of the  $^{14}\text{C}$  assemblages includes, for instance, (1) exploring patterns in time and space with GIS and Bayesian models, (2) revisiting the time spans of existing periods, and/or (3) identifying intractable or important problems to be addressed with new dating.

**[130] Symposium · THE LIVED EXPERIENCE OF ECONOMIC INEQUALITY: TRACKING THE MATERIAL CORRELATES ACROSS CONTEXTS**

(SPONSORED BY SOCIETY FOR ECONOMIC ANTHROPOLOGY)

Sponsored by the Society for Economic Anthropology (SEA), this session explores current archaeological research investigating diverse lived experiences of economic inequality. We consider a range of temporal and physical settings to interrogate how social processes materially impact the inhabited landscape and human body. Theoretical orientation centers on the manifestation of inequality through embodiment, survivance, and practice theory. Session participants represent various subdisciplines including bioarchaeology, ethnohistory, iconography, spatial analysis, and zooarchaeology. Through their diverse specialties, each participant leverages archaeological method and theory to read physical markers on bones, landscapes, and material culture. This symposium reflects the persistent role that inequality has in constructing the human experience regardless of space or time and charts how inequalities have been navigated in the past. Economic disparities have and will continue to shape our communities, homes, material goods, and our very bodies.

**[131] Symposium · WEST COAST SHELL MIDDENS: PLACE-BASED ONTOLOGIES AND SOCIALLY CONSTRUCTED LANDSCAPES**

Shell midden archaeology on the West Coast of North America is expanding beyond its ecological and settlement-subsistence roots to embrace ontological theories and practice theory. These frameworks argue that such archaeological deposits are situated in constructed social landscapes that embody meaning as well as function. Shell midden deposits are the material remains of recursive social use of a locale that reiterates, builds, and contests identities and social relations among people, landscapes, and other-than-humans that live in those landscapes. As such, they provide a critical view of relationships between humans and their social and material environment. This symposium presents a cross-section of case studies that seek to emphasize the culturally meaningful and active place of shell middens.

**[132] Symposium · ANCIENT GLASS IN THE OLD WORLD**

In archaeology, the study of ancient glass contributes to a better understanding of the past by addressing questions related to three subtopics: technology, circulation, and use. The study of glass technology investigates recipes, ingredient sourcing, recycling, glass transformation, and their economical corollaries. Tracking glass circulation is a way to reconstruct trade routes and understand interaction between ancient communities. Finally, the use of glass is at the center of inquiries about status and provides information about sociocultural affiliations. Despite the insights that glass can provide in the life of ancient communities, this material does not get the attention that ceramic or metal garner. It is particularly true in North America where very little glass research has been conducted, more especially for glass in certain areas of the Old World. With this panel, we want to present new research taking place in American institutions with a focus on the Mediterranean area and the Middle East to stimulate discussions across disciplines.

**[133] Forum · LAND AND WATER REVISITED**

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

**[134] Forum · STATE OF THE STATE: THE STATUS OF ARCHAEOLOGY IN THE UNITED STATES**

The face of archaeology in the United States is changing. No longer simply an academic pursuit, archaeology is becoming mainstream. Much of this change has been spurred by passage of the National Historic Preservation Act and subsequent legislation and the rise of cultural resource management. Possibly even more impactful has been the increasing involvement of and demand by Indigenous and descendant communities in managing their past. This forum brings together professionals in the federal, state, tribal, and private sectors to discuss where the profession is today and where it is going.

**[135] Forum · MARITIME PREHISTORY OF NORTHEAST ASIA 2: EMERGENCE OF INTENSIVE MARITIME LIFEWAYS IN THE HOLOCENE**

Prehistoric maritime Northeast Asia is poorly represented in Western literature or in global syntheses of human history. This is unfortunate given the presumed role of boating in human dispersal, the settlement of the Americas, and because the region long served as a dynamic cultural corridor linking East Asia and Northwest North America. If archaeologists are to assess hypotheses concerning Holocene seafaring around the North Pacific Rim then comprehensive evidence from Northeast Asia is imperative. This second of two linked forums will consider the Holocene record and its implications for the development of intensive maritime economies and the role of the maritime zone in the formation and extension of the East Asian World system from the Russian Far East, Japan and Korea to Alaska. Our goal is to broaden discussion of Northeast Asian evidence for its own sake and for its relevance to comparative developments of economic intensification, demographic dynamics, social complexity, and the historical ecology of the North Pacific Rim. The starting point for the session will be a recently edited volume on the maritime prehistory of Northeast Asia (Cassidy, Ponkratova, and Fitzhugh, in review).

**[136] General Session · ARCHAEOLOGICAL EDUCATION****[137] Lightning Round · FROM THE PLAINS TO P-VALUES: PAPERS IN HONOR OF KENNETH L. KVAMME**

This forum honors the research and mentorship of Dr. Kenneth L. Kvamme, a major driving force in the development of computer applications in archaeology. An innovator in the use of geographic information systems (GIS), Dr. Kvamme pioneered the use of predictive modeling with an emphasis on human-environment relationships, intrasite and settlement patterns in the western plains of the United States, and statistical evaluation of results. His dialogues with like-minded European colleagues laid the groundwork for a lively international community of archaeologists who specialize in computer applications that continues to flourish. It is through these relationships that Dr. Kvamme was exposed to geophysical prospection for archaeology. He embraced these developing techniques and through his instruction and application helped herald the widespread use of geophysical prospection in North America. His landmark paper "Geophysical Prospection as Landscape Archaeology" is essential for archaeologists who use remote sensing, and his publications on processing and analysis techniques remain models of good practice that avoid the "black box." In this lightning round, colleagues and mentees celebrate Dr. Kvamme with short presentations of research inspired by his career.

**[138] General Session · NEW RESEARCH ON THE ARCHAEOLOGY OF GENDER AND CHILDHOOD****[139] General Session · EAST ASIAN ARCHAEOLOGY****[140] General Session · INDIGENOUS KNOWLEDGE PRODUCTION AND REPATRIATION****[141] Electronic Symposium · DECOLONIZING DIET: SUPPORTING INDIGENOUS FOOD SOVEREIGNTY THROUGH ARCHAEOLOGY**

The food sovereignty movement calls for the rights of all people to healthy, culturally appropriate food produced through self-determined, ecologically sound, and sustainable methods. For many Indigenous communities, this is more than a matter of preservation; it is an act of autonomy, activism, and survival. While archaeology is still struggling to overcome its colonial roots, as part of the movement toward decolonization, archaeologists can serve Indigenous communities as they develop diverse expressions of food sovereignty. Archaeological data is useful in these efforts because of its spatial and temporal breadth; it results from the material fragments of everyday lives, providing a "from-the-hearth-up" view of foodways before the devastating effects of

colonialism. Temporally, archaeologists have access to the *longue durée* and can speak to long-term sustainable practices and the social, political, and economic context of past food practices. Using case studies, this symposium will explore the unique contributions archaeologists can make to Indigenous food sovereignty throughout North America. Participants working at the intersection of archaeology, ethnobiology, Indigenous studies, and sustainability will synthesize recent progress and develop future directions for supporting communities at the forefront of this movement. In doing so, this symposium seeks to amplify archaeology's contribution to Indigenous food sovereignty.

**[142] Forum · ARCHAEOLOGIES OF AND FOR ENVIRONMENTAL JUSTICE**

As a field, archaeology excels at elucidating human-environment relationships, yet archaeologists rarely engage with questions of environmental justice. Archaeological research already addresses issues of toxicity, climate change, property relations, settlement patterns, and resource management, and by focusing explicitly on justice, it has the ability to analyze and tackle environmental racism, climate justice, and differential access to resources—issues of pressing contemporary concern. Archaeologists have the methodological tools to identify examples of environmental (in)justice in the past, as well as trace how environmental injustices have arisen today through the archaeological record. Importantly, practitioners also have a responsibility to conduct archaeological research in environmentally just ways. In this session, panelists will engage with the topic of environmental justice to generate dialogue about what archaeology of and for environmental justice might/should look like, and how the field can support communities and organizations fighting for environmental justice now.

**[143] General Session · CONTACT PERIOD AND HISTORIC NATIVE AMERICANS**

**[144] General Session · CERAMIC AND CRAFT PRODUCTION IN THE NORTH AMERICAN SOUTHWEST**

**[145] Symposium · PROYECTO ARQUEOLÓGICO MAZAPA-LA SIERRA 2021: NAVIGATING CHANGE AND CONTINUITY IN POSTCLASSIC, COLONIAL, AND CONTEMPORARY VERACRUZ, MEXICO**

This session presents the archaeological fieldwork and preliminary interpretations of the first season of the Mazapa-La Sierra Archaeological Project (PAMLAS). Papers presented by the project members focus on fieldwork methods, ceramic and lithic analysis, community relations, and looting. The session is a first opportunity to present PAMLAS, a project in the Eastern Lower Papaloapan Basin of southern Veracruz that investigates the prehispanic to colonial eras in Mexico's Gulf Coast region. The project considers both archaeological work and historical evidence to understand how Gulf Coast societies navigated changes and continuities in the prehispanic to colonial periods, and includes as a main goal assessing the sources of cultural continuity that we find in present-day populations and that are an important part of people's identities today.

**[146] Symposium · INTERDISCIPLINARY APPROACHES TO ROCK ART DOCUMENTATION, RESEARCH, AND SITE MANAGEMENT, PART 1**

(SPONSORED BY ROCK ART INTEREST GROUP)

Current rock art research is interdisciplinary, drawing methods and knowledge from fields such as chemistry, digital data and computer science, geology, history, and psychology. These interdisciplinary approaches augment and enhance rock art documentation, offer new strategies for effective site management, and facilitate new interpretive insights for rock art provinces around the world. This Rock Art Interest Group-sponsored session provides a forum to share recent rock art-related work from a wide range of topics.

**[147] Symposium · ARCHAEOLOGY OF THE SOUTHWEST BALKANS**

The Balkan Peninsula is home to a rich and complex archaeological record that has attracted archaeologists foreign and local alike for decades. However, our understanding of the archaeology of this area is complicated by recent historical events that have drastically shaped the direction of archaeological research. For most of the past half century, the paradigms of archaeological inquiry in the Balkans were greatly influenced by geopolitical dynamics. A shared history of communism followed by civil wars and genocide has produced similar but slightly differing archaeological schools of thought across nations. When it comes to the archaeological past of southwestern Balkan territories, cultures were often understood by their relation to neighboring, often state entities. Such interpretations place these southwestern Balkan territories within transitional or peripheral zones of some other "major" culture. This session aims to present current research in Albania, Kosova, Montenegro, and Macedonia through a new lens. One that centers the record of each country regardless of how it "fits" into grander narratives. Additionally, we aim to highlight the new paradigms used by archaeologists in the twenty-first century, marking a distinct break from previous schools of thought.

**[148] Symposium · PUBLISHING DYNAMICS IN ARCHAEOLOGY AND ANTHROPOLOGY**

Within the academy, peer-reviewed publications represent an enduring standard for assessing scholarly productivity and value. However, many aspects of academic publishing dynamics remain underexplored. Issues in need of more detailed examination include the pervasive entanglement of scholarly research and the for-profit publishing industry, the challenges facing open access alternatives, the use of journal prestige hierarchies as a proxy for intellectual merit, biases in the media coverage of different archaeological topics, and the trends in archaeological scholarship reflected in peer-reviewed publications. These topics warrant increasing attention in light of the continuing deterioration of the academic job market, the growing challenges posed by misinformation and disinformation, and the unparalleled potential of new forms of technology to communicate anthropology to a broader audience. This session brings together scholars from a variety of subfields conducting research on contemporary publishing dynamics in archaeology and anthropology. Presentations will explore and address the utility of novel platforms, such as blogs and e-books, for the accessible dissemination of academic research, the visibility (or invisibility) of collaborative work in author assignments, the disciplinary emphasis on publication in science-subject journals, the development of community standards to ameliorate peer review culture, and popular science coverage of archaeological research.

**[149] Symposium · NEW FRONTIERS IN ARCHAEOLOGICAL RESEARCH ON HUNTER-GATHERER MOBILITY**

Reconstructing mobility patterns is a fundamental part of archaeological research on hunter-gatherer societies, as mobility is inextricably linked to subsistence strategies, the organization of technology, and interaction among groups. Mobility is reconstructed

in a number of ways. Early on, attention focused on lithic procurement, curation, and reduction stages. In recent years, additional lines of evidence have been explored, including isotopic signatures, ancient DNA, incremental cementum bands, and computational models, all of which exhibit great potential. These new proxies provide archaeologists with the opportunity to pose new questions and, when combined with results from lithic analyses, offer promising avenues of investigation for the aforementioned issues. The present session showcases recent studies that involve innovative approaches to hunter-gatherer mobility and address some of the issues that remain poorly understood, such as seasonal movement, territory, and social networks, as well as individual versus group movement. Many of the studies involved integrative analyses of related lines of evidence.

**[150] Symposium · RECIPES OF PRACTICE: THEORIZING THE LINK BETWEEN CERAMIC PASTE COMPOSITION AND POTTING COMMUNITIES**

Ceramic petrography and bulk chemical analysis have been widely used in archaeological research to gain insights into a broad range of questions from raw material choice to production techniques to long-distance exchange. A strength of these approaches lies in their ability to identify discrete paste recipes, allowing for insights into underlying economic, political, and cultural landscapes in which pottery was produced. In particular, the hidden nature of paste recipes as compared to other facets of pottery such as surface treatments and vessel forms makes this aspect particularly promising for identifying communities of practice and detecting changes in social identities of potters over time. However, many studies are lacking detailed theoretical discussions of the links between paste recipes, potter identity, and social organization. This session therefore brings together experts in ceramic petrography and chemical analysis to share their theoretical approaches to the connection between paste recipes and social identity, using case studies from around the world. This in turn will help inform scholars undertaking petrographic and bulk chemical studies of ceramics of the diverse ways that these recipes can be interpreted and the connection between paste, identity, and community can be theorized.

**[151] Symposium · FRYXELL SYMPOSIUM IN HONOR OF DOLORES PIPERNO  
(SPONSORED BY FRYXELL COMMITTEE)  
[POSTPONED UNTIL 2023]**

**[152] Symposium · NEW PERSPECTIVES FOR CHACO OUTLIER RESEARCH AND ADVOCACY**

The objective of this organized session is to survey current perspectives and research that involves Chaco outliers. For 50 years, archaeologists have sought to understand the Chaco world by balancing research in Chaco Canyon with research at outlier great house communities. Recent work within Chaco Canyon has painted a comprehensive picture of culture, society, and history within the Chacoan core that is distinct from archaeological models of Chaco Canyon even a decade ago (e.g., Crown and Wills 2018; Heitman and Plog 2015). We also recognize that it has been over 20 years since the compilation of a database of Chaco outliers which resulted first in an edited monograph (Kantner and Mahoney 2000) and later in the Chaco Canyon Outlier Database. Since then, our knowledge of the world outside Chaco Canyon has improved, new methods are being deployed, new research themes and contexts have emerged, and Chaco research includes a greater diversity of perspectives. We anticipate individual papers to be as varied as the Chaco outliers themselves, but wish to retain focus on a key issue that spurred outlier research in the first place: e.g., how should we incorporate outlier communities into our conception of the Chaco world?

**[153] Symposium · PAPERS IN HONOR OF THE ALPHAWOOD FOUNDATION OF CHICAGO'S MAYA ARCHAEOLOGY PROGRAM**

Since its inception in 1992, the Alphawood Foundation of Chicago's mission has been to work for an equitable, just, and humane society. In 2009, Alphawood began supporting Maya archaeological research at a critical time when a severe recession had impacted more traditional funding agencies and groups. As the Maya portfolio grew from two projects in 2009 to 16 in 2019, Alphawood funded scholars of all academic ranks at a wide spectrum of academic institutions. Alphawood has provided multiyear grants to Maya archaeologists, allowing principal investigators the ability to investigate research questions that require several seasons of fieldwork and analysis, a luxury afforded by few other funding sources. With the annual meeting in Chicago, this session celebrates Alphawood's contributions to Maya archaeology and the freedom that financial support has provided to investigators, allowing them to take risks to do their best work. The assembled papers are from Alphawood Foundation grantees. They investigate a wide range of time periods and topics, highlighting the innovative archaeological investigations that have been undertaken in the Maya area with the long-term sponsorship afforded by this key foundation.

**[154] Symposium · MANGROVE ARCHAEOLOGY: GLOBAL COMPARATIVE PERSPECTIVES ON METHOD AND THEORY  
(SPONSORED BY ISLAND AND COASTAL ARCHAEOLOGY INTEREST GROUP)**

Blurring boundaries between land and sea, mangrove forests line (sub-)tropical coasts and estuaries in many parts of the world and mangroves' importance to traditional subsistence practices, coastal erosion, and wildlife preservation is well-recognized today. Yet, the singular environments of mangrove swamps remain little studied from the viewpoint of comparative archaeology. Due to the boundary position of mangrove forests, proper theoretical and methodological frameworks have yet to emerge to archaeologically address these challenging environments. In this session, we aim to offer a current state of affairs of the archaeology of mangroves to feed a reflection on "mangrove archaeology"—not only as doing archaeology in mangrove environments but also to archaeologically explore the different meanings of these environments to past communities. This session will provide a comparative perspective with case-studies from the Americas, Southeast Asia, and Oceania to develop methodologies for mangrove archaeology on a global scale. Bridging environmental approaches with socially rooted frameworks, these studies will theoretically engage with the role of mangrove forests in shaping communities and their practices. Offering an unprecedented comparative overview of mangrove environments past and present, this symposium will offer a first reflection of what it means to live in, with, and among the mangroves.

**[155] Symposium · PALETTES OF THE PAST: ARCHAEOLOGY OF THE EXTRACTION, PRODUCTION, EXCHANGE, AND USE OF PIGMENTS***(SPONSORED BY PREHISTORIC QUARRIES AND EARLY MINES INTEREST GROUP [PQEMIG])*

Pigments form an integral part of the archaeological record due to the large quantity, variety, and ubiquity of objects and contexts that evidence their use. Material evidence from various regions of the world demonstrates that colorants were important and have played a significant role in human symbolic capacity and expression from as far back as 150,000 years ago. Although recent scholarship has included an encouraging growth of technical studies related to the characterization and identification of colorants, fewer studies have sought to problematize the materiality of pigments by examining their role, agency, and value across diverse social contexts. In particular, we still have a limited understanding of how ancient systems of pigment extraction, production, and exchange were integrated and changed through time. This symposium invites researchers to explore economic, social, and symbolic aspects of mineral pigments to contribute to a growing body of literature on pigment archaeology.

**[156] Symposium · IN MEMORY OF WENDY ASHMORE: LANDSCAPES OF MEANING, BIOGRAPHIES OF PLACE, AND ARCHAEOLOGIES OF COMPASSION, PART 1**

Wendy Ashmore (1948–2019) created an enduring legacy of research through her numerous contributions as a scholar, colleague, and mentor. In her early career, she helped launch foundational settlement pattern studies in the Maya area. She redirected homogeneous site-based analyses to include remains of households, thereby inspiring others to examine the diversity of people and practices at more intimate scales of analyses. In her many subsequent publications, she insisted on finding the agency and humanity of people in the past. For Wendy, landscapes were meaningful, symbolic, and imbued with memories that transformed them into socially, cosmologically, and historically significant places. No matter the scale, for her, the focal point was the reciprocal entanglement of people and places and the palimpsests left by their interactions. This deep interest in people and their actions carried over into other aspects of her career. Throughout, she engaged in an archaeology of compassion that helped her to bridge theoretical and disciplinary divides that created dynamic collaborations, and brought out the best in her students. The contributions in this session are inspired by Wendy's research and aim to capture her spirit in an ongoing dialogue involving landscapes of meaning, biographies of place, and archaeologies of compassion.

**[157] Symposium · ETERNAL MIGRANTS? SCALE, MEANING, AND PRACTICE IN THE ARCHAEOLOGIES OF PAST MIGRATION***(SPONSORED BY THE SOCIETY FOR ARCHAEOLOGICAL SCIENCES)*

Was migration the de facto state of humanity, even for sedentary people? How did life experience, landscapes, and external groups or forces constrain/enable migration or life after? Strontium isotope analysis ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) is the most reliable method for identifying first-generation immigrants, as it provides direct evidence of intra-lifetime mobility. Strontium analysis is now considered to be in its "golden age," spurred on by advances in instrumentation, baseline bioavailable Sr modeling, database development, meta-analyses, diagenesis indices, controlled feeding studies, incremental or multi-tissue sampling, and multi-isotope studies. Despite these methodological advances, most studies are limited to identifying nonlocals without critically exploring why and how they moved within broader cultural contexts. Some  $^{87}\text{Sr}/^{86}\text{Sr}$  studies do engage with theory (identity, colonialism, imperialism, entanglement, necrosapes, and relational ontologies), augmenting interpretive possibilities, but single-variable design ultimately constrains the questions that are asked and answered. This session highlights theoretically engaged case studies synthesizing  $^{87}\text{Sr}/^{86}\text{Sr}$  with at least one non-isotopic correlate to more fully interrogate the multiplicity of motives, meanings, and strategies negotiated by past migrants. Explicitly theorized and multi-proxy archaeological cases enable us to explore the scale, meaning, and practice of past migration, which are vital to understanding the causes and consequences of migration for migrants and receiving communities.

**[158] Poster Session · RECENT RESEARCH ACROSS ASIA****[159] Poster Session · ARCHAEOLOGICAL PEDAGOGY, LEARNING ENVIRONMENTS, AND PUBLIC ENGAGEMENT****[160] Poster Session · RECENT RESEARCH ON DEMOGRAPHY AND SETTLEMENT PATTERNS****[161] Poster Session · CONTACT PERIOD AND HISTORIC ARCHAEOLOGY IN NORTH AMERICA****[162] Poster Session · PIGMENTS AND TEXTILES****[163] Symposium · INTERDISCIPLINARY EXPLORATIONS OF URBANISM, POLITY, AND DAILY LIFE IN TEOTIHUACAN AND BEYOND: SYMPOSIUM IN MEMORY OF GEORGE COWGILL**

George Cowgill (1929–2018) was a pioneer in redefining our approaches to understanding ancient urbanism. As one of the founding researchers of Teotihuacan archaeology in the United States, he was among the first to apply computational quantitative methods to archaeological metadata, and tackled entire labs full of ceramic artifacts with thoughtful persistence, rigor, and dedication. Cowgill's comprehensive approach to reconstructing the development of Teotihuacan and its organization as a city and society was rooted in his experience digitizing and tabulating city-wide survey data and his direction of projects in the city core (Feathered Serpent Pyramid) and hinterlands (Cerro Portezuelo). The durable legacy created by Cowgill and the Teotihuacan Mapping Project members continues to influence our understanding of Teotihuacan urbanism (especially its rise and fall) and to stimulate new methodological and theoretical directions. Cowgill's dedication to detailed, empirical analyses of artifacts and archaeological data was enriched by his commitment to interdisciplinary collaboration and to the development and application of social theory. His invaluable contributions as a scholar and teacher have inspired many of us working at Teotihuacan and beyond. In this session, we bring together George's students and colleagues to celebrate his scholarship and life as a mentor, colleague, and friend.

**[164] Symposium · ARCHAEOLOGY OF METROPOLITAN CHICAGO, PART 1**

Metropolitan Chicago sits atop a highly dynamic glacial landscape with a robust 12,000-year-long history of human occupation. The dynamism is reflected in the fluctuation in Lake Michigan water levels, at one time extending 15 miles inland, and at another receding 30 miles to the east. The wetlands, rivers, upland prairies, and wooded moraines at the southern end of Lake Michigan

supported unusually dense and varied concentrations of plant and animal resources. Chicago is, and was always, a crossroads—containing the key transportation link between the Gulf of Mexico, the Great Lakes, and eastern North America via the Chicago Portage across a shallow continental divide. Still preserved under streets and parking lots, and in forest preserves and city parks, metro Chicago contains thousands of sites, including Paleoindian campsites, seasonal Archaic habitations, Woodland and Upper Mississippian villages, contact period interactions, locations of nationally important political and social events, and World War II German POW camps. Papers in Part 1 of this symposium present the results of new research on well-known prehistoric and protohistoric sites as well as investigations of newly discovered sites.

**[165] Forum · DIVERSIFYING CURRICULUM: TRAINING FOR INCLUSIVE ARCHAEOLOGIES ROUNDTABLE**  
(SPONSORED BY COMMITTEE ON CURRICULUM; COMMITTEE ON THE STATUS OF WOMEN IN ARCHAEOLOGY)

Over the past several decades, many archaeologists have worked to bring attention to pressing equity issues in the training of archaeologists. Recent events have highlighted the need to more thoroughly incorporate the work, resources, and knowledge of archaeologists who have been part of this work. Changes that historically underrepresented and marginalized archaeologists have repeatedly called for are only now starting to be incorporated into syllabi, broader curricula and public programming. But for educators who are not already engaged in this work, it can be daunting to implement. This session brings together archaeologists working for changes that impact how we teach skills and information within broader constructions of knowledge and power to bring more diversity, inclusion, equity, and social justice to archaeology.

**[166] General Session · NEW DIRECTIONS IN CARIBBEAN ARCHAEOLOGY**

**[167] General Session · RECENT RESEARCH IN CENTRAL AMERICA**

**[168] General Session · ARCHAEOLOGIES OF THE PACIFIC ISLANDS**

**[169] General Session · FORENSIC ARCHAEOLOGY, WARFARE, AND VIOLENCE**

**[170] General Session · COVID-19: ASSESSING THE IMPACTS OF A GLOBAL PANDEMIC ON ARCHAEOLOGY**

**[171] Forum · OPEN FORUM ON WOMEN, OUR EXPERIENCES AND ISSUES**

From voluntary identifications and numbers seen at meetings, women appear to be half the membership of the SAA, although neither the SAA nor AAA requires members to identify gender, so ratio of men to women is estimated. Will women predominate in archaeology? Will the profession become a “pink ghetto,” with wages and prestige falling? What issues concern women in the SAA or in CRM, where women-owned small businesses are common? Women now earn more archaeology PhDs, but fewer women than men were hired recently in academia. Spousal hires, childcare, fewer women than men submitting to journals, more women teaching in lower-ranked institutions without research support, fewer women obtaining funding for leading field projects (funded for lab work instead). Some women challenge conventional models and regional or disciplinary boundaries: is it this that marginalizes them, or is it because they are women? An “archaeologist” used to be a man at a major university or museum, freed of all but professional responsibilities by a wife who also typed his publications. Now couples push strollers through meetings, both spouses presenting papers. What can the SAA do to level the playing field and lessen players' stress? This forum will open discussion.

**[172] Poster Session · DIGITAL ARCHAEOLOGY IN CENTRAL AMERICA**

**[173] Poster Session · RECENT RESEARCH IN SOUTHWESTERN ARCHAEOLOGY**

**[174] Poster Session · WHAT IS GOING ON WITH THE ARCHAEOLOGY OF MICHOACÁN, MEXICO?**

This poster session seeks to present a wide variety of the research that has recently been carried out in the state of Michoacán, México. Especially, research related to the work carried out by the INAH-Michoacán Center, where ongoing research is using different archaeometric techniques. The application of geographic information systems and the analysis of different materials, such as bone, ceramic, lithic, and metal, will also be presented.

**[175] Poster Session · MOGOLLON AREA ARCHAEOLOGY: MIMBRES, SALADO, AND IN BETWEEN**

Recent research in the Mogollon region highlights the diversity of cultural changes across the AD 500–1450 time period. Posters in this session apply diverse analyses to understanding Mimbres, Salado, and other developments in this varied region. Ceramics, ground stone, architecture, and subsistence data all reveal how people successfully adapted to changing social and natural environments in numerous ways.

**[176] Poster Session · RECENT RESEARCH IN GREATER NORTHWEST MEXICO**

This poster session provides a space to discuss recent research in Greater Northwest Mexico, including Sonora, Chihuahua, and surrounding regions. Contributions will be focused on the period after AD 1000 through the Spanish colonial period. This was a dynamic era in which several population centers grew to impressive sizes before precipitous declines. In other subregions, there is little evidence of such tumultuous changes. Overlain on these alternative demographic patterns, there is substantial evidence for broad but highly variable participation in regional traditions manifested in many forms of material culture from projectile points to rock-art. The historic and proto-historic periods present equally dynamic patterns of interaction as the region became incorporated into larger world-system economies. Understanding basic patterns of political and economic variation in this period remains a pressing goal relevant not only to regional trajectories but pan-regional interpretations of culture history.

**[177] Symposium · EMERGING FROM ISOLATION: A POST-PANDEMIC ASSESSMENT OF SUBTERRANEAN ARCHAEOLOGY IN MESOAMERICA**

Although slowed by the global pandemic, major discoveries continue to be made in subterranean archaeology in Mesoamerica. In most cases, however, COVID has forced the closing of field research. Nevertheless, laboratory analysis has continued, and the

pandemic has given researchers time to reflect on their work and think about their results in a new light. After a hiatus of three years, this session brings together scholars to share insights, present new ideas or data, and assess the impact of the pandemic on our subdiscipline.

**[178] Symposium · IN SMALL THINGS REMEMBERED: AN ARCHAEOLOGY OF AFFECTIVE OBJECTS AND OTHER NARRATIVES**

James Deetz's assertion that "the past can be seen most fully by studying the small things so often forgotten" transformed material culture studies in historical archaeology. By focusing analytical attention on the incidental objects of everyday life, Deetz urged archaeologists to explore the reciprocal entanglements of human life and material culture, confronting distortions of history by revealing subaltern narratives. For the Milwaukee County Poor Farm Cemetery Project, these affective objects serve as vital windows into the lives, deaths, and burials of more than 2,400 poor, institutionalized, and unidentified individuals interred from 1882 through 1925. Papers in this session explore how a selection of small things transforms our holistic insights and understandings of the individuals, histories, and narratives of this site.

**[179] General Session · COMMUNITY AND PUBLIC ARCHAEOLOGY**

**[180] Lightning Round · LARGE MUSEUM COLLECTIONS AND NAGPRA: A DIALOGUE ON EFFECTIVE REPATRIATION STRATEGIES**

Thirty-two years after the passage of the Native American Graves Protection and Repatriation Act (NAGPRA), over 118,000 sets of ancestral human remains have not been returned to their Indigenous descendants. Data showing large numbers of as-of-yet culturally unidentified Native American ancestors concentrated in a handful of museums presents a grim but incomplete picture that masks the reality of stewarding large archaeological collections. Understanding the mechanisms and history behind the numbers—such as the source of collections, when collections arrived at the facility, and under what legal obligations or ethical guidelines collections were accepted and are maintained—is necessary for authentically engaging in the consultation process. Moreover, consultations on large, complex collections often encompass multiple Tribal Nations based on occupational histories, treaties, and oral traditions. Ensuring that Tribal voices are heard throughout the consultation process is paramount for building trust between Tribes and curating institutions. This lightning round brings together museum professionals and Tribal representatives to discuss challenges and identify solutions for repatriating large museum collections under NAGPRA.

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

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

**[182] Symposium · ARCHAEOLOGY OF METROPOLITAN CHICAGO, PART 2**

Metropolitan Chicago sits atop a highly dynamic glacial landscape with a robust 12,000-year-long history of human occupation. The dynamism is reflected in the fluctuation in Lake Michigan water levels, at one time extending 15 miles inland, and at another receding 30 miles to the east. The wetlands, rivers, upland prairies, and wooded moraines at the southern end of Lake Michigan supported unusually dense and varied concentrations of plant and animal resources. Chicago is, and was always, a crossroads—containing the key transportation link between the Gulf of Mexico, the Great Lakes, and eastern North America via the Chicago Portage across a shallow continental divide. Still preserved under streets and parking lots, and in forest preserves and city parks, metro Chicago contains thousands of sites, including Paleoindian campsites, seasonal Archaic habitations, Woodland and Upper Mississippian villages, Contact period interactions, locations of nationally important political and social events, and World War II German POW camps. Papers in Part 2 of this symposium present the results of new research on well-known historic sites and events as well as investigations of newly discovered sites.

**[183] General Session · ARCHAEOLOGY OF CENTRAL AND WESTERN ASIA**

**[184] Symposium · PEOPLING OF THE AMERICAS: EVIDENCE FROM WHITE SANDS NATIONAL PARK**

Fossil footprints indicate human presence as well as behavioral interaction with other animals. The playa at White Sands National Park in New Mexico has in the last few years been recognized as one of the largest fossil footprints sites in the world, with literally thousands of tracks of humans and Pleistocene megafauna. Numerous locations across the gypsum playa reveal the interaction of humans with megafauna, particularly giant ground sloth and Columbian mammoth. The age of these tracks has remained elusive until recently. A new excavation has bracketed several footprint layers with radiocarbon dates to provide new data on the age of these tracks. These dates and their stratigraphic significance will be reviewed in this session and the implications for the early peopling of the Americas reviewed.

**[185] Symposium · NEW PERSPECTIVES ON HUMAN-ENVIRONMENT INTERACTIONS IN ANCIENT CHINA**

China's interconnected physical geography and deep history present unique opportunities for insights into humans and societies in the past and future. Recent archaeological and paleoenvironmental research has provided important and abundant data linking environmental and cultural changes in ancient China. Nevertheless, the relationships between humans and the environment are complex and multidimensional, rather than a simple correlation and causation depiction. This still remains as much a theoretical task as a methodological one. By bringing together the recent work on a wide range of topics and approaches, including climate change, subsistence activity, landscape, and various forms of technological practices (e.g., plants and animals), this session expects to provide a more nuanced understanding of human-environment dynamics in ancient China.

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

This symposium presents new and ongoing research on the archaeology of Africa. Presenters use a broad range of methodological techniques and cover contexts from throughout the continent. The scale of analysis ranges from highly focused (study of an individual artifact or a minute examination of a single house) to expansive (broad regional surveys). This session will provide a venue to discuss new findings and approaches as they relate to the archaeology of Africa.

**[187] General Session · RECENT ADVANCES IN LITHIC ANALYSIS****[188] Symposium · IN MEMORY OF WENDY ASHMORE: LANDSCAPES OF MEANING, BIOGRAPHIES OF PLACE, AND ARCHAEOLOGIES OF COMPASSION, PART 2**

Wendy Ashmore (1948–2019) created an enduring legacy of research through her numerous contributions as a scholar, colleague, and mentor. In her early career, she helped launch foundational settlement pattern studies in the Maya area. She redirected homogeneous site-based analyses to include households, thereby inspiring others to examine the diversity of people and practices at more intimate scales of analyses. In her many subsequent publications, she insisted on finding the agency and humanity of people in the past. For Wendy, landscapes were meaningful, symbolic, and imbued with memories that transformed them into socially, cosmologically, and historically significant places. No matter the scale, for her, the focal point was the reciprocal entanglement of people and places and the palimpsests left by their interactions. This deep interest in people and their actions carried over into other aspects of her career. Throughout, she engaged in an archaeology of compassion that helped her to bridge theoretical and disciplinary divides that created dynamic collaborations, and brought out the best in her students. The contributions in this session are inspired by Wendy's research and aim to capture her spirit in an ongoing dialogue involving landscapes of meaning, biographies of place, and archaeologies of compassion.

**[189] Symposium · REEXAMINING THE ANDEAN MIDDLE HORIZON FROM THE BOTTOM UP**

The Andean Middle Horizon (600–1000 CE) has traditionally been studied from a top-down perspective, where the capital and regional installations of expansionist states have monopolized interpretations. In Peru, research focusing on the site of Huari and large Wari settlements outside Ayacucho has long guided reconstructions of Wari power, suggesting that a strong Wari imperial state conquered several provinces and tightly controlled local populations. Recent archaeological research conducted at local settlements throughout Peru provides a new perspective with which to evaluate the Wari model and the Middle Horizon in general. This bottom-up approach breaks away from a monolithic conception of the Middle Horizon and moves toward a more balanced understanding that considers not only spatial and temporal diversity, but also local trajectories. In this session, participants use multiple lines of evidence to examine the many local societies that met with Wari colonists, interacted with its agents, or used some of its material culture. This research represents the need to study the role of multiple long-lived local traditions in understanding the Middle Horizon and in turn explore the ways in which they engaged, negotiated, or dealt with Wari.

**[190] Symposium · HOW WILL COVID-19 SHAPE THE FUTURE OF PUBLIC ARCHAEOLOGY?***(SPONSORED BY PUBLIC EDUCATION COMMITTEE; TEACHING ARCHAEOLOGY INTEREST GROUP)*

The COVID-19 pandemic has been a major disruptive force in our lives but also provided an unexpected spark of innovation for public archaeologists. In a time of rapid change, in-person programs were forced to pivot to virtual learning, which provided opportunities to share our discipline with new audiences, experiment with new technologies, embrace openness and inclusivity, and adopt digital accessibility best practices. Other in-person initiatives required flexibility, ingenuity, and endless last-minute adaptability. Some of these initiatives were successful while others were not, but the lessons learned will shape the future of public outreach for years to come.

**[191] Symposium · NESHER RAMLA *HOMO*: THE BEHAVIOR AND LANDSCAPE OF A MIDDLE PALEOLITHIC HUMAN GROUP IN THE LEVANT**

The Middle Paleolithic open-air site of Neshar Ramla, Israel, is located in a large sinkhole that yielded an eight-meter-thick archaeological sequence dated to ca. 140–100 ka. Quickly deposited and sealed, the deposits unveiled large and well-preserved lithic and faunal assemblages, evidence for combustion and stony features and some human remains. The latter were recently identified as a relict Middle Pleistocene *Homo* population. This session will bring together an array of studies of the site's environments and chronology, human adaptations, mobility and technology, and human remains, with the goals of, first, integrating our different lines of evidence to create a coherent picture of the archaeology of Neshar Ramla, and second, to assess the site's role in the growing Middle Paleolithic repertoire of the Levant.

**[192] Symposium · EXPLORING ANDEAN CULTURES AND CIVILIZATIONS: PAPERS IN HONOR OF RICHARD L. BURGER**

This symposium gathers invited presentations made in recognition and honor of Prof. Richard L. Burger (Yale University), in appreciation of his pivotal role in interdisciplinary archaeological research, particularly of Andean South America. The range of papers attests to the breadth and impact of his contributions across a range of fields (e.g., in field projects, archaeometry, visual arts, anthropology, heritage, and museums work), and concerning cultures and regions across the Andes (from Chavín to Machay and Inca, and including the repatriation and redisplay of the Machu Picchu collections). The presentations also showcase the influence of his mentorship of doctoral students as well as research collaborations in Latin American archaeology with colleagues from around the world.

**[193] Symposium · UNSTABLE BODIES: INTEGRATING CHEMICAL ISOTOPES AND CRITICAL THEORY IN BIOARCHAEOLOGY***(SPONSORED BY BIOARCHAEOLOGY INTEREST GROUP [BIG])*

Isotope analysis has emerged as a methodological cornerstone of bioarchaeology, revolutionizing the study of past diet and mobility. Despite a growing pace of publication, theoretical approaches to the interpretation of isotopic data have lagged behind methodological advances. While isotope analyses can yield important insights into past life experiences, they are typically performed using standard bioarchaeological variables, such as age, sex, and site, presumed to reflect some stable aspect of social

identity. Yet, the dynamic social and physiological processes through which bodily tissues incorporate isotopes underscore how identities are fluid and cumulative, transforming and consolidating over the life course. More broadly, the way isotopes circulate through air, water, soils, plants, animals, and humans expose porous material boundaries between bodies and landscapes, aligning isotopic principles with the concerns of new materialism as well as numerous Indigenous ontologies. How then can we use isotope analysis to rethink diversity in the past and complicate identity categories and ingrained concepts (such as binary gender, local vs. nonlocal, human vs. nonhuman) that may not have been salient for the people we study? This session provides a global perspective on the potentials and challenges of integrating biogeochemical data with critical theories of identity, intersectionality, materiality, and embodiment.

**[194] Symposium · ADVANCES IN ARCHAEOLOGICAL RESEARCH IN THE MOQUEGUA VALLEY I: ARCHAIC, FORMATIVE, AND MIDDLE HORIZON**

It has been more than 30 years since the publication of "Ecology, Settlement, and History in the Osmore Drainage," the first summary text on Moquegua archaeology in 1989 (Rice, Stanish, and Scarr). This publication is foundational to Moquegua archaeology and provided a great first introduction to archaeological themes in the Osmore Drainage. Since then, much work has been done in the Moquegua valley and many new insights have shaped our current understanding of the changes that occurred in the valley from the Archaic to the Late Horizon period. This two-part symposium acknowledges the work of many scholars and projects since the 1990s and presents a collection of new and updated research. In keeping with the original publication, this symposium includes contributions from various time periods and different theoretical interests. This session specifically addresses research from the Archaic, Formative period, and the transition into the Middle Horizon.

**[195] Forum · EMERGENT ISSUES IN INDIGENOUS ENGAGEMENT: A CONVERSATION WITH THE SAA TASK FORCE ON DECOLONIZATION**

The SAA Task Force on Decolonization has met regularly to consider how the Society and discipline might be transformed into a space that is welcoming and inclusive especially to Native Americans. As a discipline that works to conserve and understand material traces of the past, archaeology—in the opinion of task force members—is a "house" worth saving. Toward this end and in compliance with its charge, the task force identifies problematic issues and forwards recommendations for policy changes to the SAA board. These areas include the following: restructuring of SAA governance away from hierarchy and toward horizontal interactivity, establishing permanent representation of Native Americans on the SAA board, celebrating the centrality of Native Americans to American archaeology through an opening reception at the annual meetings, revising the SAA Code of Ethics to highlight the importance of engagement with local/descendant communities in archaeological research, acknowledging and providing guidance for intellectual property and aDNA issues that are integral to archaeological practice, framing Land Acknowledgment statements in a manner that is meaningful and a pathway to social justice, and implementing the principles of UNDRIP that have been endorsed by the SAA board. The task force invites dialogue with forum attendees about proposed changes in policy and practice.

**[196] Symposium · COLLABORATIVE AND COMMUNITY ARCHAEOLOGY**

Collaborative and Community-Engaged Scholarship (CES) is an important topic in our profession, encompassing a growing diversity of activities. We continue eight years of discussing issues and best CES practices in archaeology. This session displays a commitment to conducting research and historic preservation in effective partnership with multiple stakeholders as a matter of fairness, ethics, and as a way to create and co-create robust and useful final products. Archaeological projects affect Indigenous peoples, local residents, and descendant communities in many ways. These groups often have relatively little input into what "others" say about, or do with, their heritage. We advance inclusive, community-engaged scholarship that is co-created with relevant communities. The goal of this session and many of the projects discussed is to use community involvement and participation as a way not only to give a voice to groups that have been essentially voiceless but to empower all stakeholders—especially on projects that involve "multiple pasts." We discuss the various types of CES as defined by Doberneck, Glass, and Schweitzer (2010) including Research and Creative Activities, Teaching and Learning, Service and Practice, and Commercialized Activities. We also discuss trajectories of developing relationships and projects that can become respectful, useful, and productive CES.

**[197] General Session · CULTURAL RESOURCE MANAGEMENT AND CONSERVATION IN NORTH AMERICA**

**[198] General Session · USING ISOTOPES AND RESIDUES TO INVESTIGATE CLIMATE AND FOODWAYS**

**[199] General Session · NEW DISCOVERIES IN THE MAYA POSTCLASSIC**

**[200] General Session · SOUTH AMERICAN ARCHAEOLOGY AND GEOARCHAEOLOGY**

**[201] General Session · RECENT RESEARCH IN MESOAMERICA**

**[202] General Session · ARCHAEOLOGY OF CAVES AND ROCK SHELTERS**

**[203] General Session · HISTORIC FOOD AND BEVERAGE IN EASTERN NORTH AMERICA**

**[204] Symposium · CAA-NA SESSION: EXPANDING COMPUTATIONAL AND DIGITAL METHODS IN ARCHAEOLOGY (SPONSORED BY CAA-NA)**

Computational archaeology has been critical to the advancement of the discipline for decades. These approaches often fall into the broad categories of complex quantitative analysis and digital cultural heritage. New methods and technologies have fueled the advancement of computational approaches that enable novel research to address new questions, engage professional and public audiences in immersive ways, and inspire interdisciplinary projects that push the boundaries of our discipline. This session seeks to highlight recent computational approaches and digital methods that are shaping archaeological research and practice.

**[205] Symposium · RUINATION AND EMERGENT FUTURES: ARCHAEOLOGICAL PERSPECTIVES ON LANDSCAPES OF INSECURITY**

As archaeologists and scholars in cognate disciplines have demonstrated, the scale of destruction in the current moment is unprecedented; industrial transformations, environmental disasters, and political conflicts have resulted in damaged landscapes and have imperiled the well-being of human and nonhuman communities. Recent work by archaeologists and heritage practitioners has situated ruined landscapes as material archives of the spatially uneven effects of economic and environmental crisis. Global landscapes are strewn with damaged environments and precarious livelihoods, yet ruined, postindustrial, and postapocalyptic landscapes often support new sociopolitical figurations and new forms of multispecies life. This session foregrounds ruins as a “predicament” since their study can illuminate forms of struggle and collaborative survival in conditions of precarity. This session encourages participants to ask: How do new forms of social and material life emerge in landscapes of ruination? How might attending to emergent socio-material relationships in ruined landscapes counter discourses that position them as terra nullius? What are the problems and potentialities of researching postindustrial, postcolonial, and post-catastrophe landscapes? Session participants share their research that attends to harm and uncertainty in the modern world but also addresses how ruined landscapes may embody opportunity zones for cooperation, future building, and emergent possibilities in late capitalism.

**[206] Symposium · NEW DIRECTIONS IN MICRODEBITAGE ANALYSIS**

The analysis of microdebitage (measuring less than 6 mm) has demonstrated potential for offering compelling insights into ancient stone tool production practices, economic strategies, and the spatial organization of production. Even so, the intensive labor and costs associated with microdebitage analysis have prevented broad acceptance of this method in archaeological research, even amongst lithic analysts. Because of this, a plethora of unanswered questions remain regarding the practice of stone tool production in prehistory and the resultant formation processes of spaces where microdebitage is recovered in the archaeological record. In response, this session explores innovative methodological approaches to microdebitage analysis, such as dynamic image analysis, machine and deep learning, simulation and modeling, and chemical sourcing.

**[207] Symposium · HISTORICAL ECOLOGY AND ARCHAEOLOGY: LOOKING TO THE PAST FOR FUTURE LAND MANAGEMENT**

The land-managing agencies of the US federal government have long been tasked with the responsibility of balancing the preservation of the natural environment with projects that allow for the use of natural resources. While the protection of historic properties has been a responsibility of the federal government for decades, federal archaeologists’ potential contributions to land-management decision-making have been largely overlooked. This is despite the fact that archaeologists have developed deep time narratives of human interaction with local environments that span millennia. Historical ecology is a research program for studying the dynamic relationship between humans and their environments in the past, present, and future. The strength of this framework is the way in which it employs a multidisciplinary approach to understand human/environment relationships. This session explores the ways in which the adoption of historical ecological frameworks can facilitate federal archaeologists playing a more significant role in land management programs. We argue that by adopting a historical ecological approach, federal archaeologists will be better able to integrate their work with that of other disciplines, as well as collaborate with Indigenous communities, leading to more holistic strategies in federal land management.

**[208] General Session · RECENT ARCHAEOLOGICAL INVESTIGATIONS IN THE NORTH AMERICAN SOUTHWEST****[209] General Session · BIOARCHAEOLOGY AND MORTUARY ANALYSIS IN MESOAMERICA****[210] General Session · RECENT RESEARCH IN BELIZE****[211] Forum · SOUNDSCAPE ARCHAEOLOGY: SOUND AND EXPERIENCE IN HERITAGE RESEARCH**

Soundscape conceptualizations provide a grounding for many archaeoacoustical studies, though this term is understood differently across fields, and even within archaeology. Both in soundscape’s acoustic ecology rooting as a sound environment that exists independently of humans who can experience and contribute to it, and in its soundscape science formulation as that which can be contextually perceived by humans in a specific physical sound environment, the term “soundscape” refers to human-environmental interactions. While acoustical research methods typically focus on physical aspects of sound, cultural context—crucial to anthropological archaeology—is frequently ignored. When soundscape is addressed in archaeology, we can enliven material archaeology with sensory methodologies to answer anthropological questions in cultural heritage settings. This forum highlights approaches to “soundscape archaeology” that intersect sensory sonic concerns with heritage preservation and management, and invites a discussion of approaches to sound in archaeology.

**[212] Forum · THE ROLE OF RESEARCH IN THE AGE OF DISASTER CAPITALISM**

As big weather and other environmental disasters increase pressure on cultural and natural heritage sites, the role of the researcher comes into question. In recent years, archaeologists have born witness to external developers who have used the devastation from natural and man-made disasters to their economic advantage in what has become known as “disaster capitalism.” The term coined by Naomi Klein in 2007 has been used to describe a form of extreme capitalism that advocates privatization and deregulation in the wake of catastrophe—changes that the general population would normally resist or reject. Many communities are finding themselves at the crossroads of this multilayered barrier to recovery, which increases the marginalization and vulnerability of local peoples and environments. When communities feel alienated and disenfranchised by those creating environmental policies that directly affect their lives, and when local people are viewed by their governments as an impediment to resource management or development, what role do researchers play? At what point does research become a tool for activism or injustice? This forum examines questions of cultural identity and archaeology at a time of climate crises. Forum participants will discuss managing the balance of providing data in a politically charged world.

**[213] Symposium · ALL THINGS RECONSIDERED: NEW PERSPECTIVES ON FORAGER LOGISTICAL ORGANIZATION FROM ACROSS NORTH AMERICA**

For more than a century, archaeologists have written about how, when, and why foraging groups pattern their movements in time and space. Many of these studies have provided compelling models that have been repeatedly applied to patterns of material culture for a given archaeological culture or region. The papers in this session examine the archaeological record of past foraging societies across the Americas using innovative techniques, expanded theoretical perspectives, and/or new facets of material culture. These papers illustrate updated approaches to the archaeology of foraging people, reconsidering topics of land use, logistical and technological organization, and identity.

**[214] Symposium · LESSONS FROM THE PAST: ARCHAEOLOGICAL INSIGHTS ON ENVIRONMENTAL, ECONOMIC, AND SOCIAL SUSTAINABILITY**

Archaeological research is increasingly attuned to the needs of our contemporary society. Our collective interest in the past is shedding important light on the daily and long-term strategies that allowed for communities to thrive, but, perhaps more importantly, elucidating the deleterious and unsustainable effects of some practices. This session takes a global perspective on the ways smaller and larger-scale societies created and/or responded to environmental and social crises. As different social and economic organizations can create and react to ecological transformations resulting in distinct material correlates, this session will explore multiple lines of evidence to elucidate specific ways societies succeeded or failed in responding to change. Furthermore, environmental stability can co-occur with changes in social and economic practices that can be indicative of sociopolitical transformations. We bring together scholars to deconstruct environmental determinism and to acknowledge the tremendous impact of environmental change by focusing on a diverse array of topics including landscape management, agricultural strategies, animal management, interpersonal conflict, and hydrological infrastructure. Establishing an international dialogue around the theme of sustainability, our session has tremendous potential to bring archaeological insights and solutions to the forefront of strategies to make positive changes in the present day.

**[215] Symposium · FRESH PERSPECTIVES ON THE ARIZONA TRANSITION ZONE**

The Arizona Transition Zone, extending diagonally from the Verde River, through the Tonto Basin, to the Safford Basin, is often framed as a boundary or periphery between larger archaeological cultures. Lost in models dominated by the neighboring Hohokam, Mogollon, and Sinagua are the diverse local developmental histories of the areas comprising this zone that transcend those archaeological cultures. Frontier zones provide fascinating contexts to understand innovation and novel cultural developments, given the commonly documented movement of different groups both internally and externally, and shifting social relations with areas beyond. Leveraging contemporary studies from central and southeastern Arizona, nuance is provided for the social and cultural history of the Arizona Transition Zone. The goal of the session is to expand current conceptualizations of this zone from one of simply a boundary between culturally dominant regions to a socially rich landscape with complex social connections and multifaceted developmental histories.

**[216] Symposium · RECONSIDERING THE ARCHAIC PERIOD IN THE AMERICAS**

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

**[217] Symposium · ADVANCES IN ARCHAEOLOGICAL RESEARCH IN THE MOQUEGUA VALLEY II: MIDDLE HORIZON, LATE INTERMEDIATE PERIOD, LATE HORIZON**

It has been more than 30 years since the publication of “Ecology, Settlement, and History in the Osmore Drainage,” the first summary text on Moquegua archaeology in 1989 (Rice, Stanish, and Scarr). This publication is foundational to Moquegua Archaeology and provided a great first introduction to archaeological themes in the Osmore Drainage. Since then, much work has been done in the Moquegua valley and many new insights have shaped our current understanding of the changes that occurred in the valley from the Archaic to the Late Horizon period. This two-part symposium acknowledges the work of many scholars and projects since the 1990s and presents a collection of new and updated research. In keeping with the original publication, this symposium includes contributions from various time periods and different theoretical interests. This session includes research from the Middle Horizon to the Late Horizon periods.

**[218] Symposium · INTERNAL STRUCTURE OF LOW-DENSITY URBANISM**

The internal structure of low-density urban settlements worldwide is very varied and complex, with multiple patches of denser occupation, linear configurations, irregular and grid road networks, and extended spatially self-similar outer suburbs. These settlements, especially the great agro-urban complexes, also have elaborate, internal development histories. Through global comparisons, we seek to examine and discuss the issues of residential patterns, occupation density, spatial differentiation, internal route networks, and transformations over time in order to clarify the understanding of the dynamic of these settlements. The aim is to compare different regional traditions in the Old and the New World in order to identify common patterns and unique local residential strategies, the sources from which they derived, and their relationships to long-term outcomes. Combining the perspectives of regional uniqueness and global generality offers the potential to expand our comprehension of human settlement behavior in new ways.

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

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

**[220] General Session · MESOAMERICAN VILLAGES AND CITIES: ECONOMIC AND SOCIAL ORGANIZATION****[221] Symposium · CONDUCTING PALEOINDIAN ARCHAEOLOGY IN THE SUBMERGED CAVES OF THE YUCATAN PENINSULA**

Evidence of human activity of apparent Paleoindian age is being increasingly found in the ~ 2,000 km of flooded cave systems of the state of Quintana Roo, Mexico. More than a dozen skeletons presumed to be of this age range have been found. Extensive mining activities, focused on ochre, have been documented in multiple systems and represent intensive, prolonged labor deep within the tunnels. The environment where these discoveries are being made—located far from entrances; in darkness with overhead and underfoot hazards; submerged for at least five millennia in carbonate-rich, often saline waters; and in tropical temperatures that accelerated chemical changes and organic decay—poses immense challenges to documentation, specimen recovery, radiometric dating, conservation, and interpretation. Participants in this session, who include cave divers, software developers, engineers, geoarchaeologists, and dating experts, share the solutions they have developed for working in this unique setting and some of the findings they have achieved. (Some presentations may include images of human remains.)

**[222] General Session · ARCHAEOLOGICAL RESEARCH IN CALIFORNIA****[223] Symposium · THEORIZING CHRONOLOGY AND COLONIALISM: KEEPING TIME IN SIXTEENTH- THROUGH NINETEENTH-CENTURY INDIGENOUS NORTH AMERICA**

Existing chronological frameworks can flatten, mask, or misrepresent the temporality and nature of Indigenous experiences of colonialism in the sixteenth through nineteenth centuries in North America. Capitalist and settler-colonial logics underlie material culture-based chronologies and can advance narratives of Indigenous erasure, decline, or disruption. The recent turn toward chronological refinement in North American archaeology prompts reflection on how current and past understandings of the process of colonization in North America are entwined with the theoretical, methodological, and epistemological frameworks in which these chronologies have been enacted. In this session, contributors consider how archaeological chronologies, told in new or old ways, (re)structure understandings of Indigenous experiences and lifeways in the interconnected past and present. How do the categories to which we assign artifacts and sites shape the kinds of questions we ask of, and the conclusions we draw from, archaeological data? How have dominant theoretical and sociopolitical frameworks influenced those categories? And, in keeping with postcolonial, relational, and critical Indigenous perspectives, how can we transform the practice of "doing chronology" to better serve the interests and imperatives of Indigenous stakeholder groups? Contributions to this symposium include theoretical discussions and case studies which consider these questions in concise and creative ways.

**[224] General Session · MIDDLE AND LATE HORIZON ARCHAEOLOGY IN THE ANDES****[225] General Session · ARCHAEOLOGY OF RITUAL AND SYMBOLISM****[226] General Session · MEDITERRANEAN ARCHAEOLOGY****[227] Symposium · NORTHERN ONEOTA MANIFESTATIONS: TWO DECADES OF RESEARCH IN THE MIDDLE FOX AND WOLF TRADITION LOCALITIES**

The last two decades have seen a renewed focus on Oneota research in the Middle Fox and Wolf River localities. Much of this work has been conducted for historic preservation compliance or through reevaluations of previously excavated collections. As a result of these projects, many interpretations of Oneota manifestations in the region have shifted or become more nuanced. Through a combination of case studies and regional analyses, the papers in this symposium will highlight the outcome of two decades of new Oneota research in northeastern Wisconsin.

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## Participants—Individual Abstracts

**Abdolahzadeh, Aylar (University of Pennsylvania) and Mareike Stahlschmidt (Max Planck Institute)**

[20]

*A Controlled Pilot Experiment to Test the Impact of Freezing on Flint Artifacts*

Frost-weathering is another type of taphonomic mechanism that relocates artifacts from the archaeological contexts, changes original color of flakes, and develops microcracks inside flakes. Except for a few studies that have discussed the impact of frost-weathering on natural rocks and stone tools, controlling the effects of frost weathering alterations and fracturing on flakes has not been studied widely. This paper presents the results of controlled frost-weathering experiment on knapped flakes (flint) designed to control the effect of increasing freeze and thaw cycles on flake's external and internal surface alterations. We used a laboratory digital freezer (Thermos Scientific TSX-series ultra-low) to control for temperature and duration of freezing. Using this controlled setting, the primary objective of this experiment was to first identify specific signature features of frost-altered flakes with a goal of increasing the level of accuracy in distinguishing lithics impacted by frost-weathering from the effects of other natural processes in lithic assemblages. This is especially pertinent in colder places (non-Mediterranean Europe) where freezing climatic conditions are more likely to characterize site locales.

**Abell, Jordan (University of Arizona), Jay Quade (University of Arizona), Mary Stiner (University of Arizona), Susan Mentzer (Senckenberg Centre for Human Evolution and Palaeoenvironment) and Mihriban Özbasaran (Istanbul University)**

[16]

*Urinating in the Neolithic: Geochemistry at the Aceramic Neolithic Site of Aşıklı Höyük, Turkey*

Over the last several decades, there has been an increasing interest in the application of geochemistry to archaeological sites, with studies focusing on a range of topics including use of space and identifying specific archaeological deposits. We recently developed a novel, holistic geochemical approach that determines the soluble-salt chemistry of the Aşıklı Höyük tell in central Turkey, and uses the data in a mass balance model to estimate the timing and scale of animal management. By combining our new geochemical data with radiocarbon dates and archaeological context, we find evidence that supports expanding animal management through the ~1,000-year occupation of the site, consistent with previous interpretations based on zooarchaeological data. Additionally, we constrain the timing of the largest increase in animal husbandry to between Levels 4 and 3, which corresponds to ~10,300 to 9,700 years before present. Our methodology can be applied to other archaeological sites in arid regions, not only to questions of animal domestication, but to research on site-use intensity as well. Mary Stiner played a key supporting role in developing this new method, a nice illustration for today's special session dedicated to Mary of how multidisciplinary science can provide novel answers to archaeological questions.

Abrams, Georgia [159] see Rucinski, Hannah

Acabado, Stephen [143] see Rodning, Christopher

**Acuña, Mary Jane and Carlos Chiriboga (Yale University)**

[153]

*Archaeological Palimpsests and Pentimenti: The Late Classic Occupation at El Tintal, Petén, Guatemala*

Initially settled sometime in the earlier portion of the Middle Preclassic period, by 600 BCE the inhabitants of El Tintal, located in northcentral Petén, Guatemala, launched a series of long-running monumental architectural programs and engineering works which would continue until around 200 CE. These monumental projects drastically altered the landscape and would influence successive occupations at the site for centuries later. In the Late Classic period (550–800 CE) El Tintal experienced a second cultural apogee, with a substantial population inhabiting the site. Construction activity augmented rapidly after 550 CE, not only in the core with civic and ceremonial architecture, but everywhere with a notable increase in the number of residential households and expansion of the settlement area. In this presentation, we review the evidence for that time period, highlighting major finds that help us understand more about the cultural and sociopolitical dynamics of the population, as well as the broader regional contextualization within lowland Maya archaeology.

**Adams, Betty, Mario Zimmermann (Washington State University) and Jennifer Hebley (La Sierra University)**

[18]

*Nondestructive LC-MS Residue Analysis Yields Data in Field Lab Experiments Consistent with Institutional Lab Testing on Cosmetic Artifacts from Ancient Near East*

In 2018 we recognized the need to develop extraction protocols that would function in a lab setting and the field for nondestructive residue analysis on artifacts that must remain in the country of excavation. We focused on untested stone cosmetic palettes from six geographically dispersed sites in Jordan, utilizing recently excavated materials as well as cosmetic palettes and mortars stored up to 40 years in museums. Using LC-MS and multivariate statistics, we track compound presence on cosmetic artifacts through time (Late Bronze Age to Persian) and across different locations. For comparative purposes, we analyzed household artifacts from Khirbat Al-Balu'a in 2019. Currently, we are integrating the ancient metabolomics approach with modern references to compare the

*Presentations and posters that were officially withdrawn by March 2, 2022, the advance registration deadline, have been marked as [WITHDRAWN] in the Individual Abstracts; however, these presentation/poster placeholders will still appear in the Final Program. Updated information regarding withdrawals will be provided in Daily Digest e-mail updates during the meeting.*

chemical signatures of oils, aromatics, and medicinal plants with artifact clusters and infer usage within a variety of find contexts, such as households, tombs, and administrative centers. Our long-term goals are to explore the link between residue data, regional cosmetic trade networks, and cultural continuity of cosmetic tools and adornment practices.

Adams, Donovan [193] see Toyne, Jennifer Marla

**Adams, Jake (USDA Forest Service)**

[83]

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

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

Adapa, Swamy Rakesh [111] see Vianello, Andrea

**Admiraal, Marjolein (University of York), André Carlo Colonese (Universitat Autònoma de Barcelona), Dione da Rocha Bandeira (Universidade da Região de Joinville), Deisi Scunderlick Eloy de Farias (University of South Santa Catarina) and Oliver Craig (University of York)**

[63]

*Insights into Long-Term Pottery Use in Southeastern South America from Organic Residue Analysis*

The southern Atlantic Forest coast of Brazil has preserved a rich archaeological record of mixed economies that endured over extensive geographic areas during the Middle and Late Holocene. Subsistence of some groups involved substantial dependence on marine resources. The introduction and widespread use of ceramic technology from ca. 2000 cal BP has conventionally been considered a proxy for agricultural practices, a key turning point in exploitation of aquatic resources. However, studies have shown that early ceramics (Taquara-Itararé tradition) were used by groups who supposedly intensified fishing, rather than plant cultivation. At around 600 years ago Guarani groups introduced new and more complex ceramic artifacts as part of their plant-based economy. Ethnographic and historical records describe several uses for Guarani pottery, notably for processing plant products such as maize. However, this has never been tested on precolumbian archaeological samples from these coastal sites. As part of the ERC-CoG funded TRADITION project (817911), we present the results of the first large-scale molecular and stable isotope analysis of precolumbian ceramic artifacts from the southern Brazilian coast. Our analysis reveals a sharp shift in pottery function reflecting the different economies of Taquara-Itararé and Guarani groups.

**Admiraal, Marjolein (University of York)**

[135]

*Discussant*

Admiraal, Marjolein [64] see Colonese, André Carlo

**Adovasio, J. M. (Senator John Heinz History Center) and Tom Dillehay (Vanderbilt University)**

[57]

*Early Basketry from Huaca Prieta, Peru*

Huaca Prieta is a very deeply stratified, open site on the north coast of Peru. Long famous for its spectacular earthen and stone pyramid and originally excavated by J. Bird, recent excavations conducted by T. Dillehay have produced some of the earliest basketry yet recovered from anywhere in South America. This basketry is described, and date ranges are provided. Possible functions are also addressed.

Agam, Aviad [149] see Finkel, Meir

**Agarwal, Sabrina (UC Berkeley)**

[75]

*Discussant*

**Agbe-Davies, Anna (UNC-Chapel Hill) and John Eric Deetz (UNC-Chapel Hill)****[182]***Historical Archaeologies of the Phyllis Wheatley Home for Girls, Chicago*

The Phyllis Wheatley Home for Girls on Michigan Avenue was one of several homes established by the Phyllis Wheatley Club (ca. 1907–1970) to provide safe lodging and vocational training for young African American women who were escaping the limitations of the south and hoping for opportunities in Chicago. Historical documents, archaeological findings, and architectural analyses have all contributed to our understanding of the types of mitigation resorted to by the Home's residents, administrators, and supporters while negotiating the fluid racial landscape of Chicago's South Side.

**Agbe-Davies, Anna (UNC-Chapel Hill)****[165]***Discussant*

Agenten, Courtney [146] see Piscitelli, Matthew

**Agostini, Mark, Judith Habicht-Mauche (University of California, Santa Cruz) and Rob Franks (University of California, Santa Cruz)****[41]***Ancestral Pueblo Pottery Production at San Gabriel del Yungue Owingeh*

This poster presents on a preliminary chemical analysis of ancestral Tewa Pueblo pottery ( $n = 30$ ) from San Gabriel del Yunque Owingeh. The archaeological village of San Gabriel, a National Historic Landmark, is located on the Rio Grande in the northern region of what is now Ohkay Owingeh Pueblo, New Mexico, and was settled in 1599 as the second Spanish capital in the New World. Historically, archaeological studies at San Gabriel emphasize the Spanish occupation and the use of Native objects by early colonists. This research instead seeks to better understand how the daily lives of Native peoples were impacted by early colonization and missionization at San Gabriel. Analysis of pottery recovered by Bertha Dutton and Florence Hawley Ellis's excavations at San Gabriel was conducted using quadrupole inductively coupled plasma-mass spectrometry (ICP-MS). This technique precisely measures trace elemental concentrations, which can be used to model changes in socioeconomic interactions and resource procurement strategies prior to and during the early years of San Gabriel. Preliminary findings suggest the presence of a diverse prehispanic network of pottery production and circulation at San Gabriel that is later marked by increasing ceramic specialization on the eve of Spanish rule.

**Aguayo, Esther (UC Riverside), Nawa Sugiyama (UC Riverside), Yen-Shin Hsu (Smithsonian Institute) and Christine France (Smithsonian Institute)****[201]***Teotihuacan and the Missing Staple: An Analysis of Deer Use at Plaza of the Columns Complex*

This presentation examines the dynamic food system of Teotihuacan (150 BCE–550 CE) in central Mexico and the supporting dietary role of the white-tailed deer (*Odocoileus virginianus*) for the Teotihuacan people. While deer were the largest mammal in the precolumbian world and a critical food source for other Mesoamerican urban centers, they are virtually absent at Teotihuacan, representing just 11% (MNI) of the city's fauna (Sugiyama et al. 2017). Prior research determined that, despite an estimated population of over 100,000 people at its height, even commoners in Teotihuacan had access to adequate protein. This investigation details the even scarcer distribution of deer elements (3.9% NISP) at the Plaza of the Columns Complex (PCC), a centralized palatial-administrative complex. The spatially concentrated distribution at PCC demonstrates that deer were not underutilized as food, but instead limited to specific contexts, with the best evidence of consumption being an offering and feast. Non-ceremonial contexts show that deer elements were more suitable for tool making. Analyses of anthropomorphic surface modification and stable isotopes to determine diet and provenance of deer compared to more abundant fauna provide a comprehensive view of food acquisition and animal exploitation at Teotihuacan and broaden understanding of food systems necessary to feed large populations.

Agudelo Bermudez, Andres [78] see Rodriguez Osorio, Daniel

Aguilar, Karla [123] see Frykholm, Soren

Aguilera Rosales, Marlen [82] see Goodwin, Whitney

Aguirre Molina, Alejandra [128] see López Luján, Leonardo

**Ahern, Kaitlin (University at Buffalo)****[169]***Ancient Maya Defensive Hilltop Structures and the Atalaya*

Recent excavations conducted at the Atalaya complex located in East Witzna revealed the early construction of a watchtower in the Holmul region during the Late Preclassic period. This discovery indicates the presence of early warfare in the region that continued into the Late Classic period. The Atalaya was utilized through multiple waves of warfare and its occupation ultimately ended after an act of warfare that burned most of the architecture and floors. This recent find adds to a growing number of publications that explore

the use of defensive hilltop locations and watchtowers by the ancient Maya throughout the Preclassic and Classic periods. This presentation also provides an overview of defensive hilltop structures among the ancient Maya with the goal of contextualizing the new findings associated with the Atalaya.

**Ahlman, Todd (Texas State University) and Ashley McKeown (Texas State University)**

[44]

*The History and Archaeology of the St. Croix Leper Hospital, St. Croix, US Virgin Islands*

In 1888, the Danish government established a leper hospital on the Caribbean island of St. Croix. By 1903, the facility was considered insufficient for the number of people and the conditions were substandard. A new facility, built by the International Order of Odd Fellows, opened in 1909, which was updated and expanded by the US government in 1934. The facility closed in 1958 as the last patients were treated or moved to another facility. In the 1960s, some of the buildings were removed to make way for a housing development. Archaeological and historical investigations funded by the National Science Foundation Research Experiences for Undergraduates were undertaken in 2020. Students from across the United States conducted archaeological investigations to identify structural remains from the 1909 facility and standing structures from the 1934 rebuild. Four 1934 buildings and one 1909 foundation were identified and geophysical survey suggests that subsurface remains exist in several locations. These investigations seek to shed light on colonial healthcare in the late nineteenth and early twentieth century in the Caribbean.

Ahlman, Todd [166] see Bowden, Taylor

**Aimers, Jim (SUNY Geneseo)**

[110]

*Mesoamerican Urban Form*

Mesoamerica is well-known for its extensive urban tradition yet surprisingly little has been written regarding urbanism and cities in Mesoamerica generally. The discussion that follows concerns the most basic elements of settlements in the area and examines the idea that the city on the broadest scale can be approached as a system of communication. Topics include code-based and expressive aspects of Mesoamerican urbanism, siting, orientation, planning, housing, and ceremonial architecture. Comparisons are made from sites across Mesoamerica.

**Aimers, Jim (SUNY Geneseo)**

[110]

*Chair*

**Ainis, Amira (University of Oregon MNCH and SWCA Environmental Consultants), Antonio Porcayo-Michelini (INAH, Mexico), Rene Vellanoweth (California State University, Los Angeles), Raquel Hernández Estrada (INAH, Mexico) and Richard Guttenberg (JMA)**

[131]

*Shell Mounds on a Desert Shore: Constructed Cultural Landscapes of the Upper Gulf of California*

Shell midden sites along the upper Gulf of California have only recently received attention, negating a clear understanding of the relationships between these constructed coastal landscapes and the lifeways of Indigenous people in the past. We provide a summary of recent investigations at shell midden sites along Baja California's upper Gulf Coast to establish a preliminary landscape history for the area through chronology building and demonstrate the repeated use of shell-bearing sites by various culture groups through time. These data provide a framework for more nuanced interpretations emphasizing the cultural role and importance of shell middens as actively engaged in places of meaning. The often-repeated use of some of the larger multicomponent middens and specific coastal stretches suggest they hold a key place of value in collective repeated memory and identities allowing them to serve as cultural keystones that are revisited and reaffirmed through time. Conceptualizing shell middens as constructed cultural landscapes adds value to a site type often ignored in heritage preservation. As sea levels rise, shell middens around the world are subject to increased levels of coastal erosion. We provide an example of this problem by highlighting the effects of a single storm surge on a coastal midden.

**Aitchison, Kenneth (Landward Research Ltd)**

[170]

*Professional Archaeology in the UK under COVID-19*

The effects of the COVID-19 pandemic began to be felt in professional archaeological practice across the United Kingdom in March 2020. This paper reviews the effects this has had on working practices and employment in compliance-led UK archaeology, looking at how private sector contractors and local government regulators adapted and cooperated to manage in a dynamic and unprecedented situation. After an initial lull—no-one dared hire or start new projects in the spring of 2020—the pace of work suddenly accelerated to unexpected levels. From the summer of 2020 onward, commercial archaeology in the UK has never been busier as the construction industry, spearheaded by major infrastructure projects, recovered extremely rapidly from the shock and continued to deliver at pace. When government-funded furlough and working from home became norms, development-led archaeology was under pressure to adapt in order to protect lives and livelihoods while continuing to deliver for clients and the public. And this was then in the face of being simultaneously hit by a crushing labor shortage, partly fuelled by the UK's near-simultaneous departure from the European Union resulting in the loss of a reservoir of skilled workers that the sector had previously benefited from.

**Aiuvalasit, Michael (Illinois State Archaeological Survey, University of Illinois), Caitlin Rankin (Illinois State Archaeological Survey) and Timothy Pauketat (Illinois State Archaeological Survey)****[15]***Using Soil Micromorphology to Reevaluate Cahokia's Sub-Mound 51 Borrow Pit Formation*

The analysis of 17 soil thin sections recently prepared from a soil monolith collected by Charles Bareis as a part of his sub-Mound 51 borrow pit excavations (1966–1972) are allowing us to better understand the formation of this significant Lohmann phase (AD 1050–1100) feature at Cahokia. Pauketat et al. (2002) conducted detailed analyses of the extremely well preserved archaeological materials from this feature, and interpreted its fill sequence to be a series of depositional events tied to large-scale feasting, disposal, and subsequent mound construction. Micromorphological analyses largely confirm the original stratigraphic interpretations, and that repeated burning events occurred early in the fill sequence. While it is likely that the feature was rapidly filled, direct microstratigraphic observations indicate that layers interpreted as massive disposal and fill events may reflect multiple episodes of deposition. In addition, observations of artifacts and microartifacts in thin section aids in the interpretation of the disposal patterns tied to large-scale social events at Cahokia.

**Alaica, Aleksa (University of Toronto)****[85]***Guinea Pigs and Community Health: Insights from the Middle Horizon Period (CE 600–1000) of the Cañoncillo Archaeological Complex, North Coast, Peru*

Guinea pigs were and remain important sources of food in the Andes. They are also essential parts of healing and divination practices throughout the region. During the Middle Horizon period (CE 600–1000), guinea pigs were large components of faunal assemblages both as disarticulated remains and as complete offerings. This paper focuses on the Cañoncillo Archaeological Complex of northern Peru to explore the shifting care and management of guinea pigs as reflecting larger transformations in social structures and interregional exchange. Commensal species are powerful proxies for human diet, thus providing an important line of evidence for daily subsistence strategies and the incorporation of plant cultigens. Particularly relevant to this session, guinea pigs were a unique commensal species because they held an integral role in sacrificial rites and as proxies for community health. Zooarchaeological and isotopic analyses were employed to examine guinea pig remains from the Late Moche site of Huaca Colorada (CE 600–900) and Transitional site of Tecapa (CE 850–1000) to explore the diachronic transformations in management and exploitation of guinea pigs in daily and ritual contexts. I argue that beyond food sources guinea pigs were highly valued animals for their ceremonial use and as proxies for community health.

**Alaica, Aleksa (University of Toronto)****[214]***Discussant***[214]***Chair*

Alaica, Aleksa [157] see Gonzalez La Rosa, Luis Manuel

**Alarcón Tinajero, Edgar (University of Georgia)****[223]***Amid Plague and Conquest: Assessing Community Continuity in Early Colonial San Gregorio Atlapulco through Radiocarbon Chronology*

During the 1980s, Parsons and colleagues excavated the archaeological site of El Japón in the Xochimilco area of the southern Basin of Mexico which they identified as a hamlet from the late Postclassic with limited postcontact occupation. Ávila López and colleagues excavated the site cemetery in the 1990s where they identified more than 380 individuals in austere burials in an arrangement consistent with postcontact churchyards. Radiocarbon dates, Bayesian modeling, stratigraphic provenience, and reference to historical documents in this ongoing study places human burials from El Japón cemetery between the 1560s and 1640s CE, well after the onset of Indigenous population relocation to larger settlements: *congregaciones*. The refined chronology identifies occupation of the rural settlement in a time where prevailing historical discourse may lead to expect abandonment of the relatively remote location. The radiocarbon chronology for El Japón contextualizes ongoing study of individual-level bioarchaeological proxies that begin to indicate persistence in diet and physical labor patterns despite European contact and concomitant demographic decline.

Albarrán Reyes, Rocío [55] see Schieber G de Lavarreda, Christa

**Albert, Rebecca (University of California, Santa Barbara) and Susan Kooiman (Southern Illinois University, Edwardsville)****[119]***Analyzing Modern Soils to Assess Contamination Risk in Microbotanical Analysis***[WITHDRAWN]**

Alburquerque, Ricardo [189] see Cusicanqui, Solsiré

**Alconini, Sonia (University of Virginia)****[124]***Chunchos, Kallawayas and Puquina-Arawak: Transformations and Continuities in the Tawantinsuyu*

The province of the Chunchu, whether a reality or in process of formation, was an important region of the Antisuyu quarter. Extending between the Madre de Dios River and southern Apolobamba, it comprised a myriad of ethnic groups that maintained different relations with the Inkas and its predecessors. One of such groups were the Kallawayas, who maintained active trading and kin relations with other Puquina and Arawak-speaking communities that dwelled along extensive corridors that linked the altiplanic Titicaca basin with deep Amazonia. This paper presents the results of regional-scale pedestrian surveys, analysis of architecture and cultural materials, and documents the critical role that the Kallawayas region played in the provisioning of critical resources, medicinal knowledge, and the bidirectional transfer of peoples to Tiwanaku, and later, the Inka Empire. This research has implications to understand the role that seemingly marginal frontier regions played in the broader Inka imperial economy.

**Alconini, Sonia (University of Virginia)****[84]***Discussant***[124]***Chair*

Alconini, Sonia [87] see Bruno, Maria

**Aldama, Wilder (Universidad Nacional de Trujillo) and Gabriel Prieto (University of Florida)****[155]**

*The Red Tide: Procurement, Uses, and Symbolism of Red Pigments during Prehispanic Times in Huanchaco, North Coast of Peru*  
Red pigments have been used by Huanchaco people since the early Initial period (1500–1200 cal BC) for domestic and ritual purposes. Previously, one of us reported that in Huanchaco there is the earliest occurrence and use of cinnabar in the prehispanic Andean region. An open question emerged, whether later populations continued using red pigment for ritual purposes. The excavation of residential sites and cemeteries occupied between 400 cal BC and 1450 cal AD in Huanchaco have yielded new evidence on the uses of red pigments. In 2019, 15 samples were successfully analyzed in Trujillo (Peru) and Bordeaux (France) using SEM-EDS, VIS reflection spectroscopy and CIE L\*a\*b\* Color measurements, Raman spectroscopy, and XRD. The results of these analyses suggest that the early Initial period exploitation of local mines continued as well as the connection with the distant cinnabar source of Huancavelica. More interesting, there seems to be new sources that have been exploited through time, as well as gradual decrease in the uses of red pigment over time. Other aspects such as gender and the “right” to use red pigment by certain members of the Huanchaco community, seems to have played a role in its uses and symbolism through time.

Aldeias, Vera [98] see Barbieri, Alvise

Aldeias, Vera [60] see McPherron, Shannon

**Aldenderfer, Mark (University of California)****[194]***Programa Contisuyo and the Archaic Period in the South-Central Andes*

Prior to the creation of Programa Contisuyo in the early 1980s, almost nothing was known of the Archaic period in the Osmore drainage, and little more was known of the early archaeological cultures of southern Peru. Over the years, researchers working under the aegis of Programa Contisuyo and its descendants have expanded our understanding of Archaic period adaptations from the coast to the puna and have built an impressive corpus of data that encourages comparative research within and beyond the Andes. In this presentation, I will review the most salient of these findings, place them into a regional framework, and will discuss what we still need to learn about these early peoples.

**Aldenderfer, Mark (University of California)****[51]***Discussant*

Aldenderfer, Mark [10] see Meyer, Michael

**Alders, Wolfgang (University of California, Berkeley)****[106]***Uneven Ground: Settlement Reorganization in Zanzibar, Tanzania, from 1000 to 1900 CE***[WITHDRAWN]****Aleksandr, Popov****[135]***Discussant*

Aleru, Jonathan [106] see Ogundiran, Akin

**Alex, Bridget (California Institute of Technology), Rowan Flad (Harvard University) and Jenny Ji (California Institute of Technology)****[148]***Examining the Regional Scope of Archaeology Coverage by US Media: Is Anti-Asian Bias Evident?*

In spring 2021, two major archaeological finds were announced by archaeologists in Egypt and China in the same week. One of these, discoveries related to the city of Aten of Egypt's 18th Dynasty, received attention in US media sources. The other, the unearthing of several large sacrificial pits containing gold, ivory, jade, and other precious objects at the site of Sanxingdui, was widely covered by Chinese press, but not reported in US media. An OpEd in the *Washington Post*, written by one of us, pointed to this as an example of anti-Asian bias in US media coverage of archaeology. This study aims to empirically test that claim. We identified archaeology research papers published in leading scientific journals across several years. We then evaluated the attention these papers received in mass and social media based on Altmetric data quantifying news coverage and Twitter mentions. Comparing media exposure given to research from different geographic regions, we assess whether anti-Asian bias is evident in popular uptake of archaeological discoveries.

Alexander, Clara [199] see Hannold, Cynthia

**Alford, McKenzie****[114]***Virtual Preservation of Archival Media from the Historic Freedman Sites of the Richland Creek Archaeological Project (Freestone and Navarro Counties, Texas)*

This poster focuses on the importance of digitization for the virtual preservation of archival materials. Southern Methodist University (SMU) Archaeological Research Project (ARP) investigated 106 prehistoric and historic sites from 1980 to 1984 as part of the Richland Creek Archaeological Project (RCAP) in anticipation of impoundment by the Richland/Chambers Reservoir, Freestone and Navarro Counties, Texas. Optimal storage of these items including archival-quality sleeves, acid-free containers, and proper temperature regulation helps preserve the original archived materials for future use. However, digitization of print media goes one step further. It not only preserves important information about sites, but it also improves accessibility and dissemination of archaeological information to descendant communities, researchers, and the public. This poster presents digitized material from portions of the project related to the nineteenth-century Black homesteader's experience in central Texas in order to demonstrate the relevance of virtual preservation in a post-pandemic world. Work is part of a larger initiative by SMU's Archaeological Research Collections to showcase future research on Freedman's sites.

**Alhambra, Dominique (Denver Museum of Nature & Science) and Baylee Hughes (Denver Museum of Nature & Science)****[197]***Making Order from Disorder: How Rehousing Can Transform Access to Archaeological Collections*

How does an institution start to create a plan to tackle a significant backlog of unprocessed collections? How can staff quickly, easily, and safely retrieve artifacts for a research request? When rehousing archaeological material, there are common problems that any repository may encounter, including inventory discrepancies and data cleanup, minimal staffing and resources to maintain care of objects, and inadequate space to safely house archaeological material. In 2017, the Denver Museum of Nature & Science received a \$300,000 National Endowment for the Humanities Sustaining Cultural Heritage Collections grant (PF-255862-17) to sustainably preserve its entire archaeology collection. Completed in 2021, we will discuss the challenges we encountered and important lessons learned, including prioritizing what to rehouse first; finding new ways to rehouse small items to reduce storage capacity, implementing a new barcoding system; and adapting to the COVID-19 pandemic by shifting from a large volunteer corps to one full-time staff person. This presentation will share problem-solving strategies to benefit other archaeology collections repositories looking to improve access to their collections.

Ali, Zara [166] see Shev, Gene

Alix, Claire [31] see Mayeux, Camille

**Allard, Francis (Indiana University of Pennsylvania)****[181]***The Early Maritime Silk Road: A View from the South China Sea and Southeast China*

Previous views of early maritime travel south of China were in part guided by a brief textual reference to merchants from China possibly reaching India by about 100 BCE. More recently, archaeological evidence has pointed to second and first millennium BCE networks of interaction operating in the South China Sea, an unsurprising finding of coastal or open water navigation considering the even earlier Austronesian expansion from Taiwan. By the middle of the first millennium BCE, archaeology indicates more regular interaction between the South China Sea and the Bay of Bengal, the latter a source of objects such as stone and glass beads (although local production in the former also occurred). Importantly, the available data—including that recovered from burials at the coastal site of Hepu in Guangxi—points to China being a late participant in preexisting exchange networks to its south. Furthermore, the clearly uneven spatio-temporal patterning emerging from such data alerts us to the fact that the South China Sea's coastal areas were not equal participants in such networks and that environmental and other geographical factors (e.g., distance, monsoons, currents, coastal geomorphology) likely played a role in shaping the nature, extent, and impact of regional maritime interaction.

**Allaun, Sarah (University of Wyoming) and Todd Surovell (University of Wyoming)****[120]***Modeling the Colonization of Oceania and Beyond*

As long as there have been uninhabited landscapes on Earth, humans have sought to explore and settle them. Variation in the discovery, reconnaissance, and ultimate colonization of Earth's landscapes highlights the factors linked to processes of colonization. The simulation of colonization events allows for the exploration of the effects of variation in particular variables on colonization outcomes. The colonization of Remote Oceania serves as an interesting case study where human migration and ultimately successful settlement of islands across vast empty oceans is linked to the demographic, technological, and geographic factors that serve to both permit and inhibit the movement of people. In this project, I build on a simulation of colonization of Remote Oceania to develop an explicit understanding of the roles of technology, population growth, and geography in the human settlement of the Pacific. I then turn that simulation into a 3D model to explore an analogous future colonization event: the human settlement of the Moon, Mars, and beyond. My aim is to explore how movement of our species beyond the confines of the planet can be informed by the archaeological record.

**Allaun, Sarah (University of Wyoming)****[120]***Chair*

Allaun, Sarah [117] see Mahan, Chase

**Allen, Mitchell (University of California Berkeley)****[183]***Visual Sistan: Archaeological Photographs and Landscape Change in Southwest Afghanistan in the Twentieth Century*

Visual images have always been an essential part of archaeological research and reporting. Looting, urban development, landscape changes, and other changes to the visible shape of archaeological sites has led archaeologists to search for historical photos, usually buried in archives, to provide more historical depth to current archaeological projects. One of the tasks of the Helmand Sistan Project, which surveyed southwest Afghanistan in the 1970s and is only now being published, was to attempt to re-create some historical photographs of the region to document natural and human-made changes. We were able to secure photos from the archives G.P. Tate, who worked with the Afghan Boundary Commission in 1903–1905, and from the French archaeological mission that surveyed Afghan Sistan in the mid-1930s. About 100 of these historical shots were re-created in the early 1970s by HSP photographer Robert K. Vincent Jr. This presentation will show some of these photographs, taken 40 or 75 years apart, and examine what this form of replicative visual archaeology can add to the researcher's toolkit and to our understanding of natural and human processes in Afghan Sistan.

Allen, Shannon [24] see Wampler, Marc

**Allen, Susan (University of Cincinnati)****[147]***Discussant***Allison, James (Brigham Young University), Fumi Arakawa (New Mexico State University), Marion Forest (Arizona State University), Katie Richards (Washington State University) and David Yoder (Weber State University)****[225]***Megaliths and Monumental Architecture at Coal Bed Village, an Ancestral Pueblo Site in Southeastern Utah*

Worldwide, megaliths are a common form of monumental architecture in Neolithic and later societies. Archaeologists in western Europe, and other parts of the world where megalithic monuments occur, have often discussed the meanings of megalithic features as well as their associations with ritual, territoriality, and social organization. In the Pueblo Southwest, most monumental architecture takes the form of large, unusually tall buildings ("great houses"), oversized ritual architecture ("great kivas"), or landscape features (roads and berms), all of which are most commonly associated with the Chaco system. Ancestral Pueblo people also occasionally built with ostentatiously large rocks, but megalithic features and their associations have received little attention from southwestern archaeologists. At Coal Bed Village, a large Ancestral Pueblo ruin in southeastern Utah that dates to the AD 1200s, a row of large standing stones is associated with other forms of monumental architecture, including several great houses. Megaliths are also used in other contexts: as part of a site-enclosing wall, in apparent ritual contexts, or less visibly incorporated into expediently built great house walls. Access to the site was channeled through spaces where megalithic features and monumental buildings were designed to impress.

**Allué, Ethel (IPHES)****[191]***Woody Vegetation and Firewood at Neshar Ramla: A Contribution from the Charcoal Analyses*

This presentation aims to contribute data to the discussion on the environment and human fuel uses during the Levantine Middle Paleolithic. In the Levantine early and mid-Middle Paleolithic (MIS 7 to MIS 4) charcoal remains are very scarce. The charcoal assemblage from Neshar Ramla is one of the exceptions of macro-charcoal assemblage identified so far in the Levantine Middle Paleolithic. The anthracological (charcoal analyses) is focused on the interpretation of the charcoals left by fires retrieved from layers II to VI dated to the MIS5e. The identification of the remains was based on the observation of the wood anatomy using a metallographic microscope allowing the identification of deciduous *Quercus* sp. (oaks) and *Prunus* (plums). These taxa represent

the arboreal cover near Nesher Ramla growing under relatively humid and mild environmental conditions, which is in accordance to general local and regional climatic and environmental records. Although limited due to the low amount of charcoal, the evidence from Nesher Ramla clearly indicates the presence of arboreal taxa that was available as firewood. The presence of trees suggests that human groups had access a diversity of resources, thus favoring recurrent settlement of the area.

Almeida, Fernando Ozorio de [25] see Kater, Thiago

Alonzi, Elise [157] see Scaffidi, Beth

**Alperstein, Jonathan (Dartmouth College), Petra Creamer (Dartmouth College), Carolin Ferwerda (Dartmouth College), Madeleine McLeester (Dartmouth College) and Jesse Casana (Dartmouth College)**

**[160]**

*Locating New England's Woodland Villages: Landscape-Scale Geophysics in the Upper Connecticut River Valley*

Although archaeologists and historians have long inferred the existence of semi-sedentary, agricultural villages throughout much of New England, there is little evidence in the archaeological record for Woodland village sites (~900–1600 CE) in the region. As part of a new research project focused on the Historic Oxbow district of the Connecticut River Valley in Vermont and New Hampshire, this poster presents results of pilot study that employs large-scale geophysical surveys to locate potential Woodland village sites. This area is of particular interest as the location of Cowass, a historically recorded settlement of the Ko'asek/Co'wasuck band of the Western Abenaki, who occupied the region for centuries. Initial surveys are being undertaken using a SENSYS multisensor magnetometry cart, enabling rapid data collection over large areas, and magnetic anomalies of interest are then further explored using ground-penetrating radar and electrical resistivity. Results have begun to reveal the location of Woodland-era habitation features, including house basins, storage pits, and hearths, demonstrating a successful method for locating ephemeral traces of past settlement and offering new insights into village life of the Indigenous Northeast.

Alsgaard, Asia [190] see Woodhead, Genevieve

**Alsharekh, Abdullah (King Saud University)**

**[102]**

*The Engraved Axes: A Unique Rock Art Site in Southwest Saudi Arabia*

**[WITHDRAWN]**

**Alt, Susan (Indiana University Bloomington)**

**[15]**

*Women, Water, and Cahokia*

Cahokia, the first urbanization north of Mexico, was emplaced on a floodplain surrounded by a karst topography riddled with caves, underground tunnels, water features, and aboveground sinkholes. This was no mere happenstance; this landscape is what imbued Cahokia with special powers and authority through a relationship to water and portals to the underworld. These forces also powerfully implicate women and feminine powers in Cahokian doings. I review Cahokian history through a lens of ethnography, Native scholarship, and archaeological evidence to illuminate Cahokians,' and particularly women's, special relationship to water, underworld portals, and otherworldly forces.

Alt, Susan [15] see Pauketat, Timothy

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

**[219]**

*The Once and Future Promise of CRM*

I chose CRM over academics to be relevant. I wanted to be part of the public debate about the balance between historic preservation and economic development. In the ensuing 45 plus years, I find much to be proud of. CRM archaeologists identified lots of sites, saved or excavated those that were important, empowered local and Indigenous communities to be part of the process, and learned much about what happened in history. CRM evolved from a fledgling enterprise to a mature industry. What once was a temporary way station is now a career path for more than 10,000 archaeologists in the United States. I'm also frustrated with what we didn't do. We learned a lot about a little, spending our days analyzing and interpreting the remains within project boundaries mostly drawn by others. Rarely did we try to put things together on temporal and spatial scales that did much more than fill in dots in regional culture histories. Now, in the twilight of my career, I feel compelled to take on one last initiative: to leverage the vast amount of data we collected to address pressing social issues from a long-term perspective that only archaeology can provide.

Aluwé, Kim [16] see Starkovich, Britt

Alva, Jose [200] see Bazán Pérez, Augusto

**Alvarado González, María Guadalupe (Universidad Veracruzana)****[145]**

*Rutas prehispánicas y coloniales en la región de Mazapa-La Sierra: Cambios, continuidades y su papel en la conectividad regional*  
 En Mesoamérica, los caminos y rutas fueron las vías de conexión para que actividades como el comercio, el intercambio, el tributo y la comunicación se desarrollaran entre asentamientos de manera interna y regional. El comercio siempre ha sido una de las actividades de movilidad más importantes de las distintas sociedades permitiendo el flujo de objetos, la interacción social con diferentes grupos culturales, el intercambio de ideas, etc. La movilidad de los grupos prehispánicos en el Sur de Veracruz, debido a sus condiciones geográficas y topográficas, es bastante interesante ya que estas sociedades tuvieron (y aún continúan teniendo) una red de comunicación tanto interna como de un área de Mesoamérica a otra, a través de rutas por vía terrestre y vía fluvial. La forma en la que sucedía esta comunicación dependía de la temporada en que se movilizaban, de la región y de las características mismas de las necesidades a cubrir (distancia tiempo, gasto, las materias a movilizar, etc.). Para la Cuenca Este del Papaloapan, se analizan las diferentes rutas que conectaran y comunicaran a las diferentes sociedades de algunos de los sitios del sur de Veracruz durante el Posclásico y la época colonial.

Alvarez, Alejandro [221] see Nava, Alberto

**Amador, Julio (UNAM) and Ofelia Márquez Huitzil (Independent Researcher)****[146]***Feline Symbolism in the Rock Art of Chalcatzingo, Mexico*

In this presentation we analyze in detail the iconography of the felines that are depicted on the rocks of the hillslopes of Cerro Chalcatzingo, located in the state of Morelos, Mexico. They date to the Middle Formative period (ca. 800 BCE). We consider that a new interpretation of the bas-reliefs is needed, due to the flaws we have found in previous descriptions and interpretations. A careful and accurate description is needed in order to attempt a more serious and truthful approach to their meaning. We can be sure that felines played a very important role within the mythical narratives of the Formative period, not only in the Olmec tradition but also at Chalcatzingo, that has a very evident influence of the Olmec heartland. Nevertheless, a local version was developed, characterized by specific style traits, homegrown images and narratives that are not found elsewhere. We present our arguments and conclusions based on up-to-date field observations and research.

**Ambrose, Stanley (U. Illinois, Urbana-Champaign)****[102]***Contested Traditions: Maasai Rock Art and New Testament Overpainting at a Meat-Feasting Site in Southwest Kenya*

Maasai warriors in Kenya and Tanzania use rockshelters and caves near reliable water sources as camps for traditional meat feasting. Known as *il-puli* (plural; *ol-pul*, singular), they are often painted with designs representing battle shields, using red, black, and white pigments, as well as curvilinear designs interpreted as cattle brands. Each warrior generation uses a different motif. Gramly's (1975) synthesis of these sites includes a report on one painted *ol-pul* on the eastern margin of the Maasai Mara Plains in southwest Kenya. A cave nearby, named Enkapune Naudo (cave with nine pools), contains numerous paintings with several shield designs. Six visits between 2005 and 2019 show continued use of this site for meat feasting. In 2016, numbered verses from the New Testament and a warning against slaughtering cattle written in the Maasai language (Maa) and Christian cross symbols were observed on the cave walls and entrance, some superimposed on Maasai paintings. Messages added after 2017 include "no admission non-Christian," "no camping," and "blood of Jesus" (English). Enkapune Naudo has become a site where Maasai traditional practices are being contested by Christian proselytizers. Visits by archaeologists, rock art researchers, and ethnographers may play a role in making Enkapune Naudo a contested arena.

**Ambrose, Stanley (U. Illinois, Urbana-Champaign)****[6]***Discussant***Amend, Tessa****[56]***Discussant*

Amend, Tessa [56] see Conti, Alberto

Amkreutz, Luc [149] see Dusseldorp, Gerrit

Anastasio, Alison [126] see McLeester, Madeleine

Anaya Hernández, Armando [11] see Kupprat, Felix

Anaya Hernández, Armando [48] see Reese-Taylor, Kathryn

**Andersen, Anabelle (College of Wooster)****[93]***A Proposed Reconstruction of the Underground Cityscape of Derinkuyu, Turkey*

The region of Cappadocia in Turkey possesses a unique claim to fame with numerous underground cities. Extending 85 m below the surface, one may find the deepest of these cities, Derinkuyu. With its 18 extensive stories and capacity for roughly 20,000 inhabitants, the city offers many different spaces designed for a range of functions. Yet, the nature of daily life underground and the specific functions of various spaces and structures in the site remain largely unexplored. This study uses artistic interpretations of the organization of the city landscape to visualize how the defensive role of the shelter during times of warfare, as well as its subtractive and subterranean architecture, shaped the domestic spaces and daily lives of its inhabitants throughout different eras of habitation—from the Proto-Hittite period to the Medieval or Early Modern periods—as the site underwent expansions and changes.

Andersen, Arthur [114] see Patton, Katherine

Anderson, David [72] see Edmonds, Mackenzie

Anderson, David [72] see Wells, Joshua

Anderson, Derek [97] see Miller, D. Shane

Anderson, Derek [117] see Strawn, James

**Anderson, Mark (University of Iowa Office of the State Archaeologist) and John Doershuk (University of Iowa Office of the State Archaeologist)****[97]***The Rummells-Maske Clovis Site, 13CD15: 48 Years from Discovery, Interpretation, Rediscovery, Reanalysis, and New Considerations*

The Rummells-Maske Clovis site was originally discovered in the early 1960s by a pair of avocational archaeologists. Follow-up field excavations were conducted by the University of Iowa Office of the State Archaeologist. Interpretations published in the early 1970s suggested the site represents a projectile point cache site. Roughly 30 years later the site's physical location was reestablished and the original notes and photographs were rediscovered. Several field investigations were undertaken over the next many years with additional artifacts recovered, new locational information attained, and use-wear analysis conducted. This reanalysis of the past and present datasets has yielded new considerations strongly indicating that this important Paleo-Indian site does not represent a cache.

**Anderson, Seamus (Texas State University)****[8]***The Monster in Me: The Institutional Context of the Bellaire A Pipes*

Recent archaeological scholarship on ritual practice and organization has increasingly focused on identifying the institutions that drive the production and circulation of ritual wares and sacra. In particular, the Bellaire pipes, known for their disquieting depictions of the Underwater Panther, were recently redefined by Steponaitis et. al. (2019) and attributed to some sort of institution or institutions that produced and circulated these pipes throughout the Lower Mississippi Valley and beyond. However, little is known about the scale, membership, or ultimate objectives of the institution(s) behind the pipes. This research seeks to understand the formation of this institution(s) by focusing on the iconography, geological sourcing, and archaeological context of the Bellaire A substyle, identified by Steponaitis et. al. (2019) as the earliest substyle within the Bellaire corpus. This presentation will display the preliminary results of research conducted as part of a master's thesis.

André, Lino [98] see Regala, Frederico

**Andrefsky, William (Washington State University)****[83]***Discussant***Andrews, Bradford (Pacific Lutheran University)****[220]***Imperial Impacts: Calixtlahuaca's Stone Tool Economy before and after Aztec Conquest*

This paper considers how the quality of life at Calixtlahuaca changed from the Middle to the Late Postclassic using technologically classified household obsidian inventories. Similar to many Highland Mesoamerican centers, in the Middle to the Early Late Postclassic, Calixtlahuaca appears to have been comfortably tapped into the commercial world system that tied much of the region together economically. This seems to have changed rather dramatically around the time the city was incorporated into the Aztec Empire. It appears that household obsidian inventories declined by half during this period, and the city's citizens probably suffered as a result. Not only did they have less obsidian, but the technologies they employed changed in some interesting ways. Reconstructing the "well-being" or quality of life in ancient communities aligns with the recent theoretical perspective in archaeology referred to as the "Archaeology of the Human Experience," which advocates evaluating how people experienced the past.

**Andrews, Bradford (Pacific Lutheran University)****[220]***Chair*

Anglin, Alanna [108] see Lewis, Brandon

Anschuetz, Kurt [66] see Duwe, Samuel

**Antoniou, Anna (American Philosophical Society), Earl Davis (Shoalwater Bay Indian Tribe) and Kristine Torset (Shoalwater Bay Indian Tribe)****[141]***"Good Bones": Zooarchaeological Data as Legal Evidence for the Shoalwater Bay Indian Tribe*

Despite holding federal recognition, Washington State does not recognize the Shoalwater Bay Indian Tribe's right to hunt, fish, or gather on their traditional territory. The Shoalwater community sees this as the primary impediment to their food sovereignty and nothing short of bureaucratic cultural genocide. However, an understanding of the historical significance of traditional food sources can assist the tribe in reclaiming these rights. In this paper, we present archaeological investigations at the Nukaunth Village site done with, for, and by the Shoalwater Bay Indian Tribe. Subsistence-related zooarchaeological data from Nukaunth span the precontact and contact periods, contextualizing the historical documentation that Indigenous sovereignty claims rely on in the US judiciary. We examine how and why these data may benefit future legal battles for culturally relevant food sources. We argue that using archaeological research to support Indigenous food sovereignty requires a holistic approach that blends Western and traditional knowledge systems and incorporates oral historical, historical, and ethnographic sources. With such an approach, archaeologists can better support the communities they work with and advance the discipline through interdisciplinary research programs that can inform present and future food practices.

**Antoniou, Anna (American Philosophical Society)****[141]***Chair*

Antoniou, Anna [131] see Sobel, Elizabeth

**Antorcha Pedemonte, Ricardo, Lane Fargher and Cuauhtémoc Moreno Cabrera****[62]***Maya Ecological Engineering: The Case of Homún, Yucatán*

In this paper, we will present preliminary results of the Parque Estatal Lagunas de Yalahau (Yucatán, Mexico) project. The objective of this project is to understand the impact of humans on the environment over the *longue durée*, as well as to document the sociocultural strategies utilized to management natural resources in the face of climate change. In this way, from a landscape and built environment perspective, we focus on observing the alterations, modifications, and changes made to the environment by Classic period Mayas. As we will show, they designed and built various agriculture engineering systems for the capture of water and exploitation of natural resources on a large scale, taking advantage of a deep understanding of the region's characteristics and environmental dynamics. Thus, we argue that technological advances, ecological conditions, and sociopolitical and economic organization of the site, together with diverse agroecological strategies modified ecological conditions in response to climate change, resulting in the archaeological site of Homún's settlement pattern and landscape.

Antti, Korpisaari [129] see Marsh, Erik

**Apodaca, Alec (University of California, Berkeley), Gabriel Sanchez (Michigan State Unvirseity) and Michael Grone (Amah Mutsun Land Trust)****[131]***Beyond Refuse: Eco-archaeology, Cultural Landscapes, and Indigenous Approaches to Shell Midden Archaeology in Central California*

Shell midden archaeology in central California has expanded significantly since the early twentieth century. Collaborative projects employing low-impact and fine-grained archaeological sampling strategies and integrating the participation and perspectives of Indigenous people offers a culturally and ecologically relevant framework for interpreting "shell middens." From a landscape-scale perspective, shell-dominated archaeological sites are just one component of the Indigenous cultural landscape that should be considered alongside other natural and cultural features. We highlight the value of Indigenous eco-archaeological approaches through two case studies conducted in collaboration with two Native Californian Tribes, the Amah Mutsun Tribal Band and the Esselen Tribe of Monterey County. Through these projects, we demonstrate the increasing evidence of Indigenous stewardship of terrestrial and aquatic environments and highlight how Tribes are still using "shell middens" to engage in ecological restoration and other cultural purposes.

Apodaca, Alec [121] see Grone, Michael

**Aracena, Kodiak (Universidad Mayor de San Andrés)****[124]***Convergencia natural y cultural: Samaipata desde una perspectiva de lo local*

Durante el periodo Incaico existieron diversos sectores de interacción (fronteras) que fueron fuertemente influenciados por la cultura Andina. Sin embargo, existen influencias claras desde tierras bajas que han permeado en sectores intermedios. Ambas arremetidas se han superpuesto de manera correlativa en el área de Samaipata que se caracteriza por ser una frontera natural entre las formaciones montañosas y un clima tropical, donde se ve la confluencia de diferentes culturas a lo largo del tiempo. Nuestras investigaciones en zonas fuera del área de influencia del Fuerte de Samaipata, nos han permitido notar cómo se interrelacionaron los grupos que habitaron esta área casi sin interferencia del Incario, dando paso a grupos Guaraní al este. Ambos grupos (Inca y Guaraní) se superponen de alguna manera, invisibilizando a las poblaciones locales. Es pues así, que este trabajo de manera exploratoria tratará de entrever la relación de los grupos locales y sus respectivas superposiciones (Inkario y grupos guaraní) en la zona a través de la revisión etnohistórica, excavaciones arqueológicas y análisis cerámico. Esto mostrando las diferentes dinámicas asumidas por estos grupos desde su forma de asentamiento, tecnología cerámica, y la comparación entre las mismas a un nivel local y eventualmente, a nivel regional.

**Arakawa, Fumi (New Mexico State University), Aimee Oliver-Bozeman (New Mexico State University), Allen Copp (New Mexico State University), Bethany Stevens (New Mexico State University) and Allyson Ueki (New Mexico State University)****[175]***A Case Study of Early Mogollon Great Kivas from Twin Pines Village in Southern New Mexico*

The 2021 New Mexico State University Field School took place at Twin Pines Village located in the Gila National Forest of southern New Mexico. This project aimed to determine whether a large depression at the site was indicative of a communal structure or had other functions. A secondary line of inquiry was to investigate the temporal occupation of the potential structure. To answer these questions, 17 students, four avocational archaeologists, and the PI excavated significant portions of the depression feature for three weeks. Findings from the excavation included details on the size of the structure, new artifact assemblages, and new potentially datable tree-ring samples. Data from this excavation is still being processed, but the early indication is that the features date to the Georgetown phase (AD 550–650) occupation. The Twin Pines structure was possibly constructed, used, and discarded contemporaneously with the South Diamond Creek Pueblo great kiva located approximately 5 miles away. Information from this newly uncovered structure, which is a great kiva, can provide crucial information about community practices of people living during the Early Pithouse phase in the Gila Forks region, as well as in other areas of the Mogollon cultural area.

Arakawa, Fumi [225] see Allison, James

Arakawa, Fumi [175] see Walker, William

**Arano Recio, Diana (INAH, Mexico), Keila Bredehoeft (East Tennessee State University), Dominique Rissolo (University of California, San Diego), Alberto Nava Blank (Bay Area Underwater Explorers) and Helena Barba Meinecke (INAH, Mexico)****[221]***Archaeological Conservation in the Submerged Caves of the Yucatán Peninsula: The Case of Prehistoric Human and Faunal Remains in Hoyo Negro, Mexico*

For decades, it has been evident to archaeologists and paleontologists that the caverns and caves of the Yucatán Peninsula promote aquatic conditions favorable for the preservation of faunal skeletal remains—some over 40,000 years old—and those of humans as well. In situ conservation of underwater cultural heritage in caves and cenotes has become a challenge in the face of increasing speleodiving activity, climate change, and population growth in the region. The conservation of the skeletal remains of a human female (known as “Naia”) has been a complex task in which various activities have been carried out, ranging from technical and legal protection, the creation of 3D models, and archaeometric studies, to preventive conservation actions for research, dissemination, enhancement, and safeguarding of the site. The activities carried out by the Hoyo Negro Project (of Subdirección de Arqueología Subacuática, INAH) demonstrate that the conservation of submerged cultural heritage is a multidisciplinary task in which social and natural sciences converge and that inter-institutional collaboration is needed, both nationally and internationally, in order to conserve not only the materiality of the bone remains but also the information derived from their study and thus the transmission of their legacy to future generations.

Araujo, Astolfo [187] see Correa, Leticia

**Araujo, Renata (Museum of Archaeology and Ethnology at the University of São Paulo), Mercedes Okumura (Laboratory for Human Evolutionary Studies) and Astolfo Araujo (University of São Paulo)****[187]***Geometric Morphometrics on the Spot! When Artifact Shape Tells Us More of Lithic Variability***[WITHDRAWN]**

Arce Torres, Susana [189] see Santana Quispe, Lady

**Ardren, Traci (University of Miami)****[188]***Classic Maya Queen Warriors and Queer Theory: An Archaeology of Intimacy and Compassion*

Perhaps one of Wendy's greatest contributions to archaeology was the redirection of settlement pattern studies to embrace individual households and the varied lives they contained. This began an archaeology of intimacy within Maya Studies, and my paper continues in this vein by using queer theory to reveal more of the diversity and agency of Classic period Maya queens. These women had far more agency than some previous scholarship has acknowledged, as they decoupled their womanhood or femaleness from normative assumptions of elite female behavior, to their own advantage and the advantage of their kin group. Queer theory provides a scholarly framework for exploring how gendered identities were constructed, contested, and manipulated through concepts such as gendered performance. This paper continues Wendy's commitment to finding the agency and humanity of people in the past by examining the social mechanisms certain royal women used to solidify their power within largely patriarchal systems of power. Gender was as much a weapon wielded by these women via elite media such as stelae and hieroglyphic texts, as any spear or knife. A queer-theoretical reading of the media they and their kin left behind takes inspiration from Wendy's compassionate archaeology scholarship.

Ardren, Traci [54] see Stanton, Travis

Arellano, Monica [196] see Byrd, Brian

Arellano, Monica [18] see Tushingham, Shannon

**Arieta Baizabal, Virginia (Instituto de Antropología, Universidad Veracruzana) and Ann Cyphers (Instituto de Investigaciones Antropológicas)****[201]***Arqueología del pasado reciente: El caso de las esculturas Olmecas de Antonio Plaza, Veracruz*

Este ponencia tiene como objetivo describir la relación teórica entre la arqueología y la historia, vista a través de las perspectivas de la historia del tiempo presente y la arqueología del pasado reciente. Ambos enfoques representan una irrupción en las formas tradicionales de abordar el estudio de procesos socioculturales, ya que se fundamentan en establecer una nueva relación con el tiempo y con los campos de acción del pensamiento. Las nociones de memoria e identidad cobran particular importancia cuando el reto en torno a la protección del patrimonio cultural está en el presente y futuro, donde la arqueología ha contribuido trascendentalmente en la construcción de representaciones sociales y en el fortalecimiento de la cohesión social. Utilizaremos nuestro estudio sobre el pasado reciente de siete esculturas olmecas petreas localizadas de manera fortuita en la localidad de Antonio Plaza y expondremos diferentes estrategias de divulgación de la historia reciente y la materialidad de la imagen como una vía factible para promover la valoración y protección del patrimonio arqueológico en la comunidad.

Aristizabal Losada, Lucero [193] see Wesp, Julie

**Arkush, Elizabeth (University of Pittsburgh), Weston McCool (University of Utah) and Ryan Smith (University of Pittsburgh)****[129]***Lighting the Andean "Dark Age": Key Issues of Chronology in the Late Intermediate Period in the South-Central Highlands*

Sandwiched between periods of fluorescent political development and interregional connectivity, the Late Intermediate period is often characterized in a broad-brush manner that does disservice to its dynamic history. Nevertheless, addressing the major developments that took place within the LIP is difficult without a solid handle on chronology. Here we review some of the critical issues and problems for the south-central highlands and upper coastal valleys, and highlight where better chronology could make significant advances. Key problems include the nature of settlement and society in the first century or two after the disintegration of the Middle Horizon states; the timing of large-scale climate episodes; and the chronology of settlement relocation or nucleation, shifts in the level of violence and warfare, and new colonization of some regions. Chronology is also central to understanding the end of the LIP, with early evidence for Inka presence in the southern Andes overlapping with the height of classically "LIP" societies in the altiplano. This paper constitutes a preliminary attempt at identifying what we know and don't know about chronology throughout the LIP.

Arkush, Elizabeth [9] see Kohut, Lauren

Arkush, Elizabeth [82] see Whittemore, Anna

Armit, Ian [157] see Scaffidi, Beth

Armstrong, Douglas [44] see Taylor Riccio, Kia

**Armstrong, Gabriella (University of Michigan)****[65]***Shell Tempering and Temper Variability at Lyon's Bluff: A Quantitative Petrographic Analysis*

This poster presents my honors thesis research which seeks to identify the goals of Mississippian potters, specifically as they related to tempering practices, at Lyon's Bluff through a quantitative petrographic analysis. Twenty thin sections made from sherds found at the site were systematically point counted to determine if shell and sand inclusions were intentionally added to clays to form

pots and are thus tempers, and whether there is definable variation in temper amounts. My results show that shell and sand were intentionally added and that their percentages co-varied intentionally. Six body groups were defined, based on the presence and percentages of shell and sand in each thin section, falling into three general categories: sand-and-shell tempered, sand tempered, and shell tempered. Shell tempering is a defining characteristic of Mississippian culture; however, there is little research that looks at differences in shell tempering and its relationship to sand tempering. This research encourages the classification of Mississippian pottery based on quantitative petrographic analysis, and my results show that shell tempering needs to be analyzed beyond just its presence or absence in Mississippian wares. Shell must be treated as a variable and intentional temper additive with cultural significance and potential functional advantages.

Arnauld, M. Charlotte [96] see Thornton, Erin

**Arnold, Bettina (U. of Wisconsin-Milwaukee)**

[178]

*Discussant*

**Arnold, Elizabeth (Hamilton College), Colin Quinn (Hamilton College), Horia Ciugudean (Muzeul Național al Unirii Alba Iulia) and Lacey Carpenter (Hamilton College)**

[71]

*Network Analysis in Transylvania: Identity and Motifs in Wietenberg Ceramics*

Material culture items convey information and play an important role helping people negotiate relationships within and between groups. Through processes of signaling and enregisterment, material items help create and embody the shared identities of distinct groups. In the Middle Bronze Age in Transylvania (2000–1500 BCE), ceramics were an important medium by which people marked and mediated social identities. During this period, regional cultural identities, such as the Wietenberg Culture, first crystallized in Transylvania. Social network analysis of Wietenberg ceramic motifs can be especially insightful in uncovering various identities and dynamics of social interaction at the time. In this poster, we use geospatial and network analyses to address several questions: (1) How were ceramics used to signal different identities? (2) What types of identities were communicated through ceramic motifs? and (3) How are these motifs spread across Bronze Age Transylvanian sites? Were the ceramics centrally produced and then distributed, or were local communities making their own ceramics and marking them with shared motifs? This research presents new insights into identity formation, signaling, and their economic and social consequences in Bronze Age Transylvania.

**Arp, Ryan (EPG, a Terracon Company) and Steve Swanson (EPG, a Terracon Company)**

[144]

*The Function of Oversized "S-3" Structures in Preclassic Hohokam Villages*

At the Snaketown archaeological site south of Phoenix, Arizona, Haury identified three oversized buildings at the southern edge of the village near a pottery production area. He classified these as "S-3" structures, and aside from a few ritual deposits, the structures were virtually empty with no evidence for a typical Hohokam domestic assemblage. Haury speculated these may have functioned similar to ethnographically documented O'odham council houses, where community members gathered to make important group decisions. The authors have recently directed excavation of four oversized structures consistent with Haury's "S-3" type at other locations across the Phoenix basin. These are similar to those at Snaketown in many ways beyond their size and common Sedentary period age. They are each positioned at village margins near craft production loci and also have no domestic assemblage. Features and assemblages in and around the structures suggest production of ritual items, ceramic and shell production, and possibly textile production. We discuss the origin of these special features, their function in terms of craft production within and between communities, and implications for the organization of production at Hohokam villages.

**Arp, Ryan (EPG, a Terracon Company)**

[144]

*Chair*

Arredondo Leiva, Ernesto [11] see Auld-Thomas, Luke

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

[153]

*The Maya Highland site of Kaminaljuyu, Guatemala: New Advances and Interpretations*

A long-term project supported by Alphawood Foundation at Kaminaljuyu has allowed for the larger understating of the site evolution. Kaminaljuyu is a neglected Maya Highland site that is in constant danger of disappearing due its location within the central valley of Guatemala where the modern city is located. Urban sprawl has impacted the region dramatically so the recent systematic research carried out during the last decade has enlarged our understanding of the site's history, allowing for the integration of previous research programs that began in the early 1900s and continue today as part of rescue operations. Because of its strategic location the site had long-distance interaction with sites in the Maya Lowlands, the eastern Highlands, and distant Central Mexico. This presentation will include new data and interpretations that link previous research with the recently funded Alphawood Foundation project.

**Arroyo-Cabrales, Joaquín and Patricia Martínez-Lira (University of York)****[23]***Faunal Remains from Monte Albán, Oaxaca, Mexico: Subsistence, Ritual, Symbolic, and Utilitarian Aspects*

The ancient Zapotec city of Monte Albán, occupied from approximately 500 BC to AD 850, was the prehispanic Oaxaca's largest and most important urban center. The zooarchaeological material dates from both Late Preclassic (500 BC–AD 200) and Early Classic (AD 200–500) periods, and was found in association with households and in public contexts near the city center. The faunal remains include bones of fish (snook, sea basses, buffalo fish, and bobo mullet); reptiles (mud turtle, pond slider, and green turtle); birds (yellow-winged cacique, common raven, great horned owl, ducks, red-tailed hawk, franklin's gull, harlequin quail, common turkey, and curassow); and mammals such as carnivores (dog, coyote, wolf, gray fox, northern raccoon, white-nosed coati, and cougar), artiodactyls (collared peccary, white-lipped peccary, white-tailed deer, and brocket deer), and lagomorphs (hare and rabbit). A great number of mammals were found in local habitats near Monte Albán or in cultivation areas, especially those allocated for subsistence activities. However, other species were brought from further away for ornamental, utilitarian, symbolic, and ritual purposes. The animal use is discussed, taking into account archaeological contexts, taphonomic evidence, iconographic representations, evidence at other sites in Mesoamerica, animal representations in codices, stelae, and fourteenth-century ethnohistoric sources.

Arzhantseva, Irina [23] see Tomazic, Iride

Attorre, Tiago [181] see Klassen, Sarah

**Auld-Thomas, Luke, Marcello Canuto (Tulane University) and Ernesto Arredondo Leiva (Universidad del Valle de Guatemala)****[11]***Breaking and Entering the Resilient Polity: El Achiotal's Evolution from the Inside and the Outside*

Archaeological interpretations of the "Preclassic collapse" and the emergence of Classic Maya civilization in its wake often conflate the stability (or resilience) of political institutions with that of the communities they administer, taking the "site" as the unit of analysis for each: El Mirador was abandoned, Tikal was resilient, and so on. But political and social stability are different things, and in the context of environmental change political stability is expected to come at the cost of at least some political subjects who must bear the costs of adaptation. Our research in the El Achiotal region of northwest Petén, Guatemala, has documented just such a divergence: El Achiotal's political institutions endured this chaotic period, but residential excavations in the surrounding region reveal a greater degree of disruption and transformation. Our research shows that a full accounting of the transformation of Maya society at the end of the Preclassic must first distinguish and then articulate political, demographic, and social processes.

**Austin, Anne (University of Missouri—St. Louis)****[111]***Dental Health and Dentistry in Ancient Egypt: Possible Evidence for Dental Filling and Extraction*

This study combines caries and antemortem tooth loss rates with possible dental interventions and medical texts to evaluate whether dentistry was practiced in Pharaonic Egypt. I analyzed 76 mandibles and maxillae consisting of 482 teeth and 1,054 alveoli for carious lesions and antemortem tooth loss; 11% of teeth were lost antemortem and 42% of maxillae and mandibles had one or more teeth lost antemortem. Carious lesions were present in 10% of observable teeth and 39% of mandibles and maxillae. Among these, I identified one possible example of a dental extraction and another of a dental filling. These are discussed side-by-side with medical treatments addressing dental surgery. AMTL and carious lesions were common in this sample, especially in older adults. The possible presence of a dental extraction and a dental filling in combination with textual references to dental fillings indicate dental interventions were sometimes used to manage dental health in Egypt. This study is the earliest evidence in Egypt for a dental filling in human remains. It also offers an interdisciplinary analysis of dental treatments that indicates, contrary to earlier publications, that dental interventions were practiced in Egypt during the New Kingdom.

**Austin, Anne (University of Missouri—St. Louis)****[111]***Chair***Avery, George****[80]***Archaeological Investigations at Three Freedom Colonies in East Texas*

In Texas, Freedom Colonies (FCs) are those settlements that were formed by African Americans after they were freed up until the 1920s. Dr. Andrea Roberts has identified over 500 FCs and she is the lead person of the FC Project at Texas A&M. On the Facebook page for this project, it is said that the term "Freedom Colonies" was coined by Thad Sitton and James Conrad in their 2005 book with the same name, but these places were already known to the people who lived there as Freedmen's Towns, Freedmen's Settlements, or Black Settlements. The Facebook page goes on to say that these places weren't just where the African Americans ended up or were pushed to; these were the places where property was acquired and a new settlement was created. I have already done minimal archaeology work at Shankleville, an FC in Newton Co., Texas, and was going to do a shovel testing survey at Union Grove (Jasper Co.) and Sand Hill (Nacogdoches Co.) as part of a grant from the Summerlee Foundation in Dallas, Texas, in October 2021. This grant had to be postponed until late June 2022 because of the COVID pandemic.

**Avery, L. Creighton (McMaster University), Megan Brickley (McMaster University) and Tracy Prowse (McMaster University)**  
**[17]**

*A Tale of Two Cities: Exploring Adolescent Experiences in the Roman Empire through Dietary Stable Isotopes of Incremental Dentine*

“Adulescentia” (adolescence) in the Roman Empire is characterized as a gendered period of the life course, with young men and women taking on new roles and responsibilities. While literary descriptions focus on experiences of the wealthy, bioarchaeological research is now starting to investigate experiences of adolescents in populations from other socioeconomic backgrounds, providing new insights into gendered experiences of aging in the past. This presentation integrates stable isotope analysis of incremental dentine sections ( $n = 344$ ), archaeological evidence, and literary sources to highlight the ways in which diets changed during childhood and adolescence at two Roman Imperial sites. At Isola Sacra (Italy, first–fourth century CE), stable carbon and nitrogen data indicate that gendered diets appear early in childhood, with males and females exhibiting different patterns and timings for dietary change. In contrast, at Lisieux-Michelet (France, fourth–sixth century CE), boys and girls consumed similar foodstuffs during “pueritia” (childhood), with diets diverging in “adulescentia” (stable nitrogen values between males and females: Mann-Whitney  $U = 21.0$ ,  $p = 0.012$ , Hedge’s  $g = 1.3$ ). Changing social roles as individuals reach “adulescentia” in Roman Italy and France are discussed, considering geographical and temporal differences between the two sites.

**Avery, L. Creighton (McMaster University)**

**[17]**

Chair

Avila Peltroche, Mary [190] see Dalton, Jordan

Awe, Jaime [218] see Ebert, Claire

Awe, Jaime [157] see Freiwald, Carolyn

Awe, Jaime [95] see Lee, Jordan

Awe, Jaime [91] see Marshall, Aubree

Awe, Jaime [96] see Roa, Ian

Awe, Jaime [216] see Stemp, W. James

Awe, Jaime [54] see Walden, John

**Ayala, Sergio (Gault School of Archaeological Research)**

**[116]**

*Technological Variability in Clovis: An Experimentalist’s Perspective*

The variability in Clovis lanceolate technology merits a reevaluation of accepted notions of a universal system, and requires new definitions to explain what Clovis technology represents. The variability may be partially explained within the dynamics of technological transmission, importation, and adoption across hunter-gatherer groups somewhat defined by their own distinct ecological contexts, lifeways, and already-existent tool implement knowledge and propensities. Based on an experimentally guided approach to the analysis of Clovis lanceolates throughout the southern Plains, Clovis lanceolates are reviewed and new defining criteria are discussed.

Ayers-Rigsby, Sara [127] see Kangas, Rachael

Ayres, William [154] see Levin, Maureen

**Baci, Erina (University of Michigan)**

**[147]**

*Exploring the Multiple Roles of Hillforts in Prehistory: A Case Study from Western Kosova*

In this paper, I present the preliminary results of my dissertation research in Western Kosova. For my dissertation, I explore how the prehistoric pastoral inhabitants of western Kosova and northern Albania utilized their landscape. I focus specifically on hillforts and assess their function(s) in the prehistoric landscape. Traditional interpretations of hillforts conclude that their role in prehistory was as defensible sites or refuges. While this was surely the case, I aim to complicate this understanding by exploring the multiple additional roles these strategically located sites may have filled in the past. This summer, I conducted surface collections at three hillforts in Western Kosova: Krye, Gradine, and Gjyteti. Magnetometry survey was also conducted at the last two. These three sites have in common one key characteristic; they are strategically located along the southern slopes of the Albanian Alps, overlooking the plains of Dukagjin. This means they have wide views of their surroundings, which encompass key flat settlements below. However, the magnetometry and surface collection results return three very different profiles, which I argue are influenced by their variations in their size, elevation, and underlying geology. Together, these physical constraints likely influenced the roles they may have played in prehistory.

**Baci, Erina (University of Michigan)**

**[147]**

Chair

**Bader, Anne, David Schatz (Corn Island Archaeology LLC) and Sara Deurell (Corn Island Archaeology LLC)****[77]***Say Their Names: The Archaeology of a Post-Civil War Black Community in the West End of Louisville, Kentucky—The Beecher Terrace Archaeological Project*

Since 2016, Corn Island Archaeology has managed the largest urban archaeological project to date in Kentucky. Focused on a Black community established during the first westward expansion of Louisville in the late 1860s, archaeology and archival research reveals the story of a self-sustaining community of educated black professionals and entrepreneurs, as well as those of the working class. The archaeology demonstrates that through time the quality of life decreased dramatically in this neighborhood, due in part to the national economic depression of the 1890s and a devastating natural disaster. However, the decline was likely hastened by the injustices of racial inequality.

Badilla-Cambronero, Adrián [167] see Corrales-Ulloa, Francisco

**Badillo, Alex (Indiana State University)****[123]***Ritual Bloodletting, Fertility, and Life: Ballcourt Representations in Quiechapa, Oaxaca, Mexico*

During an archaeological survey in the municipality of San Pedro Mártir Quiechapa, Oaxaca (Mexico) in 2016, archaeologists from the Proyecto Arqueológico de Quiechapa (PAQuie) encountered and documented a number of carved stone elements. Of particular interest are the 27 representations of ballcourts carved into natural rock outcrops at two sites in the region. This is the highest density in which this type of ballcourt representation occurs throughout Mesoamerica. After their initial discovery, members of PAQuie documented the carved stone ballcourts using structure-from-motion (SfM) photogrammetry, a quick and affordable technique to collect 3D spatial, quantitative, and visual data of stone carvings. In this presentation, I report on the carved stone ballcourt representations documented in the Quiechapa region and offer some preliminary interpretations. I first provide some description of the broader archaeological context in which the carvings were found. Then, I describe the methods used to record the stone carvings followed by a presentation of the data. Finally, I explore some possibilities as to why these carved stone ballcourt representations were created, how they may have been used, and what they may symbolize.

Baer, Kelly [77] see O'Mansky, Matt

**Bagwell, Elizabeth (Piñon Heritage Solutions) and Christina Conlee (Texas State University, San Marcos)****[41]***Compositional Analysis of Ceramics and Adobe: The Influence of Dr. Judith Habicht-Mauche*

Compositional analysis is an approach that Dr. Habicht-Mauche has spearheaded in her research. This poster presents two case studies utilizing compositional analysis that are a direct result of her mentorship. Chemical compositional analysis of ceramics from sites in Nasca, Peru, has helped elucidate major changes in social, political, and economic organization between AD 100 and 1450. During this long period ceramic manufacture changed from a dispersed community-based activity, to centralized production of fineware likely controlled by elites, and then back to community-based manufacture with extensive regional exchange. Macroscopic compositional analysis of adobe from sites in northwest Mexico has been used to identify the construction history and organization of production of adobe buildings in middle-range societies between AD 1200 and 1450. Buildings occupied by households are generally assumed to have been constructed by those same household members. Instead, the results of this study indicate that community architectural production may be as common as household architectural production.

Bailey, Chris [114] see Edwards, Briece

**Baires, Sarah and Melissa Baltus (University of Toledo, Ohio)****[15]***Neighborhood Foodways at the Spring Lake Tract, Cahokia*

Food plays a vital role in the human experience from providing the basic sustenance needed for survival to creating unique social practices that govern familial, political, and/or religious experiences while reconstituting identities. Foodways leave particular material traces, which include the pots and stone tools used to prepare and serve foods to the botanical and zoological remains left behind in the archaeological record, not to mention the depositional context of where those remains end up (e.g., midden, cached pot, structured burial). Deciphering this record, however, can prove difficult as the consumption and use of different types of plants and/or animals may fall along a spectrum from the domestic to the "ritual." Specifically, those remains and contexts that "blur the line" between domestic and ritual can be difficult to examine and interpret, making the need to reframe archaeological thinking reliant on analysis based in categories. In our case study described here, botanical and zoological remains from Cahokia's Spring Lake Tract neighborhood document practices in which the "ordinary" is intertwined with the "extraordinary" further elucidating the ways in which communal ritual practices that include commensality blur our dichotomous expectations.

Baires, Sarah [12] see Peres, Tanya

**Baisden, Rebecca, Dennis Carril (US Forest Service) and Dale Earl****[207]***Fire and Archaeology on the Jemez Ranger District of the Santa Fe National Forest*

Increased uncharacteristic high severity fire in historically frequent fire forests has prompted needed attention to understanding and mitigating negative impacts of fire on archaeological sites in the southwest. One example of how this work is implemented comes from the Southwest Jemez Collaborative Forest Landscape Restoration Project (SWJCFLRP) on the Jemez Ranger District of the Santa Fe National Forest, proposed in 2009 after Congress established the Collaborative Forest Landscape Restoration Project (CFLRP). The purpose and need of the project is to restore the structure, function, and resilience of frequent fire forests and reduce the potential for uncharacteristically severe wildfire while also providing for the sustainability of archaeological sites, traditional cultural properties, and sacred sites. There are over 3,000 cultural resources within the SWJCFLRP boundary. Approximately 90% of sites are considered fire-sensitive and include precontact fieldhouses, pueblos, rock art, rockshelters, and historic and precontact sites with wooden components. Given the nature of proposed restoration activities, in particular prescribed burning, there needed to be a way to mitigate the effects of fire on archaeological sites efficiently. This led to the Southwest Jemez Archaeological Site Thinning Project, resulting in fuels treatment on thousands of cultural resources on the Jemez Ranger District.

**Baisden, Rebecca****[207]***Chair*

Baisden, Rebecca [207] see Earl, Dale

**Baitzel, Sarah (Washington University in St. Louis), Bridget Bey (Washington University in St. Louis) and Allisen Dahlstedt (Arizona State University)****[17]***Being, Becoming, Belonging: Adolescence in the Ancient Andes*

The fast-growing body of bioarchaeological literature on children's health, diet, and trauma in the ancient Andes reveals the final years of youth to have been a liminal, transformative period in the life course. During this time, adolescents maintained access to communal foods and shed signs of earlier illness and disease. Having lost the ritual potency associated with childhood but not yet imbued with the rights and powers of adulthood, adolescent bodies were also exempt from many forms of ritualized violence. Informed by ethnographic and ethnohistorical accounts, we explore adolescence in the ancient Andes as a period of being, becoming, and belonging. From the gradual mastery of craft skills to the coming-of-age rituals of the Inca elite, Andean adolescence consists of processes and events that confer social and economic responsibilities as well as the elementary knowledge necessary for full participation in Andean society. In this paper, we use mortuary and bioarchaeological data from Tiwanaku burials (southern Peru, seventh–eleventh century CE) to propose an analytical framework that investigates adolescence not as a social category but rather as a process of being and becoming during which the experiences of childhood culminated in belonging to adult society.

Baitzel, Sarah [87] see Goldstein, Paul

Baitzel, Sarah [92] see Rivera I., Arturo

Baitzel, Sarah [85] see Rubinatto Serrano, Juliana

**Baka, Abby (University of Utah), Lisbeth Louderback (University of Utah, Natural History Museum of Utah) and Alexandra Greenwald (University of Utah, Natural History Museum of Utah)****[57]***Shifts in Technology at North Creek Shelter: Implications for Investment, Mobility, and Sexual Division of Labor*

The early Holocene record at North Creek Shelter (NCS) on the Colorado Plateau in southern Utah spans ~11,320–8,350 cal BP. We apply Surovell's (2009) lithic models of mobility and aspects of the prey choice and technological intensification models to NCS's faunal, botanical, and lithic assemblages to study technological changes as they relate to environmental changes and/or sexual division of labor. Technological change is measured in terms of degree of investment in different tool types relative to changing abundances of resources they are suited to handle. Degree of investment is quantified using an investment index involving tool formality and toolstone source distance. Changes in the relationship between chipped and ground stone investment as well as artiodactyl and high-return plant index values are compared to modeled changes in mobility frequency. NCS's artiodactyl and high-return plant indices suggest that artiodactyl hunting remained steady throughout the early Holocene while the diet expanded to include lower-return plant resources (Janetski et al. 2012; Louderback, in press). This pattern was interpreted to reflect different male and female foraging strategies. We predict that changes in chipped and ground stone technological investment also reflect differences in male and female foraging behaviors, including mobility and dietary resource prioritization.

Baker, Matthew [89] see Robinson, David

**Bakke, Gwen (Southern Methodist University)****[161]***The Aftermath of Contact and Colonialism: Wichita Subsistence Change in the Southern Plains*

This research is based on the faunal analysis and incorporation of new radiocarbon dates for three archaeological sites with rich yet unanalyzed faunal assemblages along the Red and Brazos Rivers spanning the Late Prehistoric to the historic period. The assemblages from these sites can help archaeologists determine potential changes, or continuity, in subsistence patterns in response to European interaction and occupation from the archaeological record. A particular focus is given to the hunting and use of bison commodities in southern Plains subsistence strategies that may have intensified during the historic period due to the high

trade demand for hides as part of European fur trade. Preliminary results are presented here from a faunal study of the Upper Tucker site on the southern Plains, a site occupied by the Wichita and their ancestors in northeast Texas along the Red River during the period in question. Results of this study contribute to the understanding of how traditional subsistence patterns responded to socioeconomic changes brought on by Europeans on the southern Plains.

Bakovic, Mile [147] see Tostevin, Gilbert

**Balanzario Granados, Sandra (Instituto Nacional de Antropología e Historia), Francisco Estrada-Belli (Universidad de Tulane) and Alexandre Tokovinine (Universidad de Alabama)**

[11]

*Dzibanché e Ichkabal y la dinastía Kaanu'1 en los periodos del Preclásico al Clásico*

Dzibanche e Ichkabal fueron las dos antiguas ciudades mayas de mayores dimensiones en el sur de Quintana Roo, durante las épocas del Preclásico, así como del Clásico. Recientes excavaciones en Ichkabal demuestran que sus edificios figuran entre los más monumentales de la época Preclásica. Adicionalmente recientes investigaciones por medio de lidar revelaron una red de centros ceremoniales secundarios a su alrededor y una vasta red de cultivos intensivos en los humedales. También gracias a los mapas lidar se pueden apreciar las dimensiones y complejidad del centro monumental de Dzibanche, de su asentamiento urbano y de la red de calzadas que interconectan los conjuntos monumentales del centro con los de la periferia. Una nueva lectura de sus monumentos apunta a la existencia de la dinastía Kaanu'1 en Dzibanché a principios del periodo Clásico. Todo lo anterior apunta a una compleja relación entre Dzibanche' e Ichkabal durante el Preclásico y Clásico con implicaciones importantes para la temática de los orígenes de la dinastía Kaanu'1.

Balanzario Granados, Sandra [199] see Hannold, Cynthia

**Balco, William (University of North Georgia) and Scott Kirk (University of New Mexico)**

[170]

*Mitigating COVID-19 Risk at University of North Georgia's Archaeological Field School: When Plans Meet Curve Balls*

The coronavirus pandemic upended plans for archaeological fieldwork and forced modifications to field and lab protocols in order to ensure the health and safety of participants, visitors, and landowners. This paper presents strategies employed during the 2021 University of North Georgia archaeological field school developed with the benefit of insight from colleagues in cultural resource management. Furthermore, we provide an example outlining our response to direct exposure from a crew member during the field school. This case study outlines the successes and unexpected curve-balls of conducting archaeological fieldwork while engaging students and avocational archaeologists. Recommendations for other projects are presented, contributing to strategies mitigating the risk of COVID-19 among archaeological field projects.

**Balco, William (University of North Georgia)**

[170]

Chair

Balicki, Jo [81] see Malin-Boyce, Susan

**Ball, Kaitlyn (National Park Service)**

[77]

*Archaeological Metal Detection of Devil's Kitchen, Gettysburg*

The Battle of Gettysburg (July 1–3, 1863) is known for being the largest and deadliest battle of the American Civil War, a turning point toward Union victory. The rock formation Devil's Kitchen is located beyond Devil's Den and Plum Run on the lower northwest slope of Big Round Top. Although the written history of Devil's Kitchen during the battle is sparse, both Union and Confederate troops likely marched upslope through the rocky formations to the battle for Little Round Top. Due to a recent trail renovation project, Devil's Kitchen was archaeologically investigated for the first time by the National Park Service. This paper presents the preliminary results of a recent archaeology survey carried out in Gettysburg National Military Park, at and around Devil's Kitchen. Using metal detection survey methods, we aim to demonstrate the significance of metal detection for battlefield archaeology, as well as utilize the recovered assemblage and located firing positions to illustrate the events that took place among the rock formations of Devil's Kitchen on the afternoon of July 2, 1863.

Ballester, Benjamin [155] see Sepúlveda, Marcela

**Baltus, Melissa (University of Toledo) and Paula Bryant (Illinois State Archaeological Survey)**

[164]

*Joe Louis: A Late Fisher Phase Village on the Little Calumet River*

With some notable exceptions, there are few late precontact sites that have been formally excavated in the Chicagoland area. This is especially true for Fisher phase (ca. 1200–1400 CE) occupations, a period of upheaval and transformation elsewhere in the Midwest at Middle Mississippian sites like Cahokia, Angel, and Kincaid. The Joe Louis site (11CK284), ideally located on the Little Calumet River in southeast Cook County, is one such exception. Partially excavated in advance of a bridge emplacement, this single-component late Fisher phase habitation offers insight into the lifeways and regional interactions of people during this

important era. Excavations at the site revealed a year-round occupation by maize agriculturalists, who were also utilizing the abundant natural resources offered by the ecotonal location of the site. Lithic raw materials, ceramic styles, and exchange objects hint at extraregional ties to groups in northwestern and southern Indiana, though the closest relationships seem to have been with people living at the possibly contemporaneous Hoxie Farm site to the east. These traits, along with botanical and artifactual evidence for ceremonial practices, suggest that Joe Louis may have been a place of gathering in northern Illinois where people navigated and negotiated changing identities and relationships.

Baltus, Melissa [15] see Baires, Sarah

**Bamforth, Douglas**

[52]

*Discussant*

**Banks, Ben**

[137]

*Discussant*

**Banks, Jennifer (Wichita State University) and Crystal Dozier (Wichita State University)**

[39]

*Ceramic Microfossil Residues from the Merchant Site (LA3414)*

Microfossil and residue analysis is an important tool for providing context of the environment and culture within the archaeological record. Versar Inc. contracted the Archaeology of Food Laboratory at Wichita State University to conduct microfossil and residue analysis on 10 Ochoa sherds collected from the Merchant Site (LA43414). The Merchant site is a fourteenth- and early fifteenth-century pueblo site located in southeastern New Mexico. Recovery of microfossils from the 10 sherds was low, but several taxa were identified. From these taxa, both pollen and starch microfossils of *Zea mays* were identified from multiple sherds. Absorbed organic residues analysis was compared with known compounds using gas chromatography mass spectroscopy at the Texas A&M Mass Spectrometry Facility but no biomarkers were identified in the samples. These findings are congruent with macrobotanical and phytolith results from the Merchant Site and advance our understanding of plant use in the American Southwest between AD 1350 and 1450.

**Banks, Kimball**

[7]

*Moderator*

**Banner, Joy**

[1]

*Discussant*

Banton, Caree [80] see Stevens, Craig

Barba Meinecke, Helena [221] see Arano Recio, Diana

Barba Meinecke, Helena [221] see Nava, Alberto

Barba-Pingarrón, Luis [125] see Nuñez-Cortés, Yajaira

**Barber, Sarah (University of Central Florida) and Arthur Joyce (University of Colorado Boulder)**

[13]

*Assembling the Río Viejo Acropolis: Territorializing Governance in Terminal-Formative Coastal Oaxaca*

During the late Terminal Formative period (100–250 CE), the lower Río Verde valley of Pacific coastal Oaxaca was the location of a short-lived regional-scale polity. Regional governance was managed from the site of Río Viejo, a 225 ha settlement on the west bank of the Verde River. While the site consists of dozens of earthen platforms dating to various periods of the prehispanic era, the largest of these was Mound 1, the Río Viejo acropolis. The acropolis was built rapidly around 100 CE and composed of a single massive basal platform supporting numerous structures and substructures. During the Terminal Formative period, the acropolis was the location of human activities ranging from offering to cooking and eating to construction and maintenance to discard. The acropolis also formed part of the infrastructure through which regional governance was defined, maintained, and ultimately, dissolved. In this paper, we consider the dense assemblage of people, places, things, and other-than-humans that cohered at the acropolis to territorialize regional governance in the Terminal Formative period.

Barber, Sarah [24] see Duncan, Neil

Barber, Sarah [156] see Joyce, Arthur

**Barberena, Ramiro (CONICET, Universidad Nacional de Cuyo), Augusto Tessone (CONICET-INGEIS), Erik Marsh (CONICET, Universidad Nacional de Cuyo), Lumila Menéndez (Department of Anthropology of the Americas) and Nicolás Rascovan (Microbial Paleogenomics Unit, Institut Pasteur)**

[157]

*Southern Andean Migrations: Multiscalar Approach to Its Drivers and Consequences*

Migrations are an intrinsic aspect of human societies in the present as in the past and occur across levels of sociopolitical complexity, from small-scale mobile societies to ancient states. While the incidence and socio-demographic role of migrations is systematically studied in states and complex polities of the Americas, we still know little about its dynamics in small-scale hunter-gatherer and agropastoral communities from 'peripheral' areas of the southern Andes (Argentina and Chile, 30–34°S). We build on previous results that record a rapid migration pulse of farmers between 1270–1420 AD in the Uspallata Valley (Mendoza, Argentina), shortly preceding the local Inka conquest. Here we present a new project that will develop a bottom-up approach to human life-histories linking the micro-scale of the individual with the levels of communities and larger groupings. This will be based on an interdisciplinary study of human remains combining the demographic analysis of sites with migrants and locals, scale of mobility and place of origin by means of strontium isotopes, cultural practices of cranial modification, and biological lineages as revealed by morphometric studies and nuclear paleogenomics. By developing multiple case studies from diverse geographical and social contexts, we can contribute to building a comparative approach to human migrations.

**Barbieri, Alvise (ICArEHB, FCHS, Universidade do Algarve), João Cascalheira (ICArEHB, FCHS, Universidade do Algarve), Vera Aldeias (ICArEHB, FCHS, Universidade do Algarve) and Nuno Bicho (ICArEHB, FCHS, Universidade do Algarve)**

[98]

*Upper Paleolithic Foragers on a Slope: Geoarchaeological Data from Vale Boi (Southern Portugal)*

Vale Boi (Vila do Bispo, Algarve) is the only site from Southern Portugal to show a sequence stretching from the early Gravettian (32 Kcal BP) to the early Neolithic (6.8 Kcal BP). It is placed along a slope and was investigated with multiple test pits. Excavations reached uneven depths (0.5–4.0 m) due to the irregular geometry of large limestone boulders, which were interpreted as fractured bedrock. These finds might indicate that materials preserved only in sediment traps, or that Paleolithic foragers sought shelter in these natural depressions. To test these hypotheses, we conducted geophysical and micromorphological analyses. Our geophysical data show that the limestone boulders, originally interpreted as bedrock, correspond to a rockfall, which infills an erosional surface carved in clay deposits. Gravettian and Proto-Solutrean (30–25 Kcal BP) deposits unearthed at the foothill of Vale Boi, area named "Terrace," show the clearest anthropogenic sedimentary features, with paleo-surfaces delimited by stacked bones crushed by trampling, convincingly supporting the hypothesis that foragers used this depression. Although we cannot exclude that these hunter-gatherers exploited also other areas of the hillside, we demonstrated that Gravettian and Proto-Solutrean foragers were able to take advantage of natural landforms to endure on periodically instable slopes.

**Bardolph, Dana**

[58]

*Discussant*

Barela, Genna [20] see Beller, Jason

Barela, Genna [20] see Hodapp, Magen

**Barket, Theresa (California State University, Bakersfield) and Andrew Garrison (Brian F. Smith and Associates)**

[117]

*Can We Tell What Broke This Point? Functionality and Humboldt-Type Points in Late Prehistoric California*

Un-notched concave-base point types like Humboldt are long-lived types estimated to have persisted in some form or another from about 4000 BC until AD 1500. Such points are posited to have been used as knives, dart points, or even dispatching spears. In the literature, the persistence of concave-base points in late prehistory is often associated with their use as knives, but based on an analysis of Humboldt/Sierra Concave-Base points recovered from some late prehistoric sites in California, many such points display abundant evidence of impact damage. This observation prompted us to conduct an experiment testing macro-damage created in use as a knife, dispatching spear, and atlatl-propelled spear. Our preliminary findings suggest that although they may have been used as knives, use as a knife does not account for the impact damage observed in these assemblages. Initial experiments on damage created in use as atlatl-propelled spears and dispatching spears produces abundant evidence of impact damage, but we believe with additional experimentation, the frequency of certain diagnostic breaks could help to refine our understanding of their function and demonstrate the persistence of technologies that have been overlooked by the archaeological community in periods after the appearance of the bow and arrow.

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

[175]

*Reexamining Mogollon Pithouse Chronology: A Bayesian Approach*

The Mogollon Pithouse period (AD 200–1000) is associated with many cultural changes, such as the introduction of plain, red-slipped, and painted ceramics; the development and elaboration of communal structures (kivas); changes in pithouse form; and shifts in landform use. Yet there are many questions and debates regarding these changes, which are often related to the timing and duration of these events. This study combines legacy dates and new AMS dates from Mogollon pithouse sites in a Bayesian chronological framework to reexamine the chronology of these cultural changes. Specifically, new preliminary date estimates are given for the introduction of plain and red-slipped ceramics, circular and rectangular pithouses, communal structures (kivas), and

shifts in landform use. Given that the preliminary date estimates raise some questions regarding the traditional chronology, directions for future chronology building in the Mogollon region are discussed.

**Barlow, Robert (University of Wyoming), D. Shane Miller (Mississippi State University), Ryan Parish (University of Memphis) and Alexander Craib (University of Wyoming)**

[117]

*Behavioral Adaptations to the Younger Dryas in Northern Alabama*

Kuhn and Miller (2015) argue that variability in life histories of projectile points from Tennessee result from (a) increasing costs of artifact replacement due to limited raw material access, or (b) a decline in average hunting returns. In northern Alabama, where lithic raw materials are plentiful and accessible, we make predictions for artifact life histories of Clovis to Big Sandy projectile points based on changes in biotic structures over the course of the Younger Dryas (12,900–11,700 BP). Then, by analyzing data from the Alabama Paleo Point Survey, private collections, and reflectance spectroscopy methods, we found variation in artifact life histories that correlate with changes in average hunting returns, prey size, and forest structures. We conclude that no abrupt changes in artifact life histories were coeval with the beginning of the Younger Dryas. However, our study indicates that foragers in northern Alabama made significant changes in projectile point technology following changes in biotic resource structures at the end of the Younger Dryas and during the subsequent Holocene warming.

Barlow, Robert [97] see Miller, D. Shane

**Barnes, Benjamin (Shawnee Tribe)**

[180]

*Discussant*

Barnes, Benjamin [30] see Renson, Virginia

**Barnes, William (University of St. Thomas, Saint Paul)**

[55]

*Aztec Royal Portraiture and the Highland Central Mexican Visual Tradition*

It is still something of a wonder that after well over a century of archaeological exploration at the great highland Mexico site of Teotihuacan, we still do not have a clear idea of who actually ruled this preindustrial city during its millennial rise and decline. At the later Postclassic Mesoamerican center of Tula, despite extensive Aztec accounts of its royal dynasty and mytho-history, we are still at a loss to identify clear images of rulers or, really, anyone treated in an overtly individualistic fashion. Both of these centers employed the highland central Mexican visual tradition, a tradition codified, if not created, at Teotihuacan in the early part of the last millennium. Here it is illustrated how this ancient tradition can be more fully understood by looking at the moment when later imperial Aztec workshops, likely in reaction to the bombastic royal traditions being encountered in eastern Mesoamerica, began to abandon some of its core principles.

**Barraclough-Tan, Beatriz**

[175]

*Braided Together: Combining Different Sandal Technologies in Salado Material Culture*

Salado material culture is marked by technological and artistic attributes that show influences from Kayenta people who emigrated out of the northern Southwest in the late thirteenth century and from the local peoples they settled with in the Mogollon and Hohokam areas. Basketmaker sandals from the Four Corners region are delicately woven with intricate raised, twined aspects that serve both as decorative elements and functional tread. Mogollon sandals, in contrast, are overwhelmingly coarsely braided. While there are distinct examples of individual styles of sandals, this study aims to examine how sandal making traditions might have combined to create a hybrid style indicative of the combination of cultural influences inherent to the Salado tradition.

**Barrett, Thomas (PaleoSystems)**

[179]

*Ghosting: Archaeological Shadows in Public Sight*

Ghosting is a popular term for disappearing from another person, but like the architectural and archaeological principles of the same concept, traces are always left in material and memory. Historic preservation efforts have traditionally pushed back against erasure of historic and archaeological sites, usually with museums, landmarks, and adaptive reuse. But these efforts can only expect to preserve a small portion of the historic record, most especially, as directly experienced by the average member of the public (any public). Yet within all communities and all landscapes, are vestiges of the past—from remnant stone walls dividing small farms, to wells and privies capped by a century of subsequent use, to intact archaeological sites within contexts formerly assumed to have been irrevocably “disturbed” for research purposes—these resources often exist within a constrained knowledge base; either restricted SHPO data, with redacted locations, or retained by “outsiders” (e.g., avocational and/or “looters”). This paper explores both the numerous contexts of these cultural “ghosts” and discusses potential avenues for their integration and preservation in the widest possible public sphere.

Barrett-Wilt, Greg [162] see Binkley, Megan

**Barrientos, Tomas (Universidad del Valle de Guatemala) and Marcello Canuto (Tulane University)****[153]**

*La Corona Regional Archaeological Project: Fifteen Years of Research and Conservation in Northwestern Petén, Guatemala*  
Thanks in large part to the Alphawood Foundation, the La Corona Regional Archaeological Project has conducted research and conservation activities in one of the least known archaeological regions of the Maya Lowlands. Although initial interest in the study region derived from the long search of the mysterious "lost Maya city" named Site Q, the long-term scientific goals of the project have highlighted the importance of the ancient kingdom of Sak Nikte' (La Corona) as one of the most important in ancient Maya history, especially because of its unique relationship with the hegemonic state led by the Kaanul dynasty (also known as the Snake Kingdom). We summarize the results and interpretations derived from a multiyear, multidisciplinary research program combining aerial and ground survey, test and intensive excavation, epigraphic decipherment, laboratory analysis, and conservation activity. We also discuss the current situation of the archaeological sites in the northwestern Petén region. We discuss how this area, despite recurring threats of forest fire, drug trafficking, and deforestation, remains strategically critical for the overall long-term preservation of the Maya Biosphere Reserve. Instead of discounting this problematic area as irrecoverable, we should focus future investment in research and conservation in its long-term preservation and management.

**Barrionuevo Alba, Monika (Universidad Peruana de Ciencias Aplicadas)****[194]***Del mar a la eternidad: Los artefactos de concha del sitio Kilómetro 4, Ilo, Perú*

En este artículo presentamos un corpus de artefactos de concha del sitio arqueológico Kilómetro 4 de los Periodos Arcaico Medio y Tardío, ubicado en la provincia de Ilo, departamento de Moquegua, al sur del Perú. Este sitio se encuentra en una quebrada seca a la altura del kilómetro 4 del ferrocarril industrial de la empresa Southern Perú, al norte del Puerto de Ilo, y se conforma de varias zonas que responden a funciones y ocupaciones distintas. El estudio de los artefactos de concha permite que arqueólogos e historiadores del arte puedan definir no sólo sus características morfológicas y estéticas, así como las técnicas que se utilizaron para crearlos delimitando tipos y estilos, sino que también puedan llegar a un acercamiento de lo que fue su manera de pensar: diferencias de estatus social, de género, relación con los ancestros o los dioses. En el mundo andino la importancia de la concha (el exoesqueleto que presentan algunos moluscos) fue trascendental, no solamente como herramientas y ornamentos de uso diario, sino también como elementos que llevarían los muertos a la eternidad; más aún, la concha fue alimento de los dioses en algunas culturas prehispánicas.

Barrionuevo Alba, Monika [194] see Costion, Kirk

**Barrios, Edy (CUDEP-USAC)****[53]***K'inich Mo' Witz' and the Presence of Two Particular Plaza Plans at Tres Islas in the Passion River in Petén Southwest, Guatemala*

Tres Islas or K'inich Mo' Witz, is a site in the Passion River in the southwest of Petén, Guatemala. It is famous for its three Early Classic stelae with characters wearing Teotihuacan and Maya clothes, which date to 475 CE, and located in a region where few monuments were dedicated during this period, and even occupation is rare. In 2003, the Cancuen Project uncovered an astronomical observatory formed with the three stelae and one altar and realized that it was an E-Group type, named by Marshall Becker as Plaza Plan 10. Excavations also focused on a small group of mounds, which uncovered a long and permanent occupation from the Late Preclassic (300 BCE) through to the Terminal Classic (850/1000 CE) in a residential Plaza Plan 2 form, including some evidence of temporary occupation during the Early Postclassic, showing a particularly long occupation probably based in a complex political and commercial network.

**Barrios, Edy (CUDEP-USAC)****[53]***Chair*

Barrios, Edy [177] see Griffith, Cameron

Barrios, Edy [53] see McNeil, Cameron

Barroso, Rosa [155] see Bueno-Ramírez, Primitiva

Barton, Loukas [139] see Morgan, Christopher

**Barvick, Kathleen (University of Arizona), Kelsey Hanson (University of Arizona), Rebecca Harkness (University of Arizona) and Barbara Mills (University of Arizona)****[152]***The Distribution and Use of Plazas in the Chaco World*

Plazas are widely recognized as important zones of interaction within ancient and modern societies. In the ancient US Southwest, there has been much study of enclosed plazas in the Pueblo IV period, but less investigation of the forms and variety of enclosed and semi-enclosed plazas in the Chaco world. In this paper we use the Chaco Social Networks and CyberSW databases to examine the relationship between residential population size and plaza size and accessibility across the northern US Southwest in the AD 800s–1200s. By comparing the size and accessibility of plazas to the room numbers and extrapolated population at Chacoan great house sites, we determined the capability of different sites to host public events in the plazas that could incorporate different populations. Was there a constant scaling relationship between residential population and plaza area through time, and if not, what are the temporal, spatial, and social contexts of settlements that deviate from expectations? Different parts of the Chaco world show

different patterns in the relationship between plaza size and population, allowing us to draw conclusions about the connections between certain regions and the operations of Chaco outliers in this social realm.

**Bar-Yosef Mayer, Daniella (Tel Aviv University)**

[183]

*The Earliest Strung Beads of the Middle Paleolithic*

*Glycymeris* shell beads found in Middle Paleolithic sites are understood to be artifacts collected by modern humans for symbolic use. In Misliya Cave, Israel, dated to 240–160 ka BP, *Glycymeris* shells were found that were neither perforated nor manipulated; nevertheless, transportation to the cave is regarded as symbolic. In about 120 ka BP at Qafzeh Cave, Israel, modern humans collected naturally perforated *Glycymeris* shells also for symbolic use. Use-wear analyses backed by experiments demonstrate that the Qafzeh shells were suspended on string, thus suggesting that the collection of perforated shells was intentional. The older Misliya shells join a similar finding from South Africa, while the later-dated perforated shells from Qafzeh resemble other assemblages from North Africa and the Levant, also dated to about 120 ka BP. We conclude that between 160 ka BP and 120 ka BP there was a shift from collecting complete valves to perforated ones, which reflects both the desire and the technological ability to suspend shell beads on string to be displayed on the human body.

Barzilai, Rebecca [113] see Thompson, Christine

Bass, Angelyn [215] see Guebard, Matthew

**Bates, Warren (State of Louisiana Office of the Attorney General)**

[1]

*Discussant*

**Batsuren, Byambadorj (National University of Mongolia), Bayarsaikhan Jamsranjav (Max Planck Institute) and Julia Clark (Utah State University, Logan)**

[99]

*Disease among the Mongols: Paleopathological Analysis of the Khorig Mountain Site in Northern Mongolia*

We introduce the results of the paleopathological study of human remains from the medieval period (1200–1500 CE) of Mongolia. The archaeological specimens reported here are from the Mongol Empire period found at the Khorig mountain site in Khuvsgul province, currently the largest cemetery identified with elite people of the Mongol Empire. The human remains consisted of 19 females, 24 males, and 19 of undetermined sex. Prevalence of osteoarthritis, trauma, and oral diseases were examined. No tooth caries were observed, while dental abscess and antemortem tooth loss are recorded in 20% and 55%, respectively, among the 20 individuals observable for dental diseases. Only one case (5%) of enamel hypoplasia has been observed, which was a female individual. Despite a small size, various pathological cases are recorded in this sample. Trauma was observed in 10.2%, limb joint osteoarthritis; in 28.6%, spinal diseases (Schoberl's Node, vertebral fusion, and osteophytes); and in 32.6% of 49 human remains. In addition, a single case of diffuse idiopathic skeletal hyperostosis, two cases of ankylosing spondylitis, and three possible cases of gout were recorded. The results of this research will be compared with previously published data on human disease and trauma to better characterize these findings.

**Bauer, Andrew (Stanford University)**

[126]

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

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

Baumann, Laura [207] see Poister, Nicholas

Baumann, Steve [202] see McCrackan, Jennifer

Baumann, Steve [207] see Poister, Nicholas

**Baustian, Kathryn (Skidmore College)**

[173]

*Reassessing Mimbres Mortuary Practices after a Century of Excavations*

Since the early 1900s, formal excavations have been completed at Mimbres sites in southwest New Mexico. As one of the key traits used to “define” or characterize this and other ancient Indigenous culture groups, burial practices were often sought out and

documented by archaeologists. A schematic by Jesse Walter Fewkes in 1914 depicted body positions within graves as seated and upright. Excavations in the century since have documented this as a rarer practice. Further work in the Mimbres region established a common practice of inhumation of the dead in flexed positions. Artifacts observed most often included ceramic bowls either near or on the hips, feet, or head. Though thousands of Mimbres burials have been excavated, the variation in mortuary patterns has been glossed over in the literature. The research presented here demonstrates how common some mortuary practices were at different points in the chronological span of these communities. More details regarding deviations from the flexed inhumation practice and ceramics as primary grave goods are provided and explored to assess aspects of identity, ritual, and social interaction in Mimbres culture.

**Baxter, Carey (USACE ERDC-CERL) and Susan Enscoe (USACE ERDC-CERL, Retired)**

[56]

*Evaluating Historic Farmstead on Military Training Lands: A Streamlined Methodology for NRHP Eligibility Determination*

The Department of Defense is tasked with managing the cultural resources on its lands. For installations that contain large numbers of historic farmsteads on training lands, meeting these requirements through traditional archaeological approaches entails large investments of personnel, time and organization capital. Cultural Resource Management personnel at the Engineer Research and Development Center, Construction Engineering Research Laboratory (ERDC-CERL) developed a methodology for efficiently identifying the best examples of historic farmstead sites and also those sites that are least likely to be deemed eligible for listing on the National Register of Historic Places. This methodology has been successfully utilized at Fort Leonard Wood, MO, since 2005 and tested at Fort Bragg, SC, in 2014. In 2018–2020 the methodology was expanded to include historic ranches and tested nationwide on 29 sites at five military installations. The results of the fieldwork show this approach is applicable nationwide with a few restrictions, and it can be used to quickly identify sufficient information about historic farmstead sites to expedite determinations of eligibility to the National Register.

**Baxter, Erin (Denver Museum of Nature & Science)**

[152]

*Seen and Unseen: An Historical Reinterpretation of the Great Kiva and Refuse Mounds at Aztec West*

Part 1: The reconstructed Great Kiva at Aztec West is storied, sacrosanct, historically fraught, defended, and debated as the architectural centerpiece of both the ancient past and modern park. This paper will examine its accuracy through historic archives and photos. Part 2: Unlike the kiva, the refuse mounds that once surrounded Aztec west are largely gone. Their early excavators provided a brief interpretation and maps as to their function, but these too are largely fraught and were later informed by Chacoan work by Judd. The archives hint at a more complex role. This paper will delve into these two outstanding questions and provide speculative new interpretations of these two significant seen and unseen places at Aztec Ruins.

**Baxter, Erin (Denver Museum of Nature & Science)**

[37]

*Discussant*

[152]

*Chair*

Bayham, Frank [121] see Martinez, Antoinette

**Bazán Pérez, Augusto (Fundacion Augusto N. Wiese) and Jose Alva (Fundación Augusto N. Wiese)**

[200]

*Dating the Mochica Occupation at Huaca Cao Viejo*

Recientes investigaciones en el Complejo Arqueológico El Brujo se han enfocado en refinar el entendimiento sobre la secuencia constructiva de la Huaca Cao Viejo, que junto a la Huaca Cortada dominan el paisaje visual de este extenso asentamiento prehispánico de la costa norte del Perú. Excavaciones en área han permitido delimitar de mejor manera fases previamente definidas, y encontrar otras, más antiguas de lo esperado. Un robusto conjunto de fechados radiocarbónicos, provenientes de contextos seguros, ubican temporalmente de manera precisa la ocupación Mochica en el complejo a partir del edificio más intervenido del sitio.

Beach, Timothy [104] see Clark, Morgan

Beach, Timothy [48] see Luzzadder-Beach, Sheryl

Beahm, Emily [136] see Colaninno, Carol

Beahm, Emily [159] see Rayburn, Kathryn

**Beardall, Antonio (Texas State University)**

[210]

*Lost in Translation: The Impact of Jargon on Dissemination*

Archaeological research in Belize has evolved from an antiquarian pursuit to scientific research not only focusing on the ancient Maya but those who came before, and those who came after. A recent development in Belizean archaeology is the focus on public archaeology and heritage management via institutions like the Belize Institute of Archaeology. While there have been great

successes in public archaeology outreach and the education of young Belizeans in archaeological field methods, the dissemination of recent archaeological data is still largely academic. Foreign archaeologists working in Belize are charged with the social obligation of sharing their work with the Belizean people. However, such dissemination, occurring predominantly at the Belize Archaeology Symposium, is frequently plagued by technical jargon, leaving other archaeologists in the audience satisfied, but the Belizean public perplexed. My paper addresses such issues from the perspective of a Belizean public archaeologist and offers recommendations for future scholars who will work in Belize and hope to disseminate information effectively.

Beardall, Antonio [172] see Watkins, Tia

Bearheart, Robert [196] see Corbett, Debra

**Beaudoin, Matthew (Timmins Martelle Heritage Consultants Inc.)**

[223]

*Archaeological Taxonomy as Violence in Ontario CRM*

Over the last decade, Indigenous and descendant communities are increasingly becoming active participants in Ontario CRM archaeology. This participation predominantly focused on the active fieldwork and having representatives on site; however, there has recently been an increasingly amount of review and critique of the resulting technical CRM reports. This shift has resulted in increasing discussions related to the negative impacts of the conventional archaeology taxonomy on descendant communities. In many instances, communities have highlighted the ability of these taxonomies to disenfranchise descendant communities from participating in the consumption and valuation of their heritage and inadvertently reinforce stereotypes. Overall, there is an emphasis that, at best, the conventional taxonomies do not serve descendant communities' interests, and at worst, these taxonomies cause active harm. This paper discusses some reoccurring conversations, the varied requests that have been made, and how archaeologists are (or are not) responding to the critiques they receive.

**Beaulieu, Sarah**

[1]

*Discussant*

**Beaumont, Lesley (University of Sydney)**

[17]

*New Approaches to Studying Adolescence in the Past: Exploring Archaeological Evidence through the Lens of Developmental Biology and Psychology*

"Adolescence" is a term familiar to contemporary Western society that is imbued with culturally and temporally specific connotations and associations. Nonetheless, the concept of a liminal phase of development between childhood proper and adulthood can be traced back to antiquity, at least in the case of members of social elites. This paper therefore inquires how we might seek to explore the meaning and experience of this dynamic transitional life stage in bygone societies, with a particular focus on the ancient Mediterranean world. Emphasis is placed on examining the evidence provided by archaeology through the lens offered by our understanding of developmental biology and psychology, thereby contributing an innovative theoretical approach to the study of youth in a historical context.

**Bebber, Michelle (Kent State University) and Alastair Key (University of Cambridge)**

[76]

*Optimal Linear Estimation (OLE) Modeling Supports Early Holocene (9068 cal BP) Copper Tool Production in North America*

The discovery and development of metal as tool media is a topic of global interest. A fundamental research goal involves establishing the timing of human experimentation with naturally occurring copper ore, which is commonly associated with sedentary, agrarian-based societies. Conversely, in North America, there is well-documented millennia-scale exploitation of copper as tool media by small, seasonally mobile, hunter-gatherer groups in the western Great Lakes. This phenomenon is generally associated with Middle-Late Archaic populations; however, archaeologists have suggested that Late Paleoindian groups began using copper as a tool media soon after entering the Lake Superior Basin. Here, we use Optimal Linear Estimation modeling to infer the origin date for copper tool production in North America. Our results show that the invention of copper as a tool media likely occurred shortly after the first pioneering populations encountered copper ore during the Pleistocene-Holocene transition. The origin date modeled here (9068 cal BP) reveals several important features about the behavior of pioneering, hunter-gatherer populations. Moreover, our results suggest that this phenomenon represents the earliest known use of metal for utilitarian copper tool production.

**Bebber, Michelle (Kent State University)**

[76]

*Chair*

Bebber, Michelle [187] see Eren, Metin

Bebber, Michelle [20] see Mika, Anna

Bebber, Michelle [187] see Mukusha, Lawrence

Bebber, Michelle [4] see Wilcox, Daniel

**Beck, Jess (Harvard University)****[148]***Positionality and Publishing: Archaeological Alignments to the Sciences and the Humanities*

Academic archaeologists consider high tier science-subject journals key venues for publishing important research and strengthening CVs. Research has shown, however, that the work published in such forums tends to be topically restricted; in the past several decades dominant foci have included archaeometry, origins research, and investigations of domestication and paleoenvironment. This paper explores the paradox of the high disciplinary prestige accorded to science-subject journals despite the low likelihood that most archaeologists will be able to publish their work through these platforms. First, I identify a sample of top tier science-subject journals with reference to a recent study of the prestige hierarchies of archaeological publishing. Expanding on previous research, I examine how the archaeological research topics published in these venues have shifted or remained stable over time. Second, I situate the growing professional emphasis on science-subject journals within the broader historical context of the discipline, drawing on the rich history of tensions between the “two cultures” within anthropology and archaeology. I link these tensions to both the alignments embraced by popular theoretical paradigms within archaeology and the recent cultural and professional ascendancy of STEM disciplines within the academy.

**Beck, Jess (Harvard University)****[148]***Chair*

Beck, Jess [71] see Leahey, Aidan

Beck, Jess [71] see Waterman, Anna

**Becker, Marshall (West Chester University)****[53]***Discussant***Becker, Rory (EOU)****[137]***Discussant***Becker, Sara (University of California, Riverside)****[194]***Moquegua Valley Labor: Before, during, and after Tiwanaku Colonization (AD 600–1000)*

In the Central Andes of South America, modern Indigenous people practice reciprocal labor with groupings organized around family hamlets and kin networks, and teamwork is used plant, harvest, and till fields. However, it is not clear how long these shared labor practices have been used in the Andes. To look at workload changes over time, this paper evaluates labor from prior to the Tiwanaku polity's influence in the Moquegua Valley of Peru, through to Tiwanaku colonization and collapse. Comparisons among a small sample of Late Formative (250 BC–AD 500) people to colonists (post-AD 600) during, and then to people post-Tiwanaku influence (after AD 950) in the region show higher workload levels prior to Tiwanaku people moving into the region. These greater workload levels are also found in Late Formative groups living at high-altitude near Lake Titicaca. Further, even after the collapse of Tiwanaku influence in the Moquegua region, labor rates are similar. Hence, Tiwanaku colonists adjusted the local ecosystem to support an agricultural-pastoral trading system in the Moquegua region, introducing larger-scale reciprocal labor networks that may have changed the way labor was viewed and utilized in this region of the Andes.

Beckham, Christopher [51] see Eerkens, Jelmer

Beddows, Patricia [221] see Chatters, James

Beddows, Patricia [154] see Rissolo, Dominique

**Beekman, Christopher (University of Colorado, Denver) and Michael Mathiowetz (Independent Scholar)****[14]***An Epiclassic Crucible: Assessing Ideological Connections between Teuchitlán and Aztatlán with Implications for the SW/NW*

We highlight the pivotal role of the Epiclassic period (500–850 CE) to understand the relationship between Late Formative/Classic maize ritual associated with the Teuchitlán culture, and the emergence of Flower World concepts among the Pacific coast Aztatlán polities after 850 CE. The intervening centuries are associated with the collapse of the Teuchitlán culture, widespread drought, and the displacement of inland trade routes to the Pacific coast. We examine key elements present in earlier and later periods—maize ritual, the ballgame, the use of cargo bowls, and the symbolic associations of public architecture—to evaluate the continuities or discontinuities across the Epiclassic. We work with three main possibilities: Is there continuity or logical development from earlier ideas into the Postclassic? Does the Epiclassic document the intrusion of Flower World antecedents from some third location, probably central Mexico? Or does the Epiclassic represent new ideas initiated within western Mexico that interrupted or suppressed concepts that would reemerge on the Pacific coast after 850 CE? We present our strongest evidence, to understand the emergence of concepts of Flower World in western Mexico and by extension, the heightened connectivity between Aztatlán and SW/NW cultures that developed after 850 CE.

**Begel, Johann (Archam, CNRS UMR 8096) and Julien Hiquet (Archam, CNRS UMR 8096)****[53]***Skull Offerings: The Koxol Offertory Assemblage in the Maya Area*

Skull offerings among the ancient populations of Mesoamerica are well documented by archaeological, ethnohistorical, and iconographical sources. New finds in 2017 in the Lowlands Maya site of Naachtun (Guatemala) required intersite comparisons beyond the few well-known contexts such as Uaxactun E-Group's or Marshall Becker's study for Tikal's Plaza Plan 4 groups. The association of a cached human skull and a pair of ceramics was defined by William Coe as Tikal's Koxol "offertory assemblage." The human remains in these peculiar deposits are obviously linked either to sacrificial, burial, or post-interment practices, but even at this scale of analysis, no attempt was ever made to undertake a systematic study. As a consequence, this paper represents the first step in the difficult task of understanding the sense and meaning of these very peculiar Maya caches, often described in the literature, but actually very poorly understood. A careful selection of truly isolated skull offerings revealed a broadly shared ritual tradition among most of the Maya area. On the basis of a corpus of 76 deposits from 30 Maya sites—until now—this paper aims at classifying the variations of this skull offertory assemblage and to follow its distribution in the Maya area through time.

Bejko, Lorenc [147] see Schultz, Julian

**Belardi, Juan (Universidad Nacional de la Patagonia Austral), Cristian Kaufmann (INCUAPA-CONICET-UNICEN), Agustina Massigoge (INCUAPA-CONICET-UNICEN), Luis Borrero (CONICET-UBA) and María Gutiérrez (INCUAPA-CONICET-UNICEN)****[85]***Taphonomic Study of Modern Guanacos Killed by Winter Stress in Southern Patagonia (Argentina): Implications for the Study of the Archaeological Record*

During the harsh winter of 2020 a great number of guanacos (*Lama guanicoe*) died in the interior steppe of South Patagonia. Most of the carcasses were concentrated at places that offered some protection, mostly isolated calafate shrubs (*Berberis*). The following summer we surveyed a sector of the Middle Basin of the Gallegos River (Argentina) and documented a total of 275 carcasses from an 8 km transect ( $n = 265$ ) and one separate cluster ( $n = 10$ ). All of them were examined in the field, recording GPS position, sex, age, carnivore marks, weathering stages, disarticulation, and dispersal of bones, among other variables. Accordingly, conditions for survival and burial of bones were surveyed. We selected two clusters of carcasses for taphonomic longitudinal studies. The aim of our study is focused in understanding the conditions under which such an abundance of carcasses can become part of the fossil record, what are the best markers to infer events of massive death, and discuss their eventual role for human hunter-gatherers. In order to achieve these, in this presentation we will discuss the guanaco mortality profile, in the light of the current and historical weather records, and the pattern of bone preservation.

Belardi, Juan [92] see Taylor, William

Beliaev, Dmitri [62] see Safronov, Alexander

**Belisle, Veronique (Millsaps College)****[89]***Hallucinogens and Fermented Beverages in Middle Horizon Cusco, Peru: Community-Building and Tensions in a Context of State Intrusion*

In the Andean Middle Horizon (600–1000 CE), the consumption of hallucinogens (snuff) and fermented beverages (chicha) is well documented. In the Cusco region of southern Peru, the use of these mind-altering substances at the local center of Ak'awillay points to two processes: community-building in a context of Wari state intrusion and tensions related to growing social inequality. Excavation data suggest that hallucinogens were accessible to many and focused on healing, community, and communication with the supernatural. In contrast, chicha was prepared by elite households and served at feasts that displayed increasing status differences. Although both types of ceremonies involved altered states of consciousness, they were conducted in different contexts and served distinct interests. This was accompanied by further tensions between local practices and those of Wari state colonists. Among the Wari, hallucinogens were highly controlled by the elites, who likely added snuff to chicha served at large feasts. Local practices involving snuff persisted at Ak'awillay despite Wari presence, suggesting that some mind-altering substances provided an avenue for local communities to maintain power over the supernatural. At the same time, participation in Wari diacritical feasts might have allowed local leaders to find new ways to legitimize their growing authority.

**Belisle, Veronique (Millsaps College)****[189]***Discussant***[189]***Chair***Belknap, Lori (Cahokia Mounds State Historic Site)****[15]***Redefining Visitor Experience Using Augmented Reality Technology*

A new augmented reality (AR) project at Cahokia Mounds greatly enhances the visitor experience by immersing them in the dynamic cultural aspects of an ancient bustling city. At Cahokia Mounds, visitors routinely express difficulties envisioning what was on the landscape 1,000 years ago when only the vestiges of the ancient site remain today. With a grant from the National Endowment for the Humanities, the Cahokia Mounds Museum Society launched a project that would redefine visitor experience,

steeping them in rich cultural elements, and taking them back in time. The 13 waypoints (six at Monks Mound, and seven at the Grand Plaza) on the site are key locations where 3D models, pop-up knowledge points, state-of-the-art object recognition technology, and walking audio tours merge to bring the past to present with unparalleled realism.

Bell, Charreau [206] see Johnson, Phyllis

Bell, Charreau [206] see Rieth, Amy

**Bell, Ellen (California State University Stanislaus)**

**[156]**

*Biographies of Place in the Copan Valley, Western Honduras: A Palimpsest Approach to Understanding Early Classic Maya Statecraft*

As one of her many contributions to the anthropological study of the past and its impacts on the present, Wendy Ashmore pioneered a holistic approach that continues to inform our work as her students. This paper explores Early Classic period (AD 250–600) placemaking in the earliest levels of the Copan Acropolis, with special reference to a Late Classic period (AD 600–900) burial that Wendy and her team excavated in the Copan North Group and interments within the much smaller Acropolis at the Classic period Maya center of Quirigua, Guatemala. Taken together, these constructions illuminate different practices (and outcomes) related to the creation of elite space and its role in Maya statecraft. In the best tradition of Wendy's scholarship, the paper concludes with a consideration of the continuing impact of these created spaces within the local communities that have grown up around them.

**Bell, Ellen (California State University Stanislaus)**

**[53]**

*Discussant*

Bellamy, Hunter [66] see Bledsoe, Jacob

**Beller, Jason (NAU), Magen Hodapp (NAU), Genna Barela (NAU), Mitchell Cleveland (NAU) and Chrissina Burke (NAU)**

**[20]**

*What's on the Menu? Experimental Archaeology and Comparative Analysis of Burned Faunal Elements from the Houck Sites, Northeastern Arizona*

The effects of cooking fauna, as observed through burning marks on animal bones, can lead to a better understanding of environmental conditions and past human behavior. This research identifies how long a faunal element can be exposed to heat, and at what temperatures, before producing the varying stages identified as burning. Using the faunal assemblages of the Houck sites, members of the Faunal Analysis Laboratory at Northern Arizona University (NAUDAFAL) collected data including identification of each element, taxonomic identification, and taphonomic effects present. In addition to collecting archaeological data, our research evaluated several experiments in cooking fauna to explore specific temperatures and effects, such as color, texture, and fragmentation changes, resulting from the process. Two experiments were conducted using 10 deer long bones with their hides removed. In the first, five of the long bones were placed in an earthen oven, a design that is used in the Southwest, to simulate cooking food. The second experiment employed the remaining five long bones into an open flame fire to simulate wildfire-like conditions. Following our experimental analysis, the archaeological and experimental data are compared to better explain how the taphonomic effects present at the Houck sites were created.

**Beller, Jeremy (Simon Fraser University) and Mark Collard (Simon Fraser University)**

**[149]**

*Hominin Mobility and Resource Procurement around a Levantine Oasis During the Middle Pleistocene: A Multi-site Analysis*

Archaeological investigations of hunter-gatherer mobility, particularly in the very distant past, usually involve the examination of lithic material from a single site. This is unfortunate because it leaves connections among contemporaneous sites unexplored. Here we report the preliminary results of a study designed to develop a multi-site perspective on mobility in the Azraq Basin of eastern Jordan during the later stages of the Middle Pleistocene. A barren and dry region, the Azraq Basin contains a series of scattered Lower Paleolithic sites that correspond to increasingly inhospitable environmental circumstances of MIS 8–6. We carried out provenance analyses of previously excavated stone tools from several of these sites and analyzed a number of potential raw material sources. Our results indicate that the movement of materials within the basin occurred at varying ranges, with both nodules and finished tools having been transported to dedicated reduction and caching locales on the landscape. These results indicate that during the Middle Pleistocene hunter-gatherer groups in the Azraq Basin exploited a variety of sources, revisited task-specific sites, and exhibited a high degree of mobility.

**Beller, Jeremy (Simon Fraser University)**

**[149]**

*Chair*

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

**[196]**

*Application of the Unified Federal Review Process: Case Studies from Indian Country*

This paper outlines the role of the Unified Federal Review (UFR) process in Indian Country. In 2013 the (Superstorm) Sandy Recovery Improvement Act amended the Stafford Act by adding Section 429—which enhanced approaches taken for FEMA's

environmental and historic preservation project reviews—improving decision-making and allowing more predictable outcomes from planning and implementing disaster recovery projects. Importantly, it also mandated increased engagement and collaboration with tribal nations. The Unified Federal Review establishes consistent and best practices for environmental and historic preservation project reviews whenever multiple federal agencies are engaged in disaster recovery efforts. The UFR staff builds relationships with other federal/state/territorial/tribal regulatory agencies, departments, etc., to unify and expedite project reviews.

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

[196]

*Chair*

Bello, Jose [189] see Cusicanqui, Solsiré

**Bellorado, Benjamin (Crow Canyon Archaeological Center)**

[152]

*The Footwear of Leadership and Prestige in the Chaco World: Twined Sandals and House Societies in the Greater San Juan River Drainage*

For decades archaeologists have tried to understand the social relationships that linked great houses both within Chaco Canyon and across the greater San Juan River drainage. Scholars of the Chaco regional system have looked at similarities and differences in architecture, pottery technologies and designs, community organization, cosmological alignments, and more to explore the scales of interconnection and discontinuities between outliers and the Chaco core. These studies have argued for various models of corporate, network, hierarchical, and egalitarian leadership strategies over time and space. Recently, several Chaco scholars have applied aspects of house society models developed by Lévi-Strauss to explain leadership and organizational strategies in Chaco Canyon and among the outliers. Recent analyses of the production, distribution, use, and discard of twined sandals and other footwear from Chaco (AD 850–1150) and post-Chaco era (AD 1150–1300) great houses and community centers provide new evidence supporting the presence of, and interconnections between, house society-based leadership strategies and interaction networks. This presentation explores these data and implications for the significance of twined sandals in tracking continuity and change of leadership strategies at several great houses in the Chaco Core and at outlier communities across the Chaco World.

Belmar, Carolina [18] see Ramírez Funes, Horacio

**Belmiro, Joana (ICArEHB), João Cascalheira (ICArEHB, Universidade do Algarve), Xavier Terradas (CSIC-IMF) and Nuno Bicho (ICArEHB, Universidade do Algarve)**

[98]

*Raw Material Provisioning and Use throughout the Upper Paleolithic at Vale Boi (Southwestern Iberia)*

Hunter-gatherers relied strongly on lithic raw materials, which make them key aspects to understanding mobility and land-use, raw material provisioning, and exchange. Currently, only a few studies exist on raw material exploitation during the Upper Paleolithic (UP) in Southwestern Iberia and much about the technology, economy and mobility of those populations is still unknown. With one of the most complete UP sequences in the region, well dated archaeological horizons, and large lithic assemblages, the site of Vale Boi is ideal to understanding how hunter-gatherer groups throughout the different UP phases explored lithic resources and moved across the landscape. This paper presents the first results of a PhD project targeting the characterization of siliceous rock exploitation at Vale Boi throughout the UP levels. Archaeological samples were compared with geological samples recovered in southwestern Portugal through survey, using a combination of macroscopic classification and microscopic observation of thin sections. This allowed us to preliminarily characterize several aspects of the cultural, technological, and economical organization of human groups through time.

Belmiro, Joana [98] see Cascalheira, João

Beltrán, Boris [11] see Rossi, Franco

**Bemmann, Jan (University of Bonn)**

[99]

*Constructing Space: An Imperial Launched Settlement System in the Core Area of the Mongol Empire*

Permanent settlements of the Mongol Empire era on the Mongolian Plateau seem to be rare and only few sites have been explored so far in some detail. Well-known are Karakorum, the capital of the Mongol Yeke Ulus, Avraga near the Kherlen River, and Khirkhira in Transbaikalia. To date, there is no differentiation of settlements by form and function; they are all called cities, which prevents the recognition of the amazing diversity in the settlement system until now. On the basis of about 50 settlements with permanent architecture it is possible to create a classification and to relate form and function to each other. Several clusters stand out in the distribution, at least one of which reveals the carefully planning hand of a ruler. The city itself is embedded in a network of palaces, artisan and agricultural settlements, and production sites. Quite obviously, the political elites of the empire used the advantages of cities and representative palaces for their own purposes.

**Bender, Herman (Hanwakan Center for Prehistoric Astronomy, Cosmology and Cultural Landscape Inc.)****[79]***Deep Time and Ice Age Memories Expressed in the Placement of Select Manitou Stone and Sacred Boulders*

During the 1999 International Rock Art Congress (IRAC) held in Wisconsin, Mr. Ralph Redfox, a traditional Cheyenne elder and healer, recounted an ancient Cheyenne oral tradition that upright stones were placed on the north end of the hill as “guardians against the ice returning [from the north].” The Cheyenne believe that as a hill slopes up toward the north, it gets colder. The story has been interpreted as suggesting a late Pleistocene or early Archaic period origin (10,000–8000 BC) for it and placement of the upright stones. There is additional evidence which may support the idea of an early to mid-Archaic origin. During an inventory of the sacred rocks and boulders in southern Alberta, Canada, two-thirds of them were discovered to occupy a prominence with a northward focus. Furthermore, the date or age of utilization firmly placed all in the early to mid Archaic. According to ancient tradition, the Cheyenne primary direction of focus is north. It is considered by both the Algonquin and Siouan-speaking Woodland and Plains tribes, both of whom migrated west to the Great Plains from the upper Great Lakes area, to be the most ancient and primary direction.

**Bendremer, Jeffrey****[134]***Discussant*

Bendtsen, Aka [33] see McGovern, Thomas

Bendtsen, Aka [114] see Nielsen, Michael

**Benfer, Bob (University of Missouri-Columbia), Bernardino Ojeda R. (Retired, Museum of the University of La Molina) and Andrés Ocas Q. (Independent Investigator)****[103]***Astronomical Alignments from Structures Surrounding Giant Animal Effigy Mounds at El Paraíso, Peru*

In previous work, we have reported astronomical alignments associated with the principal temple of the archaeological site of El Paraíso in coastal Peru. Here, we describe a new investigation of small platform mounds associated with two giant animal effigy mounds. A total station map of the site permits possible astronomical alignments to be measured directly. Alignments were corrected for obliquity and also corrected for the apparent curvature of the sun and moon over the elevation of nearby ridges. Azimuths for predicted astronomical events were obtained from Starry Night Pro Plus 6.4.3. Results were that 12 out of 13 platform mound alignments were within  $\pm 1^\circ$  of predicted astronomical alignments. To account for these findings and those of the giant animal platform effigy mounds at the site, we propose a cosmology in the Late Prececeramic with supernatural animals and solar and lunar alignments linked to dark cloud constellations. We believe the building of these mounds was directed by astronomer priests. A shared belief in a cosmology that included a punishing force, an Apu, an animated mountain, may have eased transactions by engendering trust among individuals living across river valleys and at different altitudes.

**Benjamin, Jeff (Columbia University)****[50]***The Plate and the Print: Figure and Field in the Anthropocene*

A common form of imaginative reverie—often expressed in literature (or experienced in life)—is the act of gazing into a deep blue sky, daydreaming and assigning different shapes to the passing clouds. Within certain contexts, even the clouds themselves are anthropogenic, prompting one child of a worker at a coal powered electricity plant to observe “My daddy makes the clouds” (Cancel 2020). If we reverse the direction of this imaginative gaze, and look at the earth from the clouds and the sky, we see a textured, patterned surface, with forms that inspire similar musings. From an observer on the ground, waste landscapes can have a monumental scale, but the proliferation of accessible lidar imagery presents the earth’s surface as reminiscent of a relief sculpture or an etching plate, embossed and debossed by human activity. As the human species continues to sculpt the earth’s surface, lidar imagery arrives as a form of printmaking, revealing interlocking forms of nature and culture that have been prepared—as a printmaker’s plate—over the millenia, revealing the full extent and depth of human intervention, causing one to conjecture that human beings are a species of printmakers.

**Benjamin, Jeff (Columbia University)****[50]***Chair***Bennett, Matthew, David Bustos (National Park Service), Thomas Urban (Cornell University) and Sally Reynolds (Bournemouth University)****[184]***The “Ichnological Revolution”: The Contribution of White Sands National Park*

Over the last decade there has been a dramatic rise in the discovery of fossil human track sites around the world. This is fueled by greater awareness on the part of excavators who might have excavated through such subtle traces in the past while questing for a bone or stone tool. The routine availability of digital photogrammetry has also played a role, and the increasing availability of sophisticated statistical tools allow hypothesis-testing and more rigorous inferences to be made from footprints. White Sands National Park has played an important role in this ichnological revolution revealed in recent years as probably the largest concentration of Pleistocene tracks in the Americas. The coexistence of human and extinct megafaunal tracks have provided unparalleled behavioral insight into human hunting behavior in relation to these extinct animals. It has been the test bed for method

development both in terms of geophysical investigation and statistical analysis of tracks. This paper reviews the new dates for the site, as well as the contribution of the White Sands track site to questions of human migration and megafaunal extinctions and scopes the future research agenda at this important locality in the American southwest and beyond.

Bennett, Matthew [184] see Bustos, David  
 Bennett, Matthew [184] see Odess, Daniel  
 Bennett, Matthew [184] see Urban, Thomas

**Bense, Judith**

[77]

*Mexican Figurines in Eighteenth-Century Spanish West Florida*

Many ( $n = 150$ ) rare, small ceramic figurines and fragments have been recovered in good context from last two of the four locations of the early eighteenth-century West Florida presidio (1698–1763). A brass “crown” probably for a religious figurine and two ceramic “platforms” for displaying figurines on home altars were also recovered. About half are associated with a church and the remainder are from domestic contexts. Most of the identifiable forms of the figurines are of humans, but many domestic animals are also represented. The presence of the figurines coincides with an increase in the number of married soldiers and women recruited and sent to the presidio on the frontier of the Spanish Empire. The figurines will be compared to those recovered in the seventeenth-century missions of northeast Florida and shipwrecks. Figurines continue to be popular in both sacred and secular contexts to the present day.

**Benson, Erin (Illinois State Archaeological Survey) and Elizabeth Watts Malouchos (Illinois State Archaeological Survey)**

[15]

*Remaking Mississippian: A View of Moorehead Phase Community-Making from Cahokia's Peripheries*

Recent research on the Late Mississippian period (1200–1400 CE) in the American Bottom has largely centered on questions of Cahokia's decline as a consequence of climate change. This has left the broader Greater Cahokia region relatively neglected and the complexities of the Late Mississippian period overlooked. However, excavations over the past 60 years in the Greater Cahokia region have revealed dynamic Moorehead phase (1200–1300 CE) landscapes, including places with evidence of mound activity, specialized buildings and objects, feasting, and caching as Cahokian power became increasingly decentralized. In this paper, we integrate data from new and legacy collections and approach Moorehead phase community-making from varying scales. Investigations of the small upland site Rhea, the larger floodplain farming community at the Sauget Industrial Park, and the well-known but poorly understood Mitchell Mound Center reaffirm the diversity and highlight the vibrancy of Late Mississippian communities outside of Cahokia.

**Benson, Kristin (Vanderbilt University) and Tom Dillehay (Vanderbilt University)**

[151]

*Ritual before Domestic: Preceramic Contexts of Exotic Plants in Northwest Peru*

[WITHDRAWN]

Beramendi-Orosco, Laura [163] see McClung de Tapia, Emily

Beresford-Jones, David [189] see Santana Quispe, Lady

**Bergmann, Christine (University of South Florida)**

[74]

*Exploring the Environmental Context of the Lower Chincha Valley, Peru, Using Pollen Analysis and pXRF*

The Chincha Valley, located 200 km south of Lima, is one of the largest valleys on the south coast of Peru. Paracas, believed to be the oldest complex society on the southern coast of Peru, occupied the Chincha Valley during the Early Horizon period (900–200 BCE). Although Paracas is well represented in the archaeological record, relatively little is known about the populations that settled in the region, as well as the environment in which they lived, prior to Paracas. Recent excavations at Pozuelo, the earliest known site in the Chincha Valley, suggest the region was inhabited prior to the Paracas occupation. Additionally, pollen and phytolith analyses performed on soil from Pozuelo indicate the environmental context during initial settlement of the region was vastly different from what is seen today. Radiocarbon dating and elemental analysis on soil excavated from Pozuelo are performed to test the hypotheses that inhabitants prior to the Early Horizon period had the ability to occupy the region in the absence of irrigation agriculture as well as use landscape modification strategies, such as the draining of marshlands, to permit the cultivation of agricultural resources.

**Berikashvili, David (International Archaeological Center of the University of Georgia)**

[183]

*Landscape Archaeology of Samshvilde Former Settlement and the Adjacent Area (Georgia, South Caucasus)*

Samshvilde, a historical city of Kvemo Kartli region in the southern part of Georgia, is a complex and multi-period archaeological site. The city occupies a strategic location on a basalt cape above ravines formed by the Khrami and Chivchava rivers. Samshvilde and its surroundings may have been inhabited since the Stone Age, but the urban complex dates mainly to the medieval period, when it became the region's principle political-economic center. Despite the site's importance, until recently there has been little

concerted archaeological study of Samshvilde. In 2012 the Samshvilde Archaeological Expedition was initiated by the University of Georgia, which has taken a multidisciplinary approach to the site, using various interdisciplinary methods. Alongside these methods, landscape survey was also conducted in 2017–2020 in the adjacent areas of the site, the cave complexes, megaliths, hydrological network, the ruins of medieval bridges were found as a result. Our presentation at SAA's 87th annual meeting will bring new archaeological data from Samshvilde and from South Georgia in General. It will help to share our knowledge and understanding of prehistorical and historical past of South Caucasus among colleagues and wide archaeological society.

**Berman, Mary Jane (Miami University) and John Whittaker (Grinnell College)**

[187]

*Theorizing Bipolar Stone Tool Manufacture in Lucayan (Bahamian) Microlith Assemblages*

Microliths are found ubiquitously at sites spanning the Preceramic and Ceramic Age occupations of the Caribbean, lowland South America, and Middle America. The range of microlith "types" is not understood fully. Moreover, only a few studies have investigated the manufacturing process by which these microliths were produced. In the Bahama archipelago, microliths made from locally available limestone and from chert, an imported nonlocal raw material that the Lucayans obtained by way of direct procurement or trade and exchange with the Greater Antilles, were used to process wild and domesticated plants. Chert microlith drills were also used to create shell and stone beads. Through the study of attributes present on a collection of chert microliths and cores from five Lucayan sites located on San Salvador island, the Bahamas, and replication studies, we theorize the *chaîne opératoire* for making the chert microliths. Based on ethnographic data, replication, and residues, the study also examines if these were single tools or components of specialized composite tools such as graters. Considering site and temporal differences in the physical composition, morphological characteristics, and manufacturing protocols, we can speculate about the "communities of practice" within and between village households.

Bernal, Juan Pablo [221] see Chatters, James

Bernard, Henri Noel [145] see Cuevas, Mauricio

**Berquist, Stephen (University of Toronto)**

[189]

*Breaking the Gridlock: Interrogating the Significance of Orthogonal Planning in the Andes and Beyond*

Archaeologists have long believed a series of orthogonally planned Middle Horizon sites to correspond to extractive administrative centers, installed by an expansionist state centered on the highland city of Huari. This interpretation—formulated prior to excavations at the aforementioned sites—has underpinned models of a territorial Huari Empire explicitly analogized to the later Inka Tawantinsuyu. However, extensive research at orthogonally planned sites reveals that most cannot be linked to Huari through independent lines of evidence. Moreover, the planning units derive from a shared architectural repertoire common to the region. The assumption that these sites must constitute administrative centers thus leans heavily on the fact of the grid itself, with orthogonal planning read as a manifestation of abstract, authoritarian order imposed onto a more "natural" organic landscape. In this paper, I review histories of gridded planning to challenge the presumed link between orthogonal grids and the authoritarian state. Orthogonality indexes order. However, "order" does not exist in abstraction. Planners define order in relation to specific goals, and this can include constraining the arbitrary exercise of power. By analyzing the spatial organization of orthogonally planned sites and assessing recent archaeological evidence, I argue that we must reinterpret these sites as planned settlements.

**Berrier, Margaret (Jornada Research Institute)**

[86]

*Petroglyph Pathways: Exploring the Possibilities for Cultural Corridors between Eastern and Western New Mexico*

In a recent article, a cluster of 30 sites on White Sands Missile Range in the eastern Tularosa Basin was identified that showed a high frequency of Mimbres pottery as well as a variety of other traits associated with the Mimbres Mogollon (Kurota et al. 2019). The article also suggested that due to a similar cluster on the west side of the San Andres Mountains, traders and possibly migrants crossed through lower mountain corridors such as San Andres Canyon. Studying regional petroglyph and pictographs sites and the distribution of iconographical evidence points to additional trails between the Eastern Mimbres and the more westerly Jornada Mogollon rock art sites. Comparisons of petroglyph and pictographs with the ceramics in the Mimbres Pottery Images Digital Database (MimPIDD), museums, and publications show a shared cosmology.

Bertacchi, Alex [26] see Cerezo-Román, Jessica

Bertacchi, Alex [16] see Mentzer, Susan

**Bertini, Camilla (Harvard University and Newcastle University)**

[132]

*A New Perspective: Early Medieval Glass from Comacchio (Northern Italy) and the "WINDOWGLASSMED" project (H2020-MSCA-IF-2019)*

By analyzing closely dated and typologically defined samples of glass from Denmark, Norway, Sweden, Ireland, Spain, and Italy (LA-ICP-MS; Sr-Nd isotopes), the "WINDOWGLASSMED" project is the first detailed multidisciplinary study focused entirely on well-dated seventh–tenth-century materials to create a detailed, chronologically resolved map of Early Medieval glass in Western Europe, reflecting both trade patterns and practices. Most Western European glass was diluted with strongly colored glass or cullet:

these intense recycling practices are explained as scarcity of raw glass from the areas of primary production due to the shortage of natron, a raw material key to producing glass. Despite these premises, "fresh" Egyptian and Levantine glass was still traded to Western Europe and circulating after the seventh century CE. Moreover, the impact of local secondary glass-working workshops on the centralized model has been often overlooked in favor of recognizing links with the production areas. As part of the WINDOWGLASSMED project, this presentation on the Comacchio secondary glass-workshop glass materials offers a unique perspective on this matter and highlights the necessity of broadening our chemical and isotopic dataset of Early Medieval glass and discussing patterns of glass production and trade from a multidisciplinary point of view.

**Bertrando, Ethan (California Military Department)**

[56]

*CARIDAP 2.0: A Programmatic Approach to NHPA Compliance for Prehistoric Quarries and Lithic Scatters*

In the 1980s, the California Office of Historic Preservation (Cal. OHP) facilitated the development of a program to establish protocols for quickly and easily identifying and assessing a specific archaeological resource type; sparse lithic scatters. This program, the California Archaeological Resource Identification and Data Acquisition Program: Sparse Lithic Scatters (CARIDAP), proved to be very useful for expedient evaluations of this site type. However, its applicability in some parts of California was less effective than in others. Moreover, it could not take into account the development of new technologies that expand the data potential of these types of resources or new theoretical perspectives that assign different values to these site types. Inspired by this early effort, a similar program is being developed for lithic scatters and chipped stone quarries at the military training sites of the California Army National Guard. A review of the basic structure and tenets of this new program explains its functionality and its potential broader application as a template for other regions or resource types.

**Bérubé, Éloi (McMaster University)**

[209]

*The Plants, the Dead, and Public Rituals at Monte Albán: Exploring Mortuary Offerings and Public Offerings through Paleoethnobotany*

At the ancient Zapotec city of Monte Albán (500 BCE–750 CE), ancestors were considered active entities, able to offer protection to their descendants. The living could consult them when needed and made offerings, which often included botanical elements, to maintain this fruitful connection. In this paper, I present the results of a paleoethnobotanical study recently conducted on samples collected from tombs, burials, and public rituals at Monte Albán during the PEMA (1992–1994) project. This study encompasses phytoliths and starch analysis of both artifact and sediment samples. My goal is to demonstrate how plants could be used as mortuary offerings and in public rituals as a way to maintain and strengthen the bond between the realm of the dead and the living. This study is the first of its kind at Monte Albán, offering insight into the role that plants played in those meaningful and charged contexts. I present continuities and changes over time in the botanical assemblages, to illustrate how certain longer-term processes (specifically at the Annales level of the conjunctures) might have affected the relationship between the dead and the living, and how people used plants to maintain and strengthen this bond.

**Bethard, Jonathan (University of South Florida), Katie Zejdlik (Western Carolina University), Zsolt Nyárádi (Haáz Rezső Museum) and Andre Gonciar (ArcheoTek LLC)**

[71]

*Exploring the Székelyföld through the Lens of Bioarchaeology*

The Carpathian Basin has been characterized as pluralistic region for centuries. Among numerous groups residing there, Hungarian-speaking Székely people have figured prominently in the region's history ever since their arrival to the eastern portion of the Carpathian Basin over a millennium ago. Since 2013, bioarchaeological lines of evidence related to the history of the Székely communities have complemented the work of historians and other archaeologists working in the region. These bioarchaeological contributions have enriched what is known about Székely people and have helped to embed their history in a broader European context. The purpose of this poster is to highlight our ongoing work in the region and share our findings from the analyses of nearly 800 individuals from numerous Székely communities dating to the medieval and early modern periods.

Bethard, Jonathan [71] see Zejdlik, Katie

**Bethke, Brandi (University of Oklahoma), William Taylor (University of Colorado Boulder), Emily Lena Jones (University of New Mexico), Sarah Trabert (University of Oklahoma) and Jaron Davidson (University of Oklahoma)**

[122]

*New Perspectives on Indigenous Horse Pastoralism in the North American West*

Domestic horses are often linked to drastic social and economic transformations to Indigenous societies in the Americas. However, the early adoption of horses by tribal nations and their impacts has, in the past, been presented from primarily a historical perspective that tends to favor colonialist views of social change over Indigenous continuity and creativity. This paper presents preliminary results from a multiyear study, utilizing a multi-methodological approach to better understanding when, why, and how domestic horses transformed human lifeways following their reintroduction into the North American West. Central to this work is the integration of data collected from archaeological horse remains using osteological and biomolecular techniques (radiocarbon dating, ancient DNA, stable isotopes, and ZooMS) with ethnohistorical sources, geographic information systems, and Indigenous knowledge, to develop a multiscale interpretative framework for understanding the development of Indigenous horse pastoralism in North America. Recognizing Native horse cultures as a true mode of pastoralism acknowledges the complex range of Indigenous responses to Euroamerican settler-colonialism.

**Bettinger, Robert (University of California, Davis)****[83]***Two Only Slightly More Complicated Models of Technological Investment*

Expanding on an earlier paper by Ugan, Bright, and Rogers (2003), in 2006 Bettinger, Winterhalder, and McElreath (2006) presented a simple model to formalize rational investment of time in tool making: how to make the best performing tool possible in the least amount of time, where tool performance is measured by the rate at which resources are procured or processed when using it. The resulting model was correct in structure but not in the definition of variables or the conclusion that it implied that more costly and less cost effective but better performing tools are a response to increasing volume of handling, which is true but not implied by the model. I correct the definition of variables in the original model, draw different implications from it, and present two equally simple but differently structured models that maximize returns, rather than return rates, per unit of time.

**Betzenhauser, Alleen (Illinois State Archaeological Survey)****[15]***Chair*

Betzenhauser, Alleen [15] see Johnson, Emily

Bey, Bridget [17] see Baitzel, Sarah

Bey, George, III [34] see Parker, Evan

Bey, George, III [18] see Ward, Timothy

Bianchini, Gina [154] see Klokler, Daniela

**Bicho, Nuno (Universidade do Algarve) and João Cascalheira (ICArEHB—Universidade do Algarve)****[98]***The Upper Paleolithic site of Vale Boi, Southern Portugal*

The Upper Paleolithic site of Vale Boi (Algarve, Southern Portugal) is a very complex, multicomponent site with various loci (open air and rockshelter locations), with human occupations starting in the early Gravettian, covering most of the Upper Paleolithic, dating to between ca. 32,000 and 13,000 years ago, and overlaid by Mesolithic and early Neolithic horizons. Vale Boi was discovered in 1998, tested in 2000, and excavated since then up to 2019, with the exception of 2014. Organic preservation is very good, and charcoal, bone, and shell are present; it is the only late Pleistocene site in Atlantic Iberia, south of the Tagus River with those characteristics. This paper will focus on excavation techniques, the stratigraphy, and dating of the site, presenting the archaeological context to the following papers in the session.

**Bicho, Nuno (Universidade do Algarve)****[98]***Chair*

Bicho, Nuno [98] see Barbieri, Alvise

Bicho, Nuno [98] see Belmiro, Joana

Bicho, Nuno [98] see Carvalho, Milena

Bicho, Nuno [98] see Cascalheira, João

Bicho, Nuno [98] see Gonçalves, Célia

Bicho, Nuno [98] see Horta, Pedro

Bicho, Nuno [98] see Marreiros, Joao

Bicho, Nuno [98] see Simón-Vallejo, María

Bicho, Nuno [186] see Skosey-LaLonde, Elena

Bickle, Penny [157] see Scaffidi, Beth

**Bies, Michael (OW Heritage Research L. C.), Danny Walker (University of Wyoming), Dave Vicek (Bonneville Archaeology), Stacey Whitman-Moore (Bureau of Land Management) and Hillary Jones (ACR Consultants Inc.)****[162]***Ochre Processing at Legend Rock State Petroglyph Site, Wyoming*

Archaeological investigations at Legend Rock in 1988 identified two ephemeral features 1.8 m deep in a backhoe trench as potential hearths. Investigations in 2007 15 m away identified a similar feature as an ochre roasting pit, probably for pigment use at the site. The 1988 features were relocated in 2020 and found to be a continuous basin feature 2 × 3 m in size. Feature fill analysis yielded reasonable mineral evidence for mixing/blending pigments in the 2020 features. The high content of titanium within the black pigment was a surprise. OxCal calibration yields the following: the 2007 feature dated to 1065–922 BP at the 95.4% level (BETA 276821). Two dates were derived from the 2020 excavations of 5024–4846 BP at the 95.4% level (Direct AMS 39225) and 5028–4963 BP at the 95.4% level (Direct AMS 29227). Several pictograph elements and petroglyphs with pigment have been recorded at

the site. These dates indicate there was long-term use of pigments, suggesting that additional pictographs and/or pigments applied to petroglyphs have faded from view.

Binding, Ceri [78] see May, Keith

**Bingham, Brittany (University of Kansas), Lauren Norman (University of Kansas), Justin Tackney (University of Kansas), Kristine Beaty (University of Kansas) and Dennis O'Rourke (University of Kansas)**

[68]

*Dogs at the Cape: Canid Differences at Birnirk and Thule Inuit Sites from Northwest Alaska*  
[WITHDRAWN]

**Binkley, Megan (University of Wisconsin, Madison), Sarah Clayton (University of Wisconsin, Madison) and Greg Barrett-Wilt (University of Wisconsin, Madison)**

[162]

*Creating a Brilliant Red: An Interdisciplinary Approach to Reconstructing Colorant Production in Prehispanic Mexico*  
In prehispanic Mexico, cochineal insects (*Dactylopius coccus*) were cultivated to produce vibrant red colorants used for dyeing textiles and feathers, painting surfaces, and decorating bodies. Ethnohistorical documents attest to the cultural and economic significance of cochineal in the Postclassic and colonial periods. Cochineal products were likely also important among Classic period societies such as Teotihuacan, for which evidence is drawn primarily from the archaeological, archaeobotanical, and iconographic record. Here, we introduce an organic residue analysis-based approach to identifying the diagnostic biomarkers of cochineal in ceramic vessels, which likely served as equipment for producing colorants. We present the results of liquid chromatography-mass spectrometry analyses performed on cochineal residue extracted from experimentally replicated sherds. The results of our experiment demonstrate the feasibility of detecting evidence of cochineal production in archaeological ceramics. Our findings also show that dye process variables such as mordanting and heating produce color variation but are not likely to impact organic residue survivability. Our work draws a direct connection between archaeological ceramics and the process of making textiles. This research advances knowledge of the material objects associated with textile production and the ways in which organic residue analysis may be used to access ancient perishable industries.

**Binning, Jeanne (California Department of Transportation) and Joan Schneider (University of California, Riverside, Retired)**

[168]

*The Visibility of Stone Food Pounders in the Polynesian Archaeological Record*

It has been stated that "very few pounders have ever been found in [archaeological] excavations" (Richards and Gunther 2019). In most archaeological contexts, valued stone tools, in good repair, are rare occurrences. For lithic artifacts, manufacturing waste and broken end products are the more common finds. Drawing on ethnohistoric information, manufacturing experiments, and a knowledgeable Native Hawaiian, we discuss why more evidence of food pounders is not being found in the archaeological record of Polynesia.

**Binning, Jeanne (California Department of Transportation)**

[168]

*Chair*

**Birch, Jennifer (University of Georgia), Turner Hunt (Muscogee [Creek] Nation), Louis Lesage (Bureau de Nionwentsio, Huron-Wendat Nation), Jean-Francois Richard (Bureau de Nionwentsio, Huron-Wendat Nation) and Linda Sioui (Bureau de Nionwentsio, Huron-Wendat Nation)**

[223]

*Advancing Indigenous-Led Research Agendas through Collaborations around Radiocarbon Dating and Artifact-Independent Chronologies*

Decentering Western knowledge systems and settler colonial mindsets in archaeological practice includes the need to develop not only conceptual frameworks but practical methodologies that promote decolonization. We argue that the development of independent radiocarbon-based timeframes is one such methodological strategy. This paper describes an approach in which radiocarbon dating is combined with Indigenous-led research agendas between members of the Huron-Wendat and Muscogee Nations and archaeologists. Thematically, population movement and the desire to combat the erasure of early colonial settlement and landscape use are persistent themes. At the same time, the interests of Tribal and First Nations research partners are motivated by a desire to connect archaeological and historical records independent of Eurocentric assumptions about the temporality of material patterning. For the Huron-Wendat Nation, this includes questions about population movement and landscape use in the St. Lawrence Valley and adjacent watersheds. For the Muscogee Nation, this approach involves linking Tribal Towns and Muskogean names to archaeological sites and extending genealogies back into the precolonial era. In each case, the intent is to reclaim the past from Eurocentric cultural-chronological taxonomies and narratives. Additional co-authors include Alexandra Daigle and Victor D. Thompson.

Bird, Broxton [15] see Wilson, Jeremy

**Bird, Darcy (Washington State University), Andrew Gillreath-Brown (Washington State University), R. Kyle Bocinsky (University of Montana) and Timothy Kohler (Washington State University)**

[47]

*Climate, Maize, and Demography: A Case Study from the Southwestern United States*

The expansion of domesticated plants depends on human willingness to grow the domesticate, a climate amenable to the domesticates requirements, and human transport via exchange or mobility. Maize's expansion north into the southwestern United States had an irregular pace. Maize first appeared in Arizona and New Mexico somewhat before 2000 BC, making its way into Utah and Colorado only some 1,500 years later. Maize intensification and dependency took even longer. Delays in the spread and intensification of maize are likely due to the length of time required to develop landraces, but pace will also interact with human population growth rates and climatic variability. Maize landraces have adapted to their locations (e.g., climate, soil, and sun). We present results from a low-frequency temperature reconstruction using pollen data and the Modern Analog Technique, which is then combined with high-frequency temperature reconstructions from tree rings using a wavelet transform technique. Finally, we compare this wavelet-patterned climatic regime to population change in the southwestern United States as represented by modeled population sizes and settlement occupation strategies. This final step will allow us to answer the question: "What was the importance of maize productivity to human paleodemography, and did this importance change over time?"

Bird, M. Catherine [182] see Lurie, Rochelle

**Birge, Adam (University of Texas at San Antonio)**

[224]

*Quarantine and Google Earth: Assessing the Practicality of a Remote Survey in Sajama, Bolivia*

One small silver lining of a global pandemic was the opportunity to assess the capability of Google Earth as a survey method. Google Earth offers high-quality aerial photographs and the ability to view previous aerial images. This method allows for the rapid survey of hundreds of acres without having to leave your house. However, this method has limits. This presentation reviews a remote survey of 100,000 km<sup>2</sup> in the Sajama region of highland Bolivia. The Sajama offers a good case study as the area continues to be largely undeveloped and free of any tree canopy cover. This allows for sites and features to be readily identified in aerial images. Sites such as rectangular prehistoric field systems, fortified hilltop villages (*pukaras*), and the Sajama lines-geoglyphs identified in aerial photos in the 1930s. Portions of the Sajama region have already been surveyed by the author and are used to refine this method. Through this remote survey, dozens of *pukaras* along with hundreds of hectares of supporting field systems and new clusters of Sajama lines were identified. These findings help to better understand settlement hierarchy, economic production, and preferential landforms for past human occupation.

**Bischoff, Robert (Arizona State University)**

[215]

*Projectile Point Networks in Tonto Basin during the Classic Period*

Tonto Basin is a transition zone between different material culture traditions. Ceramics are ubiquitously used to denote cultural identities and social relationships in the US Southwest, but projectile points are a largely untapped resource for studying social interaction. The field of geometric morphometrics provides quantitative ways to compare shapes while utilizing the entire shape of an object, rather than a few linear measurements or angles. Using geometric morphometric methods, similarities in projectile point morphology are compared within Tonto Basin to infer relationships based on shared technology. This study builds on prior work that identified fine-grained differences in projectile point shapes between several sites in Tonto Basin. The similarities in projectile point shapes between sites are formally compared to the relationships inferred through similarities in ceramic style through social network analysis. Different types of material culture represent different social processes, and many recognized projectile point styles overlap and cross boundaries recognized through ceramic styles, including within Tonto Basin. Rather than merely reinforcing interpretations from ceramics, studies of projectile point styles can provide new insights into social relations. This combination of multiple lines of evidence presents a more nuanced understanding of social relations in Tonto Basin during the Classic period.

**Bishop, Caitlin (California State University, Chico)**

[222]

*Archaeological Investigations of "Alaska" at Tule Lake Segregation Center in Northeastern California*

Tule Lake Segregation Center (TLSC) was a place of incarceration for over 18,000 Japanese Americans, yet it remains one of the most understudied incarceration sites of the Second World War. The thesis research presented here seeks to gain insight to a section of TLSC known as Alaska by conducting a pedestrian survey to record site features and artifacts and analyzing ceramics collected by the Bureau of Land Management (BLM) in 1970. This approach under the historical archaeology lens utilizes a public archaeological methodology to understand Alaska's site integrity after 80 years and the material culture remaining on site in comparison to the 1970s BLM Collection. This analysis gives brief insights to the lifeways that existed within Alaska during wartime incarceration and assists in the development of future interpretation. A Heritage Resource Management plan that promotes further archaeological investigation is proposed as an addition to the General Management Plan accepted by the National Park Service in 2018. All in all, the accurate interpretation, preservation, and site management of the historic segregation center is imperative to understanding a holistic and true narrative of the Japanese American incarceration experience.

**Biber, Matthew (Dickinson College) and Donna Nash (University of North Carolina, Greensboro)****[194]***A Paleoethnobotanical Investigation of Food and Status at Cerro Baúl*

The site of Cerro Baúl, located in the Upper Moquegua Valley of Southern Peru, has been the location of decades of research providing valuable input on a range of issues in the Wari Empire. Notably, the identification and investigation of a brewery dedicated to the production of chicha for the Wari state has demonstrated the significant role food played in Wari sociopolitics. In this paper, we build on these patterns by considering the role of maize in the political economy of the Wari colony. Using macrobotanical remains recovered from the summit of Cerro Baúl, we find that maize was a key part of foodways throughout the summit, yet differences in the laborious task of processing maize was not equitable. In particular, we find that those of high status engaged in less processing labor associated with maize than those of lower social status. Using contextual evidence from the excavated units, these differences in food labor relate directly to socioeconomic differences at the colony and speak to the connection between status, food, and labor in the Wari Empire.

Blace, Ante [126] see Countryman, Jamie

Blackadar, Jeff [204] see Carter, Benjamin

**Blackmore, Chelsea (Albion Environmental Inc.)****[156]***Where Archaeology and Compassion Meet: The Legacy of Wendy Ashmore*

As the session organizers note, Wendy Ashmore engaged in a compassionate and intellectually rigorous archaeology, one that inspired and encouraged a diversity of thought among her students and colleagues. Through her examinations of landscapes and households, Wendy provided methodological and theoretical lenses that fundamentally changed how we envisioned the past. She shed light on the numerous and often unrecognized connections that existed not only through space but between peoples of varying classes and genders. In this paper, I explore how Wendy's work inspired a new generation of activist scholars and helped to pave the way for a more socially engaged Mesoamerican archaeology. Not only did Wendy work to bridge theory, method, and practice, she also created a safe space for those of us interested in connecting the past to issues of social justice and equity in the present.

**Blackmore, Chelsea (Albion Environmental Inc.)****[100]***Discussant***Blackwood, Emily (University of Maine)****[78]***Virtual Reality and Archaeology: The Ostra Collecting Station Simulation*

Virtual reality (VR) is a tool with the potential to enhance archaeological site analyses. Incorporating VR provides an interface where data can be used to test various hypotheses and can be continuously updated and modified as new or additional data become available. My research explores using excavation and drone data to develop a 3D virtual environment representative of an archaeological site. The Ostra Collecting Station, a mid-Holocene site located on the northern coast of Peru, is an excellent candidate for this type of technological exploration. The site consists of a radiocarbon-dated midden, slingstone piles that may represent the first defensive mechanisms implemented in the Americas, and a 9 × 8 m granite stone structure, unique in size for its time, positioned on top of an ancient sea-cliff. The original shoreline lies adjacent to the site and limited accessibility to three directions (from the north, east, or south); the present-day shoreline is located 5 km to the west, leaving the site with the appearance of being accessible from all four directions. The use of VR can allow archaeologists to visualize site data with geographic context, site development, and the transition to abandonment much more effectively than when using traditional 2D representations alone.

Blackwood, Emily [88] see St. Amand, Frankie

**Blair, Elliot (University of Alabama)****[45]***Neighborhood Archaeology at Seventeenth-Century Mission Santa Catalina de Guale*

As an intermediate socio-spatial unit, the neighborhood as an analytic unit has most often been applied to urban contexts, though it is also often employed in colonial, multiethnic, or pluralistic settings. In this paper I discuss the utility of "neighborhood archaeology" as an analytic unit for examining the archaeology of Mission Santa Catalina de Guale, a seventeenth-century Spanish mission located on St. Catherines Island, Georgia. Recent ethnohistorical research on the Spanish mission communities of La Florida has done much to document and elucidate complicated patterns of Indigenous population relocations. These migrations, aggregations, and dispersals—due to multiple factors such as epidemics, Spanish *reducción* policies, and flight from antagonistic Native groups—resulted in the formation of complex and diverse colonial social networks. At Mission Santa Catalina de Guale (Georgia), the most pronounced of these was the 1663–1666 aggregation with Mission San Diego de Satuache. Discussing this event, and drawing on recent geophysical and archaeological evidence, this paper considers "the neighborhood" in the context of the aggregated, pluralistic community that formed on St. Catherines Island during the latter portion of the late seventeenth century.

Blair, Elliot [65] see Cajigas, Rachel

Blair, Elliot [8] see Filoromo, Steve

**Blair, Zoe (University of Chicago), Savannah Gann (Wichita State University) and Crystal Dozier (Wichita State University)**  
[69]

*Gendered Trends in Pictorial Representation of Archaeology in Archaeology Magazine: Preliminary Results*

Archaeology, like many STEM disciplines, is often perceived by the public to be a masculine field. *Archaeology Magazine* is the most widely distributed archaeology publication for a popular audience; this study reviews gendered trends for the articles and images published within that magazine over the twentieth century. Photographs of archaeologists were categorized by the number of individuals presented and their gender presentation, as well as whether those individuals were in a field, laboratory, or other setting. This study hopes to better understand trends in the public perception of archaeology, either in support or contrast to gendered trends in academic archaeology education rates, publication and grant trends, and areas of archaeological specialization.

Blake, Michael [141] see Lyons, Natasha

**Blakeslee, Donald (Wichita State University)**  
[143]

*Extraordinary Claims: Reassessing Quivira*

Situated far from the early European colonies, Quivira came to be enshrouded in myth. Reassessment of early documents and archaeological evidence show it to have been the largest native polity in what is now the United States at the beginning of the seventeenth century. This presentation critically analyzes that evidence.

Blanchard, Morgan [24] see Gierck, Lynn

**Bledsoe, Jacob (Berea College), Cody Wolfe (Berea College), Madeleine Hoffman (Berea College), Hunter Bellamy (Berea College) and Lona Cobb (Berea College)**

[66]

*Exploring Home: Spicy Baxter and Family*

Our research focuses on Spicy Baxter, a freed black woman and landowner, and her descendants—namely Alex Baxter—and their lives in Madison County. Using the Berea College and Madison County archives, we discovered the location of the property inhabited by Alex Baxter and his family, where we focused our excavation. There, across 32 pits, we uncovered two bullets, 76 pieces of ceramic, 284 pieces of glass, 86 nails, and a potential foundation, which confirm that Alex Baxter's family lived on the land, likely between the 1870s and 1890s. Additionally, we located documents describing the buildings on the land during Alex Baxter's life, which, combined with our excavation results, can help us paint a more accurate picture of the site. Although our main focus is on Alex's land and the time period when he lived there, we also found evidence of Native American occupation in the same area, before the land was purchased by the White/Baxter family. The Native American artifacts included 1,454 chert flakes of all sizes and one broken projectile point. We are planning to continue our digging and research on this site throughout the coming year.

Blinman, Eric [70] see Rowe, Marvin

Bloch, Lindsay [94] see Fort, Casie

Blom, Deborah [87] see Bruno, Maria

**Blomster, Jeffrey (George Washington University) and Victor Salazar Chávez (George Washington University)**  
[220]

*Sport, Ritual, and Cuisine: Differentiating Quotidian and Public Space in Early Formative Oaxaca*

Differences in quotidian and public spaces both reflect and impact emergent sociopolitical complexity. At the highland site of Etlatongo, in the Mixteca Alta of Oaxaca, Mexico, recent excavations have explored Early Horizon (1400–1000 cal BCE) domestic and public space. These excavations recovered substantial macrobotanical, faunal, and ceramic data from several houses, as well as a public space centered on the earliest highland ballcourts, utilization of which ended with a large termination event. We compare the variety and usage of faunal remains from the public and quotidian spaces, looking particularly at cuisines and how these foods were prepared, with a focus on broths and stews in the public space. We also explore differences in floral remains, although maize played a significant role in both quotidian and public meals. Turning to ceramic frequencies, forms, and motifs between these contexts both support and complicate quotidian and public differences. Finally, several types of artifacts appear to be unique to the public space, including a series of infant bones. We argue that these fundamental differences in activities, cuisines, their presentation, and additional materials complemented and contributed to increasing complexities in cosmology, ontologies, and society at Early Horizon Etlatongo.

Blomster, Jeffrey [201] see Salazar Chávez, Victor

**Blumenfeld, Dean (Arizona State University)****[65]***Measuring Wealth and Inequality at Ancient Cahokia*

This study investigates temporal differences in wealth inequality at the ancient Mississippian site of Cahokia, located in present day Illinois, USA. In addition to being the largest ancient center north of Mexico, Cahokia serves as an especially important case study for investigation, as we can observe the development of a complex regional political economic system, class/rank structure, and changing institutional and leadership strategies. Hence, not only can we observe the relationship between inequality and political economic development but also the development of stratification, rank/class, etc. To do this, I (1) calculated a Gini coefficient for house sizes to assess inequality over the four periods at Cahokia, (2) performed a series of correspondence analyses (which help visualize associations between variables) to understand variation of ceramic artifacts at different houses, and (3) weighted house area (m<sup>2</sup>) in order to understand the relationship between household size and access. The results suggest an associated increase in wealth inequality and social differentiation as population and institutional complexity change. These findings contribute to our understanding of sociopolitical organization of Cahokia, as well as the mechanisms that underpinned its development.

Blumenstein, Sophie [9] see Whitlock, Bethany

**Bly, Zo (Barnard College)****[161]***The Ecological Impact of Herding and the Introduction of Domesticates in the American Southwest*

This poster presents the results of a zooarchaeological analysis of faunal remains recovered from the excavations of a Spanish colonial midden in Embudo, New Mexico. The Embudo land grant was founded in the first half of the eighteenth century, which coincides with the dates for the lowest layers of the midden. This poster uses data on species percentages, cut marks, and breakage patterns to analyze the foodways and disposal patterns of this time period and then compare with later time periods, particularly after the introduction of the railroad at the end of the nineteenth century. The data is further used to shed light on the ecological impact of herding on the surrounding Embudo landscape.

Bocinsky, R. Kyle [47] see Bird, Darcy

**Boda, Seth, Metin Eren (Kent State University) and Andrew Boehm (University of Oregon)****[57]***A Comparison of Stone and Bone Flake Cutting Efficiency*

Around the prehistoric world, stone, and to a lesser extent, bone flakes have been used as cutting implements. While resource availability likely played a role in the implementation of stone or bone flakes, what exactly are the functional differences between these raw materials' cutting ability? Here, we present a controlled cutting experiment using replica stone and bone flakes and the Kent State University Experimental Archaeology Laboratory's Instron Materials Tester. We quantify the differences stone and bone flakes require to cut through a standard substrate. Our results speak to prehistoric hunter-gatherer technological organization, artifact function, and raw material use.

**Boddie, Jane****[27]***Evergreen Plantation: Defining Identity from Multiple Perspectives*

This paper will examine the importance of Evergreen Plantation from the following perspectives: national, owner, director, farmer, community, tourist and scholar. Using these divergent perspectives to define the identity of Evergreen in the present, it will attempt to project its future.

**Bodenstein, Nicole (USDA Forest Service) and Kristina Hill (USDA Forest Service)****[66]***USFS Resource Assistant Program*

The USDA Forest Service Resource Assistant (RA) Program is a paid internship program designed to provide recent graduates, current students, and underrepresented groups with valuable natural and cultural resource management mentorship and experience with the Forest Service. For archaeologists, this program is a pathway to employment in the Forest Service, as well as a valuable learning experience for those seeking to advance their cultural resource management skills. Upon successful completion of the program, the RA earns their Direct Hire Authority (16 USC 1725), which makes it much easier for the Forest Service to hire the certificate holder. In this poster, I will discuss the RA program and how it compares to other opportunities for early career archaeologists, as well as discuss a brief history of the program. The purpose of this poster is to inform archaeologists of the benefits of this unique program. Research will include the results of a questionnaire sent to current archaeologists participating in the program, as well as past participants and mentors of participants.

Boehm, Andrew [57] see Boda, Seth

**Boileau, Arianne (Simon Fraser University)****[85]**

*Maya Political Economy on a Colonial Frontier: A Zooarchaeological Analysis of Elite and Non-elite Households at Lamanai, Belize*  
 During the colonial period, the Maya living in the Spanish borderlands retained much of their community-level hierarchical systems. At Lamanai, Belize, I investigate the relationship between status and animal use. To document the production and distribution of animal resources between elite and non-elite households, I examine differences in animal taxa, skeletal elements, exploited habitats, crafted objects and debitage, and nonlocal fauna. These methods allow me to assess whether different households had access to or controlled different sets of animal resources (both in terms of taxa or skeletal portions) and engaged in different practices involving animals and animal parts (e.g., artifact manufacturing, provisioning). Although elite and non-elite exploited similar animal resources, preliminary data suggest provisioning of turtle and fish parts by the non-elite to the elite households, and the sole involvement of elite households in marine shell artifact manufacturing. European animals were rare at the site but slightly more common in elite middens, suggesting possible restricted access to these new resources introduced by Europeans. Overall, this study provides insight into how social status continued to be expressed and reaffirmed in Indigenous communities living on the colonial frontier.

Boileau, Arianne [96] see Thornton, Erin

Boivin, Nicole [186] see Goldstein, Steven

Boivin, Nicole [186] see Mueller, Natalie

Boivin, Nicole [99] see Wilkin, Shevan

Bond Reis, Lucas [216] see Zedeño, María Nieves

**Bongers, Jacob (University of East Anglia), Vanessa Muros (UCLA), Colleen O'Shea (Fine Arts Museums of San Francisco) and Juliana Mejía (University of Caldas)****[155]***Painting Personhood: Exploring Red Pigment Practices in the Chincha Valley, Peru*

We integrate archaeometric methods (e.g., X-ray diffraction) with archaeological and bioarchaeological analyses to investigate red pigment practices in the Chincha Valley of southern Peru. Human remains and grave goods with this material were found in over 100 aboveground and subterranean graves associated with the Late Intermediate period (LIP; 1000–1400 CE), the Late Horizon (1400–1532 CE), and the colonial period (1532–1825 CE). We employ our multidisciplinary methodology to characterize over 30 red pigment samples, draw insights into the provenience of pigments and how they were processed and applied to human remains, and identify individuals selected for painting. Results suggest that cinnabar and red ochre were mixed in water and applied to skeletonized, fleshed, and fragmented human remains of different age and sex categories. We interpret red pigment practices in Chincha as part of prolonged social processes that transitioned the dead into new states of being and relationships with the living.

**Bonneau, Adeline (Université de Sherbrooke), Peter Mitchell (University of Oxford), Brian Stewart (University of Michigan) and David Pearce (University of the Witwatersrand)****[155]***The "Wonderstone": Investigations on the Use of Pyrophyllite by San People in South Africa and Lesotho*

Pyrophyllite is a type of phyllosilicate mineral from the same family as talc. It is called "Wonderstone" by Khoe-San people and is thought to have "certain qualities regarded as unique" (Nel et al. 1937:5). Hollmann (2007:143) even hypothesizes that "the wonderstone rock itself, with its wondrous properties, was the great Water Snake's body." Wonderstone is found in the northwest province of South Africa, where hundreds of engravings were recorded. This rock is also attested as body paint and medicine among Khoe-San communities. Recently, this rock has been identified as the paint used to draw an eland, a human figure, and a snake at site ARAL180, Lesotho, hundreds of kilometers far from any known source of pyrophyllite. In this talk, we will describe the known use of pyrophyllite as a pigment, the process to turn it into paint, and our preliminary investigations that aim at locating the source of pyrophyllite used for Lesotho paintings, which are unfortunately not dated.

**Borck, Lewis (New Mexico Highlands University)****[148]***Research and Publication Bias and the Erasure of History*

Archaeologists actively create history to remember some places, while other areas are ignored, or forgotten. These choices create a cycle that is replicated into the future through research, mentorship, teaching, and public engagement. If we want the public to care about equity in the present, we need to research it in its own right and not as simply an opposition to inequality or complexity.

**Borgens, Amy (Texas Historical Commission)****[46]***The Dugout and the Lost City*

A chance discovery by a fisherman in late 2018 revealed an enigmatic Texas coastal site. A 20-foot dugout canoe, uncovered by storm activity, was embedded in a larger archaeological context suggestive of both nineteenth-century ranch features and early twentieth-century coastal developments. Research indicates the site may be associated with the John Singer Ranch—a Civil War-era settlement popularized in Texas treasure-hunting folklore for Singer's fabled lost cache of coins and jewels. Dubbed the Lost City after it was discovered eroding out of the beach in 1931, the site of the ranch remains uncertain in this dynamic coastal

environment. While the discovery of this curious south Texas archaeological site may begin a new chapter in this more than century-old search, it comes with the very real danger of reigniting interest in the “treasure” and looting on private and public property.

**Borges, Caroline (UFRPE—Brazil [Federal Rural University of Pernambuco])**

[23]

*Understanding the Diets, Foodways, and Food Production Systems during Colonial Times in the City of Recife, Northeast Brazil, through Animal Bones: First Insights*

The sugar cane plantation, the trafficking of human chattel, and the Atlantic commerce system characterized the European settlement of the Brazilian territory from the sixteenth century onward, but little is known about the diets, foodways, and food production systems in urban contexts in the colonial times. This research focuses on the port of the city of Recife, northeast Brazil, from the seventeenth to the nineteenth century, with specific attention to the eighteenth century. Faunal remains are abundant in this context, the majority from domestic livestock, and coming from the refuse areas behind commercial houses, including butcher shops. According to historical documents, this area of the port was a place of “controlled” freedom for a large enslaved community, who worked and marketed services and goods, including animals and their by-products such as meat and leather. The zooarchaeological analysis helps us to understand the use of the animals and the variability in the resources employed. The identification of the species consumed and of the treatment of the carcasses reflect diet patterns and the foodways of the people who lived and interacted in this place of exchange, to reveal the lives and food habits of the colonial population of the city of Recife.

Borovinic, Nikola [147] see Tostevin, Gilbert

Borrero, Luis [85] see Belardi, Juan

Borrero, Luis [92] see Taylor, William

**Borrero, Mario (University of California, San Diego)**

[59]

*The Classic Period Maya Figurines of the Southern Belize Region: A Comparison Between Nim li Punit and Lubaantun*

Figurines are small portable pieces of art that were popular in the Maya world throughout its history. Typically ceramic, they portray individual humans, animals, and mythic beings in an assortment of poses and scenes. The results of an iconographic analysis of 159 figurines excavated in the last 10 years from two Late Classic period sites in the southern Belize region, Nim li Punit and Lubaantun, are reported. In the Late Classic there is a shift to mold-made figurines trending toward mass production and distribution of certain motifs. The study of this dataset contributes to our understanding of elite household activities, gender, and social roles. Together, this collection serves as representative of the inhabitants’ focus on everyday women’s work, ball game players, and warriors. Figurines as objects of the everyday provide a unique opportunity to view Maya life from the perspectives of commoner to elite and from the mundane to the supernatural. These themes are compared to other published collections initiating a discussion on regional differences.

Borrero, Mario [210] see Stroth, Luke

Borzic, Igor [226] see Zaro, Gregory

**Bosco, Samantha (Cornell University) and Brad Thomas (SUNY Environmental Science and Forestry)**

[141]

*Skarù:rě Food Forest Project: Community Engaged Indigenous Agroforestry at the Tuscarora Nation*

Agricultural research often overlooks critical social justice implications underlying the history of dispossessed land and appropriated Indigenous crops. The Skarù:rě Food Forest is a community-based aspect of a doctoral research program studying how nut trees contribute to Indigenous food sovereignty and climate smart agriculture in what is today New York State. As one of the most nutritionally dense plant-based foods, nuts were important components of food economies among Indigenous peoples in the Eastern Woodlands, notably the Haudenosaunee (People of the Longhouse, also known as “Iroquois”). Archaeological, ethnographic, and historical-ecological evidence indicate that the Haudenosaunee may have managed forests partly to favor such nut trees. However, contemporary food sovereignty efforts have mostly focused on maize and other annual crops. Although these crops are culturally foundational, nuts can play an important role in food and language revitalization efforts within contemporary Haudenosaunee territories. Here we discuss a variety of approaches used to engage Tuscarora Nation members with culturally relevant approaches to agroforestry. By addressing social justice concerns within agricultural science, we demonstrate how the Skarù:rě Food Forest Project can provide a methodological testing ground for Decolonial Participatory Action Research that expands ongoing food sovereignty, community health, and education initiatives.

**Bossio, Laura (University of Michigan)**

[65]

*Survey at the Williams Site (33-WO-7a) of Northwestern Ohio: Transitional Archaic and Late Prehistoric Perspectives*

The Williams site (33-WO-7a), a large Late Archaic–Early Woodland cemetery, was discovered in 1969 by Robert J. Cufu and was excavated in the 1970s by Earl Prael, David Stothers, and others. Because of published literature based on those excavations, the cemetery component is well-known and has intrigued archaeologists for decades, particularly due to lingering questions about the people who used it. In spring 2021, a pilot pedestrian survey was conducted at the Williams property in an effort to address

questions about those Late Archaic–Early Woodland peoples. Interestingly, the survey revealed a density of data from late prehistory, an unexpected component. This intensive survey, along with an accompanying geophysical survey and analysis of private collections, together create an understanding of the importance of this particular locale along the Maumee River throughout time, as the Williams property contains dense and significant components from multiple time periods. This pilot project also speaks to the strengths of marrying various minimally invasive research methods to produce rigorous insights and results.

Boswell, Alicia [129] see Koons, Michele

Boswell, Alicia [84] see Mullins, Patrick

Bottaini, Carlo Emanuele [155] see Vidal-Lorenzo, Cristina

Bottura, Silvia [18] see Vázquez de Ágredos Pascual, María Luisa

Boudreaux, Edmond, III [8] see Krus, Anthony

**Boutin, Alexis (Sonoma State University), Victoria Calvin (Sonoma State University) and C. Midori Longo (Sonoma State University)**

**[159]**

*How Should General Education Archaeology Curricula Respond to the COVID-19 Pandemic?*

Archaeology, like many disciplines that study the past, often justifies its existence by invoking the trope that we must learn about the past in order to create a better future. The COVID-19 pandemic is itself an event that will enter the historical record. Thus, the universality of this public health crisis is a unique opportunity to assess the relevance of university-level archaeology curricula. We studied an upper division general education course on the archaeology of complex societies at a public liberal arts college in California. The instrument of data collection was a questionnaire administered at the end of the fall 2020 and spring 2021 semesters. Students read an article about archaeological approaches to pandemics, then reflected on how it connected to course content and to their own experiences during the COVID-19 pandemic. Analysis of responses via thematic coding suggests that the course themes of climate and environment, social hierarchy and political organization, and trade and exchange resonated most with students. We also identified emergent concerns with disease, occupational status, and migration, suggesting that these themes are increasingly relevant to archaeology students in the COVID era.

**Boutin, Alexis (Sonoma State University)**

**[75]**

*Discussant*

**Bowden, Taylor (University of Tennessee, Knoxville), Todd Ahlman (Texas State University), Ashley McKeown (Texas State University) and Nicholas Herrmann (Texas State University)**

**[166]**

*An Isotopic Study of an Eighteenth-Century Cemetery (SE600) on St. Eustatius, Dutch Caribbean*

St. Eustatius (Statia) is a small island in the Dutch Caribbean, first colonized by the Dutch in 1636. The island's free port made it a cornerstone of trade in the colonial Caribbean. The thriving trade economy on Statia cultivated an economic environment set apart from others in the Caribbean with all parties, free and enslaved Africans included, having opportunities to participate in trade. This study presents the results of stable isotope analysis of human remains from the Godet Cemetery, a cemetery for enslaved Africans associated with the Godet Plantation. This study uses nitrogen, oxygen, and carbon isotopic analysis to examine the diet, health, and residential history of these individuals. The results of this study found that these individuals have an intermediate diet consisting of C<sub>3</sub> and C<sub>4</sub> plants and a considerable quantity of marine proteins. Preliminary interpretation of the residential history suggests that four individuals were recent migrants to Statia in the years prior to death.

**Bowen, Corey (University of Illinois at Chicago) and Marc-Antoine Vella (Sorbonne Université)**

**[87]**

*Constructing a Tiwanaku Hydrocosmology*

Inhabitants of the southern Lake Titicaca Basin, Bolivia, developed innovative agricultural practices to manage the region's dynamic climate and the lake's ever-shifting shores. Research has focused on the irrigated systems of raised fields that line the basin's river valleys and, in particular, on debating the role of Tiwanaku in centralizing their construction and management as part of its emergence as the preeminent center of the south-central Andes in the fifth century CE. Whereas this literature has typically concentrated on the economic aspects of hydraulic infrastructure, John Janusek's work on features within the urban core of Tiwanaku instead considered the human experience of a cityscape infused with flowing water and the ideopolitical centrality of water in Tiwanaku cosmology. This paper presents the results of recent remote sensing fieldwork and GIS analysis that have expanded our knowledge of the nature and extent of hydraulic engineering in the Tiwanaku heartland and clarified its integration with, and adaptations to, local ecologies. We interpret these findings through contemporary literature on "hydrosociality," which understands water management as both the process of distributing water as a material resource and of dictating the systems of knowledge through which water is defined and used.

Bowman, Robert [31] see Sattler, Robert

**Bowser, Brenda (CSU Fullerton)**

[25]

*Seeking Refuge in a Predatory Landscape: An Amazonian Perspective*

This presentation will explore the concept of predatory landscape in Amazonian anthropology, the theoretical principles that are evoked, and implications for archaeology. By focusing on Indigenous ontologies and histories in Amazonia, these anthropological approaches humanize Indigenous warfare, raiding, and captive-taking, displacement and conflict, colonial incursions, and people in voluntary isolation. Indigenous concepts, experiences, and histories of the predatory landscape also inform archaeology in Amazonia, framing archaeology as Indigenous history, connecting the present to the ancestral past, to document and explain Indigenous responses to colonialism, including the significance of places and things, the movement of people at many scales, the formation of coalescent societies, and settlement pattern shifts. In this presentation, the concept of a multivalent predatory landscape and its implications for archaeology as Indigenous history of the *longue durée* will be illustrated with research in the Sápara Territory in the Ecuadorian Amazon.

**Bowser, Brenda (CSU Fullerton)**

[25]

Chair

**Boyd, Carolyn (Texas State University), Diana Radillo Rolón (Texas State University), James Dering (Shumla Archaeological Research & Education Center) and Karen Steelman (Shumla Archaeological Research & Education Center)**  
[101]

*El Núcleo Duro: In Search of the Archaic Core in PRS Pictography*

Scholars argue that there are core cosmological concepts within contemporary Mesoamerican religious traditions that have roots in the Archaic period. Current research in the Lower Pecos Canyonlands along the US/Mexico border supports this hypothesis. Patterns in Pecos River style (PRS) murals created by foragers more than 3,500 years ago correspond to patterns embedded in the myths and rituals of Uto-Aztecan-speaking peoples, most notably the Wixáritari (Huichol). Identification of these patterns led to the interpretation of the White Shaman Mural as a pictorial creation narrative. However, to identify the depth and timing of PRS involvement in the Archaic core requires an analysis of additional rock art sites. In September 2021, Texas State University and Shumla Archaeological Research & Education Center launched a three-year project to (1) create digital reproductions of murals across the region and establish their technical history through stratigraphic analyses, (2) identify recurring PRS pictographic elements and core motifs, (3) build a chronological model for PRS through radiocarbon dating, and (4) share mural reproductions with Huichol elders in Mexico to determine whether PRS core motifs are recognizable and embedded in their cosmology. This paper presents our methods and initial results for the project.

Boyd, Carolyn [101] see Dering, James

Boyd, Carolyn [101] see Radillo Rolón, Diana

Boyd, Carolyn [101] see Steelman, Karen

**Bracamonte Lévano, Edgar (Museo Tumbas Reales de Sipán)**

[189]

*Mochica, Cajamarca y Wari en el valle de Lambayeque: Encuentros rituales públicos en Santa Rosa de Pucalá*

Entre los años 650 a 850 dC. Santa Rosa de Pucalá fue el escenario de encuentros rituales motivados por problemas climáticos. Esta investigación sugiere la presencia de peregrinos de la sierra cajamarquina, el valle bajo y el litoral lambayecano, reunidos para hacer frente a una crisis económica, generando cambios sociales, políticos, rituales y el dinamismo del territorio. Los datos aquí presentados indican que la estructura sociopolítica del valle de Lambayeque fue más compleja que la simple nucleación y reestructuración del orden social, basado en una centralización en Pampa Grande de poblaciones culturalmente homogéneas. Finalmente, las escasas evidencias Wari de la fase Santa Rosa 1 (650–750 dC) reflejan que inicialmente sólo poblaciones cajamarquinas se desplazaron a la costa, llevando en algunos casos bienes de tradición ayacuchana. Posteriormente, el incremento de estos materiales y la presencia Wari en Cajamarca generaron la modificación de este escenario.

**Bracken, Justin**

[130]

*Building Walls: Fortification and the Establishment of Unequal Space in the Maya Late Preclassic (400 BC–AD 150)*

Inequality in past societies left its enduring mark on the bodies of the people who composed that society and the terrain on which they lived. These marks accumulated and were altered, erased, and overridden by subsequent activity. Determining the significance of these indicators, then, and using them to understand past social structures and make inferences regarding long-ago interpersonal interactions requires careful assessment of temporality and co-occurrence. Incorporating practice theory as the basic model for tracking intergenerational continuities and changes, this paper assesses the establishment of bounded, fortified space in the Late Preclassic (400 BC–AD 150) at the site of Muralla de León, located in the Petén Lakes region of northern Guatemala. The site plan established in that period included a monumental encircling stone wall. This partitioning of space, with apparent defensive intent, took place amid the increased spread of sociopolitical complexity within the area, as indicated by the greater number of polities containing large populations and exerting regional influence. The encroachment of complexity (and therefore inequality) into the eastern Petén Lakes region is addressed here through a spatial analysis of the physical bounding of Muralla de León by the construction of these fortifications.

**Bracken, Justin****[130]**

Chair

**Brady, James (Cal State LA), Cristina Verdugo (UC Santa Cruz) and Lars Fehren-Schmitz (UC Santa Cruz)****[177]***Delving into the Structure of Ancient Maya Cave Rituals: Archaeological and Paleogenetic Insights*

The documentation that bones of sacrificed individuals had been moved within the Cueva de El Duende, Dos Pilas, Guatemala, and Midnight Terror Cave, Belize, is highly significant in that it parallels data recorded for other artifact categories in the Cueva de Sangre, Dos Pilas. Taken together these data suggest that ancient Maya cave rituals may have followed a ritual circuit within the caves in which portions of an offering were left at multiple stops along the way. Such circuits have been proposed based on the presence of constructed pathways within Midnight Terror Cave. Ethnographic data also confirm that circuit type rituals are performed in the Yalan Na in Santa Eulalia, Guatemala. This proposal considerably expands our understanding of the actual constituents of ancient Maya cave rituals.

**Brady, James (Cal State LA)****[177]**

Chair

Brady, James [177] see de Anda, Guillermo

Brady, James [170] see Saldana, Melanie

Brady, James [177] see Verdugo, Cristina

**Brady, Niall (Archaeological Diving Company Ltd.)****[42]***Later Medieval Transformations: A Fragility of Binding Ties or the Absence of Joined-Up Thinking*

The late twelfth century in Ireland was a time of transformation that included the construction and development of formal villages. Many have survived and are the small towns of the Irish landscape today. Many others did not survive while others contracted. The Deserted Medieval Village (DMV) is a cornerstone of medieval rural settlement studies. Irish researchers have focused attention on identifying DMVs in the landscape, and associate them with the colonial imposition of Anglo-Norman interests. This paper introduces two DMVs: one in the east of the country at Castlemore, Co. Carlow; the other in the west of Ireland, at Ballintober, Co. Roscommon. Castlemore today is completely abandoned, while Ballintober is a contracted settlement. The paper touches on neglected areas of research, including the origins of medieval village formation and the processes of contraction and desertion. The matter of community is at the heart of the study and the narrative is complex. It shows where there are gaping holes in our knowledge quest; such gaps surprisingly occur in the more recent past, when one might expect the written record to be more informative than it is. The paper argues for the role of material culture in helping to fill the gaps.

Brake, Madison [20] see McKenzie, Emily

**Branch-Raymer, Leslie (Paleobot Consulting) and Terry Powis (Kennesaw State University)****[8]***Paleoethnobotany of the Wilbanks Phase Cummings Site, Bartow County Georgia*

Recent investigations by Kennesaw State University completely excavated a thirteenth-century residential structure at the Cummings site, a small community 2 km downriver from the Etowah Mound site, Bartow County, Georgia. Dating to the Early Wilbanks phase (AD 1250–1325), this well-preserved Mississippian period residential structure offers an opportunity to examine little studied Wilbanks phase archaeobotany in a community that is contemporaneous with Etowah Mounds. The only other completely excavated Early Wilbanks phase residential building was located adjacent to Etowah's Mound B and dug by A. R. Kelly in the 1950s. This archaeobotanical study examines macro-floral remains extracted by water flotation from soil samples collected from feature contexts within the excavated structure. This study assesses relative contributions of indigenous cultigens and gathered plants, changes in subsistence over time, and wood use patterns. Results of this investigation add to our understanding of Wilbanks local ecology and exploitation of plant resources in the Etowah Valley.

**Brandl, Michael (Austrian Academy of Sciences, Austrian Archaeological Institute), Christoph Hauzenberger (University of Graz.), Peter Filzmoser (Vienna University of Technology), Maria Martinez (Amerind Foundation); and Thomas Einwoegerer, Marc Händel, Ulrich Simon, Roswitha Thomas, Irene Petschko, and Christine Neugebauer-Maresch (Austrian Academy of Sciences, Austrian Archaeological Institute)****[149]***Gravettian Lithic Resource Management Reveals Hunter-Gatherer Mobility: The Krems-Wachtberg Case in Austria*

The Upper Paleolithic (Gravettian) site of Krems-Wachtberg in the Austrian Danube region has gained international fame due to the discovery of two infant burials and contains a rich lithic assemblage comprising of over 44,000 stone artifacts. Detailed lithic raw material studies through the application of the multi-layered chert sourcing approach (MLA) combining petrographic (stereomicroscopic) analysis of each individual specimen and geochemical analyses using laser ablation-inductively coupled plasma mass spectrometry (LA-ICP-MS) with subsequent statistical data treatment using compositional data analysis (CODA) of selected materials allowed us to determine the provenance of the majority of the chipped stone artifacts. The combination of GIS-mapping of the obtained provenance information in tandem with technological studies applying transformation analysis revealed particular resource management strategies of this Upper

Paleolithic society and provided indications for potential seasonal routes. The comparison with contemporaneous sites shows that similar patterns of raw material procurement are observable throughout the Gravettian in Austria and Moravia.

**Brandt, Steven (University of Florida), Mica Jones (Washington University in St. Louis), David Ruiz Menjivar (University of Florida), Michaela Zewdu Tizazu (University of Florida) and Osman Yusuf Mohamed (University of Florida)**  
[186]

*Buur Hopping in the Eastern Horn of Africa: Inselbergs as Late Pleistocene to Mid-Holocene Islands of Resiliency, Risk, Stability, and Refuge for Hunter-Gatherer Populations of Southern Somalia*

This paper draws on new lithic, zooarchaeological, and other data of curated Late Pleistocene/Holocene archaeological assemblages from early to late twentieth-century excavations at three major sites in the Buur (granite inselberg) region of southern Somalia. The data are used to further test Dyson-Hudson and Smith's economic defendability model (EDM). The model predicts changes in the demography, mobility, and subsistence strategies of hunter-gatherers responding to Late Pleistocene to mid-Holocene fluctuations in the density and predictability of critical natural resources. During the arid Marine Isotope Stage (MIS) 2 ~29–14.5 cal ka, foragers utilized the granite inselbergs of southern Somalia as "islands of risk, resiliency, and refuge." But during the "African Humid period" of MIS 1 ~14.5–5 cal ka, hunter-gatherer populations looked upon the inselbergs as "islands of richness and stability." We conclude by discussing how and why the predictive nature of the EDM is more complex than our first use of the model in the 1980s.

**Brandt, Steven (University of Florida)**

[6]

*Discussant*

Brandt, Steven [94] see Fort, Casie

Brandt, Steven [90] see Kelsey, Brady

Brandt, Steven [90] see Kracht, Olivia

Brandt, Steven [90] see Ruiz Menjivar, David

Brandt, Steven [76] see Smith, Benjamin

Brandt, Steven [76] see Taffere, Abebe

Brandt, Steven [90] see Wilson, Evan

**Brannan, Stefan (New South Associates)**

[197]

*Current Issues and Future Directions in the Successful Implementation of Radiocarbon Dating to Cultural Resource Management Projects in the United States*

This paper discusses the current issues and future directions for the successful implementation of radiocarbon dating in cultural resource management (CRM) in the United States. Radiocarbon dating is underutilized in CRM due to an overreliance on culture historical frameworks—particularly ceramic chronologies and lithic typologies. This is due to the historical context for the development of CRM policy starting in 1960s. This legal framework privileges the interpretation of sites with the explicit goal of legislative compliance. The result of this rationale for CRM archaeology results in the underutilization of radiocarbon dating despite the obvious benefits of enhanced chronological resolution and methodological efficacy. These problems are compounded from insufficient sampling, not enough dates to resolve age estimates, and reliance on average intercepts and underutilization of Bayesian chronological modeling. Including radiocarbon dating in an enhanced CRM toolkit involves bringing absolute chronological frameworks to the forefront of data analysis and interpretation, utilizing Bayesian modeling, and reducing the need to rely on analogy or large-scale, poor resolution datasets and boiler-plate culture-historical frameworks. To demonstrate these benefits, this paper highlights a recent project in North Georgia that incorporated shallow geophysical survey, targeted excavations, and the collection of radiocarbon dates to elucidate specific cultural phenomena.

Brannon, Shannon [24] see Campbell, Janice

**Brantingham, P. Jeffrey (UCLA)**

[149]

*A Macroevolutionary View of Hunter-Gatherer Mobility*

Archaeological evidence of hunter-gatherer mobility is often analyzed using ethnographic-scale models of individual foraging trips and residential moves as a point of reference. The archaeological record rarely offers such fine-grained resolution due to site formation processes and the limitations of geochronology. Here I explore an alternative macroevolutionary approach that asks how the mobility regimes active within a region balance the evolutionary tradeoff between exploration and exploitation. I use a statistical point process model that equates independent-in-time occupations with mobility-driven exploration and dependent-in-time occupations with mobility-driven exploitation and show how theoretical expectations can be tested against the observed archaeological record. Implications for social learning and niche construction models are explored.

**Brast, Caitlin**

[144]

*Glazing Over Differences: Picuris Pueblo and Rio Grande Glaze Ware Typologies*

Located in the northeastern corner of the Pueblo world, Picuris Pueblo exists on the fringe not only geographically but also archaeologically. The archaeology of Picuris contains numerous opportunities for what is now New Mexico's smallest pueblo to celebrate and promote their heritage. However, much of the northern Rio Grande remains understudied and new research can

highlight the unique cultures of this region. Currently, Alfred Kidder's century-old work on Pecos Pueblo is the main source of information for the area, and the ceramic typology it includes is applied across the region, despite the author warning against this. Through attempting to apply the Pecos typology to a small collection of Rio Grande Glaze Ware rims collected from Picuris and noting where the two differ, this research finds that the ceramic typologies as they stand are not fully transferable across the diverse groups of the northern Rio Grande region. In discovering where the current system falls short, this paper opens the door for further research into tailoring the typology to suit sites across the area. Once a baseline is established for differences at Picuris, higher-level analysis of these differences can be carried out.

Braswell, Geoffrey [210] see Stroth, Luke

Braun, David [204] see Davies, Benjamin  
Braun, David [90] see Tizazu, Michaela Zewdu

Bray, Asya [39] see Russ, Jon

Brazelton, Lisa [20] see McKenzie, Emily

Bredehoeft, Keila [221] see Arano Recio, Diana

Breecker, Daniel [209] see Locker, Angelina  
Breecker, Daniel [179] see Rabinowitz, Adam

**Breithoff, Esther (Birkbeck, University of London)**

**[50]**

*Conflict Landscapes as Outdoor Museums: The Arts of Living on a Damaged Planet in Laos and Beyond*

From 1964 to 1973, during an event known as the "Secret War," the USA dropped 2.1 million tons of bombs on Laos, turning the latter into the most heavily bombed country (per capita) and one of the most UXO-contaminated places on earth. Following the conflict, war debris has been recycled in a range of different ways to create what have become locally known as "bomb villages," where bomb casings have replaced wooden house stilts and metal debris from the war is turned into tourist paraphernalia. Rather than thinking of such places as simply tragic witnesses to past conflicts, I argue that we might instead conceptualize these villages as an expansive network of distributed "outdoor museums" in which local responses to military waste tell a global story of conflict as a twentieth-century Anthropocene hyperobject (Morton 2013; Breithoff 2020), and as creative spaces in and through which to learn what Anna Tsing and co-authors refer to as the "arts of living on a damaged planet" (Tsing et al. 2017).

**Brennan, Tamira (Illinois State Archaeological Survey)**

**[136]**

*Curation as Fieldwork: Combating the Crisis through Curriculum*

This paper discusses the necessity of incorporating curation into undergraduate and graduate archaeology curriculum as a matter of course and provides proof of concept for successfully tackling unfunded collections work through an intensive, experiential (field school) format. It argues that changing how the next generation of archaeologists understands the excavation-curation relationship is the most realistic way to stem the curation crisis and reframes working with orphaned and legacy collections as salvage archaeology, to be treated with the same urgency as other threatened cultural resources.

Brenner Coltrain, Joan [47] see Wilson, Kurt

Brenton, Ruth [91] see Sherfield, Anne

**Brewer, Jeffrey (University of Cincinnati) and Christopher Carr (University of Cincinnati)**

**[104]**

*Evaluating Small Depressions as Quarry-Reservoirs at the Classic Maya Site of Yaxnohcah*

In this study, we present new data from the ancient Maya site of Yaxnohcah in southern Campeche, Mexico. The data—drawn from lidar-based GIS analysis, field inspection, and the excavation of two small closed topographical depressions—suggest many of these small features served a dual function. Initially quarried to provide construction material, this left a closed depression that was then sealed to create a household reservoir. We classify these water storage features as quarry-reservoirs. The ubiquity of these small quarry-reservoirs represented an important community water source outside the sphere of direct elite control.

**Brewer, Jeffrey (University of Cincinnati)**

**[104]**

*Chair*

**Brewington, Jordan****[1]***Discussant***Bria, Rebecca (University of Texas at San Antonio), Kimberly Munro (Otero College) and Matthew Piscitelli (SEARCH/Field Museum)****[129]***Temples in Process, Not Periods: Reevaluating Narratives of Early Community Practice and Interaction across North-Central Peru*

This paper examines the timing, tempo, and geographic distribution of early temple forms and ritual practices across north-central Peru to reevaluate the role of inter-community relationships in the development of early Andean complex society. Decades of research on Late Pre-ceramic and Initial period (~3000–900 BC) temple construction sequences, changing architectural conventions, and exchanged ritual objects have guided archaeologists' understanding of early complexity because these data provide evidence of how Andean people worked together to produce monumental spaces, share materials and ideas, and shape meaning. We build on this scholarship by consolidating and analyzing an up-to-date dataset of building sequences and <sup>14</sup>C dates published from early temples across the north-central coast and highlands. Our analyses consider both emerging and more established narratives regarding early regional networks by tracing when, where, and how communities shared building technologies and ritual protocols, or alternatively, sought to distinguish themselves from others. We further examine these social and chronological patterns to rethink whether and how our labels for distinct ritual and architectural traditions have both enabled and hindered our understanding of variability across and relationships between coastal and highland communities.

Briceno, Jesus [3] see Fuchs, Peter

Brickley, Megan [17] see Avery, L. Creighton

Bridgeman, Lauren [216] see Zedeño, María Nieves

**Bridges White, Elizabeth (Illinois State Archaeological Survey) and Mary Hynes (Illinois State Archaeological Survey)****[114]***Moorehead's Cahokia Legacy: Curation and Archival Contributions*

Warren K. Moorehead's early archaeological work at Cahokia Mounds is well-known for its role in supporting the scientific perspective that Indigenous Peoples constructed monumental earthworks in North America. A self-trained archaeologist of the late nineteenth century, Moorehead carried out projects in Illinois in the 1920s and 1930s, during the era of emerging professionalization in archaeology. The University of Illinois supported Moorehead's expeditions as a means of museum collection building, during the period in which archaeology was formalized as an academic subdiscipline of anthropology. Unfortunately, research during this period excluded Indigenous voices and often produced problematic material assemblages, lacking aspects of documentation we take for granted today. This poster summarizes the curation history of Moorehead's Cahokia collections and contextual archival material, curated by the Illinois State Archaeological Survey at the University of Illinois at Urbana-Champaign. We discuss the importance of parallel archival and material curation in working with legacy collections, and the impact of the curation crisis on work with and research utilizing these materials. Future possibilities for collaborative collections management are explored, and comments and discussion are invited.

Brien, Aaron [101] see Castañeda, Amanda

**Brighton, Nancy****[81]***Sonny and the African Burial Ground*

In 1991, the New York African Burial Ground was rediscovered as part of the construction of a federal office building in lower Manhattan, setting the stage for intense and extensive discussions not only about slavery and the lives of enslaved people in colonial New York but also about collaboration with the public and descendant communities as part of federal archaeology projects. After a decade of analysis and research, there was sporadic planning for the final publication of reports, the reinterment of the individuals, and the site's memorialization. Ineffective communication between the federal government, the public, and the research team and changes in leadership at the General Services Administration and the research team further delayed the publication of reports and the long-awaited reburial, as other discoveries and projects pulled everyone in other directions. The project remained in limbo. Originally requested to help with another site, the Corps, under the direction of Sonny Trimble, was asked to develop a plan with the researchers, the federal government, and the public to bring the story of the African Burial Ground home to New York City. Concentrating on the common goal of reburial and remembrance, the Corps reconnected everyone to finally realize this vision.

**Brighton, Stephen (University of Maryland)****[82]***The Materiality of Cultural Resilience: The Archaeology of Struggle and Transformation in Post-Famine Ireland*

In archaeology, cultural resilience is primarily associated with the rise and fall of prehistoric and protohistoric societies. In terms of historical or post-medieval archaeology, little, if any, work has linked the impact of traumatic events, whether natural or caused by

uneven and oppressive social and political economic relations and power structures, to concepts of culture collapse and resilience. In essence, modern world archaeologists have not really addressed the question of how do cultural groups respond to events that shake their very foundations? The aim here is to employ cultural resilience theory to structure a discussion about material evidence reflecting the dynamic resilience of Irish society following the mid-nineteenth-century catastrophic event of the Great Hunger. In this paper I apply theory to explain the archaeological data and historical research associated with three sites in the Skibbereen area in County Cork, demonstrating shifting notions of daily life, as well as the creation and re-creation of cultural practices from the end of the Great Hunger through to the first decades of the twentieth century.

**Britt, Krystal (University of Illinois at Chicago)**

[173]

*Geochemical and Petrographic Analysis of Mogollon Brown Ware from the Middle Little Colorado River Valley, Northern Arizona*  
This poster explores Pueblo III period (1125–1275 CE) ceramic production practices in and around the middle Little Colorado River valley of northern Arizona. Groups occupying the region during the Pueblo III period maintained highly diverse ceramic interaction networks; however, utility ware assemblages at regional Pueblo III sites are almost universally dominated by Mogollon Brown Wares. I explore Mogollon Brown Ware production practices using a combination of archaeometric techniques, including laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) and petrographic analysis. To date 292 ceramic sherds (corrugated Mogollon Brown ware) and 10 local clay samples from seven Pueblo III sites have been analyzed using LA-ICP-MS and 55 ceramic sherds and clay samples have been subjected to petrographic analysis. In this poster I summarize the results of these analyses and explore the possibility of local production practices and unique intraregional manufacturing traditions.

Britt, Tad [127] see Watt, David

**Brittenham, Claudia (University of Chicago)**

[55]

*Portraits of Mountains? Tepictoton and the Problem of Portraiture in Aztec Central Mexico*  
In this talk, I will consider the Aztec images known as *tepicoton*. The Florentine Codex and other sixteenth-century sources tell us that the small figures, made out of amaranth grain, were the images of mountains. But what does it mean for a mountain to have an image, and for that image to be humanoid in form? How does the emic Nahua category of the *ixiptla* intersect with that of the portrait? How can the operation of portraiture help us understand the *tepicoton*, and how, in turn, can the *tepicoton* help us examine the boundaries of portraiture as a practice?

**Britton, Emma and David Ingleman (University of California, Santa Cruz)**

[41]

*Back to Boas, Forth to Sunseri: An Academic Phylogeny of Judith A. Habicht-Mauche*

Judith A. Habicht-Mauche is known for, among other things, her application of situated learning theory to study archaeological communities of practice and for teaching the History of Archaeological Theory as a professor of anthropology at the University of California, Santa Cruz. To illustrate both continuity and change in the communities of archaeological practice ancestral to and descended from Prof. Habicht-Mauche, this poster presents her academic phylogeny. This lineage begins with Franz Boas and continues through Fay-Cooper Cole, Cornelius Osgood, Benjamin Irving Rouse, and Stephen Williams—Habicht-Mauche's own dissertation supervisor. Prof. Habicht-Mauche has mentored countless undergraduate and graduate students and has served as the primary thesis supervisor for several of her own students, including Jun Sunseri, Sarah Peelo, Emma Britton, Chester Liwosz, and Danielle Dadiago. We used a combination of historical research and questionnaires to investigate the theoretical perspectives, fields of methodological expertise, culture area foci, and temporal specializations of these scholars. While some scholarly threads such as research rooted in robust culture historical contextualization and an interest in the Indigenous cultures of North America clearly tie these current practitioners to their historical academic lineage, innovation and methodological diversity are also woven throughout this scholarly tradition.

**Brock Morales, Amanda (University of Florida)**

[214]

*Risk as a Factor in Sustainability: Long-Term Relationships between Settlement Patterns and Environmental Hazards in the Callejón de Huaylas, Peru*

People in the Central Andes have a long history of creating social mechanisms to respond to environmental hazards and changing landscapes. In the Callejón de Huaylas, in the North Central highlands of Peru, risk of geological hazards such as earthquakes, landslides, glacial lake outburst floods (GLOFs), and avalanches is characteristic of the highland landscape. Additionally, the long-term occupation of the region, from 7000 BCE through modern times, suggests a complex, ongoing relationship between the occupants of the valley and its dynamic environment. Because of the sustained presence of human occupation and the high probability of geological events in the region, environmental risk may have been a salient factor (though of course not the only one) in how past societies implemented strategies for sustainable futures. Through a GIS analysis of relationships between long-term regional settlement patterns, geologic risk models, and historic hazards and events, this paper examines the spatial relationships between environmental risk and settlement decisions through time. In examining these relationships, my research engages with risk as contingent on both social and environmental circumstances construing both the kinds of environmental crisis that past societies encountered and their responses as having multiple dependencies.

Bromley, Gordon [129] see Rademaker, Kurt

**Brooks, Allyson****[7]***Discussant***Brosseder, Ursula (Bonn University)****[99]***Forging an Empire: A Comparative Approach to Iron Metallurgy of the Xiongnu and the Mongol Empires*

In this talk I discuss different trajectories of iron metallurgy within imperial contexts. A review of iron smelting metallurgy of the Xiongnu Empire (third century BCE to first century CE) shows that their furnace type is quite unique and that the imperial need of iron as well as the structure of the empire pushed the surge of iron metallurgy, also in neighboring regions. By the late first and early second millennium CE a fundamental change in iron metallurgy is noticeable in the Minusinsk Basin and the area along the northern shore of Baikal Lake: small furnaces in the form of rectangular boxes lined with stone slabs became common. The demand for iron during the Mongol Empire must have been extraordinarily high as the excavation of the capital city of Karakorum with its retrieved masses of iron debris testifies. However, we lack conclusive evidence for iron smelting from this period in Mongolia. A closer look into other imperial production schemes might elucidate our meagre understanding of Mongol period primary production of iron by comparing different approaches to secure iron supply.

**Brotherson, David (University of Sydney)****[218]***Angkor's Encore: Demise, Transformation, and Residual Occupation of an Agrarian-Urban Complex*

Low-density settlements flourished in the tropics of the premodern world, yet had vanished by the early modern period. The vast agrarian-urban sprawl at Angkor was the capital of the Khmer Empire which dominated mainland Southeast Asia until the mid-thirteenth century. Angkor's subsequent demise, the relocation of the capital, and reordering of the Khmer state are linked to a range of factors including climate instability. While it has long been known that a handful of temples hosted a residual, monastic community, ceramic scatters found across the complex suggest the broader landscape of "Greater Angkor" also underwent a restructuring of activity. The Greater Angkor Project's ceramics surface collection focused on acquiring temporally diagnostic, imported Chinese trade wares to identify evidence of settlement enduring into the early modern period. This paper reports these findings, and we discuss the spatial and temporal characteristics of the assemblage between the thirteenth and seventeenth century CE.

Broughton, Jack [68] see Dalmas, Daniel

**Brouwer Burg, Marieka (University of Vermont), Tawny Tibbits (Chadron State College) and Eleanor Harrison-Buck (University of New Hampshire)****[172]***A Stone by Any Other Name? Tracing the Economic and Social Significance of Ground Stone Tools*

Ground stone tools are ubiquitous in the archaeological record although they have received comparatively less analytical attention than other artifact categories such as ceramics or lithic tools. A good deal of ethnographic and ethnoarchaeological attention has revealed nuances of ground stone production techniques and practical uses; however, there has been little theorizing about the archaeological exchange and movement of these goods or their deeper social meanings. Our previous research has focused on obtaining secure geochemical signatures for an ancient Maya ground stone tool assemblage by sourcing granite outcrops in modern-day Belize, which has enabled us to trace the provenance of certain archaeological assemblages. Assuming that heavy yet fragile ground stone tools were moved primarily out of necessity, we explore three non-mutually exclusive models of movement: producer-consumer transactions, consumer-consumer exchange, and consumer residential moves. We outline our expectations of material correlates for the archaeological record based on these three hypotheses and employ geospatial analysis to heuristically investigate potential routes of movement and exchange. This work will help to broaden understandings of the organizational importance of ground stone tool production, exchange, and usage within ancient Maya society and will shed new light on the social dimensions of these tools.

**Brouwer Burg, Marieka (University of Vermont)****[37]***Discussant*

Brouwer Burg, Marieka [172] see Haverland, Fiona

**Brown, Emily (Aspen CRM Solutions)****[211]***Discussant*

**Brown, James (Washington State University)****[131]***Creating Neighborhoods: Cultural, Spatial, and Temporal Evaluation of Large Shell-Bearing Sites in the San Juan Islands of Washington State*

Research on Indigenous place making has emphasized the importance of Indigenous place names in creating an indelible social memory of those locations. On the Northwest Coast many of these places and/or landscapes have been considered cultural keystone places. CKPs are the landscapes, geological features, current plant and animal communities, and archaeological and paleo-ecological records that document Indigenous histories. Many factors can be employed in identifying culturally significant places, including place names, oral histories, and the longevity of site occupation. Through decades of prior research, the archaeological record of the San Juan Islands has been generated into a robust dataset of radiocarbon dates of shell-bearing sites. Many of the sites vary greatly in size, the largest of which are English Camp (45SJ24) and Cattle Point (45SJ1) that occupy locations of great significance to Indigenous communities and are surrounded by many archaeological sites that very well may have been contemporaneous to the occupations of these significant places. Analysis using connecting place names, oral histories, radiocarbon data, and nearest neighbor statistics on previously published data from the San Juan Islands shows that large archaeological sites with lengthy occupation spans are attractors for past peoples to inhabit the landscape surrounding these significant places.

Brown, James [47] see Hackenberger, Steven

**Brown, M. Kathryn (University of Texas at San Antonio) and Jason Yaeger****[153]***Early Maya Communities, Integration, and Creation of Sacred Landscapes: A View from the Mopan Valley, Belize*

In this paper, we examine how lowland Maya communities were integrated in the Preclassic period through networks of E Groups and shrines that constituted the sacred landscapes of the Mopan Valley, Belize. We present new data that suggests the Preclassic Maya demarcated communities by placing hilltop shrines on the axial alignments of early E Groups at the sites of Arenal and Early Xunantunich. Our excavations at the eastern and western hilltop shrines at Early Xunantunich indicate that these were places for offerings, ritual mesas, and erection of wooden posts that likely symbolized world trees at the four corners of the cosmos. We argue that these hilltop shrines were part of a broader ritual circuit and provide an archaeological correlate for the scenes depicted in the San Bartolo murals. Furthermore, new lidar survey data has provided us with an even broader view of the landscape and the integration of neighboring communities across the valley's landscape. Three Middle Preclassic communities—Arenal, Early Xunantunich, and Callar Creek—were integrated by intentionally placing their E Groups on the same 10-km long alignment. This suggests an unanticipated degree of interaction, collaboration, and perhaps affiliation among the region's Preclassic farming communities.

**Brown, M. Kathryn (University of Texas at San Antonio)****[34]***Discussant*

Brown, Mary Catherine [161] see Kasper, Kimberly

**Brown, Matthew (Farmingdale State College), Cory Look (Brooklyn College), Tamara Varney (Lakehead University), Reg Murphy (Museum of Antigua and Barbuda) and Christopher Waters (National Parks Authority of Antigua and Barbuda)****[166]***Eighteenth- to Nineteenth-Century Unmarked Burials at Freeman's Bay Antigua during a Time of Deadly Disease within English Harbor's Military Complex*

This paper presents the preliminary findings from the excavations carried out at the historic period burial ground of Freeman's Bay, Antigua. Between 2009 and 2010 hurricane damage to the beach at Freeman's Bay exposed portions of an unmarked mass grave. Recovery efforts and expanding excavations, both rescue and scientific, have been carried out since 2009. Drawing from archaeological, bioarchaeological, spatial, GIS, and isotopic analyses, we discuss the potential origins and health and disease of those buried on the beach at Freeman's Bay. Additionally, we will discuss the significant differences in the mortuary practices associated with the graves at Freeman's Bay compared to the contemporary military and hospital cemeteries associated with the eighteenth- to nineteenth-century British Military Complex in Antigua. We present these findings within the framework of potential correlating epidemics during this time period.

Brown, Matthew [78] see Look, Cory

**Brown, Nicholas (Yale University)****[74]***Tracing the Trajectory of Chavin Art and Technology in the Second and First Millennia BC*

Chavin Punta is the focus of recent, ongoing investigations directed by the author in the Chaupihuaranga Canyon of the Central Andean Cordillera of Pasco, Peru. This research reveals the existence of a monumental ceremonial center with elaborate stone art and architecture, which is related to the site of Chavin de Huántar in Áncash. Additionally, the site exhibits decorated pottery nearly indistinguishable to Wairajirca ceramics of Kotosh, Shillacoto, and Jancao in Huánuco, suggesting strong ties between the Andean highlands and Amazonian lowlands in central Peru. To understand the apparent diversity of Chavin art, this paper tracks the diachronic development of lithic and ceramic technologies through the second and first millennia BC. Using securely excavated radiocarbon and artifact sequences as its temporal foundation, this research illustrates the importance of local and regional artistic

and technological innovation as a force of societal change at Chavin Punta that distinguished it from other sites in the Chavin and Wayra phenomena. At the same time, this study highlights the key role that long-distance travel and exchange played in the creation of widely shared symbolic identities that integrated Chavin Punta into these interregional social formations of the second and first millennia BC, Initial period–Early Horizon/Formative period.

Brown, Nicholas [192] see Young, Michelle

Brown, Samantha [85] see McCartin, Madison

**Brownstein, Korey (University of Chicago), Margo Schwadron (NPS Southeast Archeological Center), William Damitio (Washington State University) and Paige Hawthorn (Washington State University)**

[18]

*Ancient Residue Analysis on Ceramics and Shell Cups from Several Sites in Southern Florida*

In the following study, we utilized techniques in ancient residue metabolomics to investigate the chemical composition of ceramic fragments and shell cups. A total of 89 samples were selected from multiple sites in the State of Florida: Everglades National Park, Canaveral National Seashore, and Biscayne National Park. Most of the samples were ceramic body fragments and included 30 ceramic types from plain to decorated forms. The artifacts were submerged in three different chemical solvents sequentially (first: TA, second: APW, and third: MTBE) resulting in a total of 267 extract samples. These extracts were then analyzed by LC-MS. Of the 89 artifact samples, 12 samples contained detectable levels of caffeine. Caffeine was identified by matching the retention time (3.76 min), as well as the mass spectral peak fragments (110 m/z, 123 m/z, and 138 m/z) of this compound to a chemical reference standard. Furthermore, of the three solvents used for the sequential extraction method, the APW extracts had the most caffeine positive samples. Theobromine was also detected in low amounts; however, the abundance of this compound was too low to confidently determine if this compound was present in the artifacts.

**Brumbaugh, Laura (Washington State University)**

[5]

*Examining Centralization of Social Influence in the Late Pueblo I Northern Southwest*

The study of social responses to stressors becomes increasingly important as our current society faces challenges brought on by advancements in technology, unprecedented health crises, and a changing global climate. By studying social changes in the past, we can begin to examine the effects of stress and change on aspects of community structure. This paper presents the results of an examination of one of those aspects, political centralization, via the analysis of pit structure floor assemblages from four sites occupied during the late ninth century in the Mesa Verde region of the northern American Southwest. Specifically, I explore the potential for using the archaeological record to investigate the centralization of social influence in the absence of any explicitly centralized political system. I use patterns in ceramic and faunal remains associated with the use of pit structures to assess the potential for the individuals occupying these structures to aggregate social influence. These patterns are examined within each site, and the patterns for all four sites are compared to investigate regional variability in the distribution of social influence within a community during the late Pueblo I period (AD 750–900).

**Brun, Catherine (Université de Montréal), Julien Riel-Salvatore (Université de Montréal) and Claudine Gravel-Miguel (School of Human Evolution and Social Change)**

[61]

*Experimental Archaeology as a Method to Reproduce the Ornaments of the Burial of Arma Veirana*

The study of prehistoric burials is essential to reveal the social role of individuals within their society. In 2017, the burial of an early Mesolithic (~10,000 cal BP) newborn child was discovered in the cave of Arma Veirana (Erlì, Italy). Here, we study the grave goods accompanying this burial to explore the social structure of prehistoric peoples at the dawn of the Holocene. The funerary material found with the burial is composed of 93 perforated *Columbella rustica* and four perforated *Glycymeris* sp. with different levels of wear. The main objective of our research is to study experimentally how those were made and worn, and to help us understand their place within the group's social structure. We turned to experimental archaeology to inform us about the physical constraints and possible techniques involved in the creation of shell ornaments, as well as to explore how physical movements may have been affected by their wear. In this presentation, we will discuss the relevance of experimental archaeology as the methodology of choice for this research, while demonstrating its effectiveness with the results obtained. In addition, we will discuss the importance of studying beads among prehistoric societies.

**Brunette, Jeremy (Los Alamos National Laboratory)**

[66]

*Recovery Methods: Examining the Archaeology of the Manhattan Project at Los Alamos, New Mexico*

The creation of the Manhattan Project National Historical Park in 2015 has brought an increase of interest and appreciation for the history of the Manhattan Project and the 17 park and park-eligible buildings and structures at Los Alamos National Laboratory. These park features allow for the interpretation of the scientific history of the Manhattan Project while also allowing visitors to imagine what it would have felt like to conduct groundbreaking science within hastily made “temporary” structures during World War II. The 17 buildings and structures in the park make up a small part of the landscape in which scientific research and development was conducted during the Manhattan Project, and Los Alamos National Laboratory archaeologists have begun examining other activity areas within Los Alamos National Laboratory. This poster will discuss how initial investigations into the archaeology of the Manhattan Project at Los Alamos have made significant discoveries including the remains of former high explosives testing sites,

significant scientific equipment, inscriptions in concrete and personal items as well as the potential for collaboration with current Los Alamos scientists to further our understanding of the Manhattan Project at Los Alamos.

**Bruno, Maria (Dickinson College)**

[37]

*Discussant*

**Bruno, Maria (Dickinson College), Sonia Alconini (University of Virginia), Claudia Rivera (Universidad Mayor de San Andres), Deborah Blom (University of Vermont) and Nicole Couture (McGill University)**

[87]

*The Barrios of Tiwanaku: Revisiting the Urban Neighborhoods of an Ancient Andean City*

One of Janusek's major contributions to the archaeology of Tiwanaku was his inquiry into the structure and dynamics of the urban population within and surrounding the monumental center. Through his excavations at Akapana East and consideration of excavations by Rivera, Couture, and others in distinct residential areas of the city, he explored the concept of urban neighborhood, or barrio, and its nature in the city of Tiwanaku. In this paper, we revisit his models for these barrios by exploring old and new data from Mollo Kontu and Chiji Jawira. New analyses of ceramics, food remains, and burial patterns, including isotope analyses and radiocarbon dates, shed new light on the people who resided in these neighborhoods, the activities they carried out, and their connections to the city within which they resided.

**Brunso, Karen**

[1]

*Moderator*

[75]

*Discussant*

**Brunson, Katherine (Wesleyan University) and Brian Lander (Brown University)**

[185]

*Deer and Humans in Early North China: From Symbiosis to Scarcity*

For thousands of years, deer were one of the main sources of food, antler, and skins for people in North China, but the ecological significance of deer use remains unexplored. People in Neolithic and Early Bronze Age China modified landscapes in significant ways through earthworks, irrigation, and other agricultural practices. In particular, people often used controlled fires to clear agricultural fields, abandoning fields after a few years and moving on to new land. Frequent shifting of farmed lands created a mosaic of vegetation types that is the ideal habitat for deer, and the faunal remains excavated at these sites make clear that people hunted and ate a lot of deer. This paper examines zooarchaeological, textual, and paleoecological evidence to explore the relationship between humans, deer, and the landscape. We suggest that people were probably aware of what types of vegetation attracted deer and that they intentionally managed their landscapes to make them better deer habitat. However, after domesticated cattle, sheep, and goats arrived from Western Asia, people had less need for deer. As farming intensified, human impact on the landscape grew and deer were gradually eliminated from people's diets and from the landscape.

Brunson, Katherine [158] see Hirai, Nina

**Bryant, Paula (Illinois State University/Illinois State Archaeological Survey)**

[164]

*Chicago's "Plymouth Rock": The Landscapes and Archaeology of the Chicago Portage*

Designated by the National Park Service as a National Historic Site, the Chicago Portage in the Forest Preserves of Cook County (FPCC) is arguably one of the last natural remnants where one can see a glimpse into the birthplace of Chicago. While recognized for its connection to French exploration and settlement, this area had been in use for thousands of years before Marquette and Joliet first traversed it in 1673—and to this day it is a major transportation corridor. This presentation will address the unique features this landscape offered to early travelers and an overview of the range of archaeological sites associated with the area. Investigations into these sites have varied from compliance work, avocational archaeology, field schools, and FPCC Master Plans for interpretation and management. Over the past two decades, several Illinois Department of Transportation and FPCC projects offered opportunities to identify additional archaeological resources in the vicinity. In the mid-late 1970s the FPCC and the Field Museum of Natural History ran a series of field schools at the Laughton site, presumed to be an 1830s trading post. A brief history exploring the field school excavations and the recent ISAS reexamination of the materials will be discussed.

Bryant, Paula [164] see Baltus, Melissa

**Brzezinski, Jeffrey (University of Colorado Boulder)**

[49]

*Space, Place, and Other-Than-Human Traces: Going beyond People to Deconstruct the Public/Private Dichotomy in Precolumbian Coastal Oaxaca*

Scholarly critiques of Habermas's theory of the public and private spheres have highlighted the "in-between" spaces where people negotiated the terms of political authority in early complex societies. Archaeological research on the Indigenous ontologies of the Americas has furthered this discussion by recognizing that landscapes, deities, ancestors, buildings, objects, and animals were

often imbued with a life force and a comparable degree of agency to humans. Rather than focusing solely on in-between spaces as “stages” for the political-economic practices of people, this paper considers other-than-human beings on equal agentive footing in the constitution of communities. I examine archaeological evidence from ceremonial precincts at Cerro de la Virgen, located on the Pacific coast of Oaxaca, Mexico. The community reached its peak in the Terminal Formative period (150 BCE—250 CE), during which residents constructed the site’s ceremonial center and dozens of surrounding terraces. Recent fieldwork has demonstrated that the site’s monumental buildings not only exhibited varying degrees of accessibility and exclusivity, but also a suite of communal practices that intimately commingled people, cached offerings, the bodies of ancestors, tools, and built spaces in ways that starkly differed from other communities in the lower Río Verde valley.

Bubel, Shawn [225] see Pacheco, Ellen

Buchanan, Briggs [187] see Eren, Metin

Buchanan, Briggs [20] see Mika, Anna

Buchanan, Briggs [187] see Mukusha, Lawrence

Buchanan, Briggs [57] see O'Brien, Michael

### **Buckley, Gina (Missouri University Research Reactor)**

[157]

#### *Demography, Agency, and Status: How Migrants Carved Their Place into Teotihuacan Society*

The ancient city of Teotihuacan (AD 1–550) in central Mexico was the most populous urban center in Mesoamerica during the Classic period and a multiethnic hub that attracted migrants from all corners of this expansive region. The study of in-migration at various Teotihuacan neighborhoods has a long history, particularly the identification of migrants through isotopic analyses. “Pull factors” or causes of migration to the city have also been explored, including an expanding economy, large labor demands, and population stability due to high mortality rates. Left understudied is the impact that migrants had on this urban community demographically and culturally. This presentation uses new strontium isotope data from the La Ventilla district, the largest skeletal population recovered at this city, combined with osteological and mortuary data to discuss migrants’ role in Teotihuacan society through various theoretical frameworks. The demographics of migrants will be explored to understand population growth and stability within this community. This presentation will also take an in-depth look at the agency and status of migrants to examine how newcomers and the Teotihuacan host community negotiated place-making and compromised to coexist for over five centuries.

### **Buckner, Paul (PaleoWest)**

[222]

#### *Small-Seed Specialization at Upper Elevations in the Southern Cascade Mountains: Spatial Modeling of Ground Stone Technology in Lassen Volcanic National Park, California*

Archaeological studies of the uplands surrounding Lassen Peak have frequently reported the “apparent association” between woolly mule’s ear (*Wyethia mollis* A. Gray) abundance and ground stone distribution. Conclusive evidence for this association would be significant as mountain landscapes are often characterized as patchy resource environments which incentivized logistical hunting of large game over plant-oriented foraging behaviors. Through a comparison of Maximum Entropy (MaxEnt) spatio-environmental probability models, the presence/absence of ground stone technology within Lassen Volcanic National Park was evaluated against a range of environmental predictors to test the hypothesized co-occurrence of ground stone and *W. mollis*. The results of this comparison show a clear distributional relationship does exist between ground stone presence and *W. mollis* abundance, a trend that is not apparent for sites where ground stone technology is absent. These findings suggest that transhumant hunter-gatherers specially provisioned sites with ground stone tools in areas of high *W. mollis* abundance. When contextualized within the larger regional record for the Southern Cascade Mountains, this evidence for systematic procurement and processing of small-seeds from *W. mollis* is not demonstrably associated with declining foraging efficiency and is most consistent with a pattern of economic specialization.

### **Buckser, Sasha (University of Colorado Boulder)**

[68]

#### *New Tricks for Old Dogs: Adapting the Manchester Combined Forensic Facial Reconstruction Method to Archaeological Canids*

Forensic facial reconstruction is an important tool for the study of ancient skeletal remains, facilitating new kinds of both scientific and emotional engagement with the past. While hominid forensic facial reconstructions are widely used in archaeology and biological anthropology, minimal attempts have been made to create a standardized system for reconstruction of non-hominid animals. Using photogrammetry, 3D printing and modeling, sculpture with polymer clay, and paleopathological analysis, I adapted the Manchester Combined method of forensic facial reconstruction to modern and archaeological canids from the early historic Hopewell site Brown’s Bottom (33RO1104), Ohio, a collaborative site of SUNY Geneseo led by Dr. Paul Pacheco. The accuracy of this reconstruction was then compared to a digital, 2D reconstruction and one produced using the traditional Russian Method. The adapted method, along with an original Canid Marking system and Tissue Depth Matrix, produced a sculpture more efficient and accurate than the Russian Method. This work provides a starting framework to adapt the system of forensic facial reconstruction for non-hominid species, for the purposes of both research and public engagement.

**Budziszewski, Adam (University of Warsaw)****[174]***Cremation in Middle Balsas Region: Preliminary Study of Funerary Urns from Los Tamarindos (Huetamo)*

During the salvage project in the Huetamo region in 2015, 42 funerary urns containing cremated human remains were excavated at the Los Tamarindos cemetery. This study presents the results of the bioarchaeological study of cremains from 10 excavated burials. The macroscopic evaluation of the burned human remains allowed for the determination of preliminary information about the biological profile and paleopathologies of the deceased buried in the Los Tamarindos cemetery. Moreover, basic information about the fragmentation of remains and the technology of cremation rites could also be determined and described. The results of the fragmentation analysis will be compared with samples studied in Europe in order to present intra- and interpopulation variability, as well as the differences between the Los Tamarindos sample and cremation burials from other parts of the world.

**Bueno-Ramírez, Primitiva (Universidad de Alcalá), Rosa Barroso (Universidad de Alcalá) and Rodrigo de Balbín-Berhmann (Universidad de Alcalá)****[155]***Pigments for the Dead: Megalithic Scenarios in Southern Europe*

The archaeometric study of the pigments used in the decorations of Iberian megaliths has provided interesting information. The difficulty of preserving the paint is one of the problems that has marked the historiography of megalithic art studies in the rest of the European Atlantic façade. Our team has applied protocols aimed at the detection of paint remains with good results in French and English megalithic sites. In this presentation we will discuss some of the aspects that can be deduced from the analyses carried out, including <sup>14</sup>C dates on charcoal pigments, as well as the social implications of the use of pigments obtained from long distances. Some western European megaliths were conceived as rich death scenarios. Paintings and engravings on the walls, figurines deposited with the grave goods and large stelae in the open areas of the monument construct highly coded and technically elaborate visual discourses. Their chronologies between the fifth and second millennium BC define the funerary customs of the megalith-building groups in western Europe.

Buffalini, Cole [169] see Wadford, Tabatha

**Buffington, Jordan (Illinois State University)****[143]***Categorization of Metals in Historic Cherokee Archaeology*

Historical archaeology of Cherokee contexts has given little attention to historic metals such as iron (WMYᵒᵒY) and brass (Cᵒ). Published research including historic metals defines these materials as Anglo-American, rather than Cherokee, despite having no evidence of Anglo-American occupation at the sites. Cherokee materials are often displayed using South's Carolina Artifact Pattern, which South developed for colonial Anglo-American contexts only. With published research being the main form for communicating data among archaeologists, the presentation of materials matters greatly. The communication of materials using a method based on Anglo-American rather than Cherokee cultural values loses much of Cherokee material culture. This research looks at historic metals in Cherokee archaeology and categorizes them based on Cherokee culture. By presenting this research, hopefully, it will spark researchers working with Indigenous groups to consider how their materials are communicated and presented carefully.

**Buikstra, Jane (Arizona State University)****[217]***Discussant*

Buikstra, Jane [226] see Hannigan, Elizabeth

Buikstra, Jane [217] see Schach, Emily

Bullain Miranda, Katherine [124] see Calla Maldonado, Sergio

**Burant, Eric****[178]***The Coins: A GIS Analysis of Temporality at the Milwaukee County Poor Farm Cemetery*

Previous research on the Milwaukee County Poor Farm Cemetery (MCPFC) identified two distinct material culture classes: grave goods and grave inclusions. These two broad categories support the interpretation of four potential burial classes, but these associations do not represent any temporal spatial patterning. Spatial patterns in the distribution of temporally diagnostic material culture such as coins, footwear, and jars or containers, as well as positively identified individuals, can be used to refine temporally significant burial clusters across the cemetery. This paper utilizes GIS modeling techniques and analyses of spatial data, archaeological data, and historical documentation to provide a more accurate and complete spatial understanding of the history and land use at the MCPFC. The results of this study refine the current assumptions of land use patterns based on coffin handle distributions and confirm the larger spatial patterning of temporality across the cemetery.

**Burge, Keri, Brigid Ogden (University of Tennessee, Knoxville), Barbara Heath (University of Tennessee, Knoxville) and Anneke Janzen (University of Tennessee, Knoxville)**  
[203]

*Exploring Early Colonial Animal Management Practices in Virginia: A View from Coan Hall*

When European settlers first arrived in North America, they brought new species and land management practices with them. Detailed information about the agricultural and animal husbandry practices of early European colonists can be viewed through carbon and nitrogen isotopic analysis of archaeofaunal materials. This paper analyzes faunal materials from the multicomponent site of Coan Hall (44NB11) in Northumberland County, Virginia, which offers insight into early colonial life in the Northern Neck. Specifically, faunal remains consisting primarily of cattle, pig, and caprines were excavated from a cellar with two main occupation periods. Here we present a diachronic view of animal management strategies in the seventeenth and early eighteenth centuries through stable isotope data, which elucidates the change in taxon-specific management practices over time employed by the occupants at Coan Hall as colonial settlement took hold in the Chesapeake.

**Burger, Richard (Yale University) and Lucy Salazar (Yale University)**  
[74]

*Reconsidering the Chronology and Significance of Cardal's Sunken Circular Patios*

The late Initial period site of Cardal in the Lurin Valley on Peru's Central Coast is unique in having 10 sunken circular patios, many of which are situated on the outer edge of the site's U-shaped terraced platforms. Investigations in 1985 and 1987 hypothesized that these features dated to the final phases of the site's occupation and that they were used for ceremonial activities of small social groups such as lineages or sodalities. Investigations in 2018 and 2019 have produced evidence that some patios had a much longer history at the site, with excavations revealing four superimposed patios in one case. Excavations of another sunken patio revealed an earlier similar circular structure whose interior was decorated with a colored clay frieze depicting a previously unknown mythological scene of monstrous supernatural creatures, reinforcing the interpretation of the patios as having been used in religious activities.

**Burger, Richard (Yale University)**  
[74]  
*Chair*

Burgess, Don [215] see Lyons, Patrick

**Burham, Melissa (University of Arizona)**  
[49]

*Minor Temple Complexes as Semi-public Spaces at Preclassic Ceibal, Guatemala*

In complex societies, social-spatial groups, such as neighborhoods and districts, develop at levels between the household, city, and polity. As the primary sphere of interaction outside the household, the relations and negotiations carried out at this level of society carry important consequences for shaping, solidifying, and contesting the larger sociopolitical order. This paper examines the formation of intermediate groups at the ancient Maya site of Ceibal, Guatemala, by focusing on evidence from five minor temple complexes in outlying areas of the site. During the Late and Terminal Preclassic periods (ca. 350 BC–AD 300), minor temples were constructed at regular intervals around Ceibal's epicenter. At the same time, and in contrast to previous periods, ritual practices at all levels of society, including those carried out at the minor temples, became remarkably similar. Drawing from proxemics and analyzing spatial patterns in the city, I argue these temples constituted important "semi-public" spaces for local populations. Rituals in these venues provided occasions for participants to share common experiences and negotiate their differences and helped foster local community identities. At the same time, ritual practices at all social scales informed, structured, and reinforced one another, helping to integrate different communities into a larger society.

Burham, Melissa [26] see Palomo Mijangos, Juan Manuel

Burke, Chrissina [20] see Beller, Jason  
Burke, Chrissina [20] see Hodapp, Magen

**Burks, Jarrod (Ohio Valley Archaeology Inc.)**  
[137]  
*Discussant*

Burks, Jarrod [94] see Snider, Joseph

**Burnett, Paul (SWCA Environmental Consultants) and Jonathan Libbon (SWCA Environmental Consultants)**  
[113]

*Archaeological Spatial Patterning in Northern Ohio*

Spatial patterning of archaeological resources is commonly discussed in regional summaries of prehistory; however, the basis for these interpretations can be based on a limited number of sites and researcher experience, which can result in interpretations that are not necessarily grounded in replicable studies. Taking a different approach, we researched a sample of nearly 13,000 archaeological resources from four physiographic regions in northern Ohio: Lake Plains, Till Plains, Glaciated Allegheny Plateau,

and Unglaciaded Allegheny Plateau. Looking at archaeological occurrences from the Paleoindian to Protohistoric time periods, we identify trends in archaeological site placement using statistical correlations between archaeological sites and environmental parameters. Archaeological resources tend to be strongly correlated with elevation, topographic roughness, distance to waterbodies, and distance to stream confluences. Other significant correlations were found between sites and height above surroundings, slope, aspect, and distance to streams. Building from these correlations, we produced a series of probability models and associated maps that depict the relative likelihood of site occurrence. The result is a comprehensive, replicable summary of trends in site location through time across northern Ohio.

Burns, Chuck [56] see Esdale, Julie

**Burström, Mats (Stockholm University)**

[50]

*Lasting Marks of Ship Ballast*

[WITHDRAWN]

Burt, Chadwick [175] see Walker, William

**Burt, Amanda (Indiana University)**

[30]

*Stable Isotope Analysis of Canid Teeth from the Angel Site (12Vg1)*

This paper presents isotopic (oxygen and carbon) data collected from the enamel of canid teeth recovered from the Angel site (12Vg1). The Angel site is the location of a precontact town in southern Indiana on the Ohio River. The town has features representative of other Middle Mississippian sites including mound features, location on a major waterway, and evidence of a socially stratified townscape. Archaeological investigations have shown that this site was an important place for trade and an influential cultural center. Carbon and oxygen isotopic data from Angel site domestic dogs contributes to anthropological questions regarding provisioning practices and mobility among Middle Mississippian peoples and their canine companions.

Busacca, Gesualdo [155] see Schotsmans, Eline

**Bush, Dominic (East Carolina University)**

[168]

*Peril in Paradise: An Interdisciplinary Approach to the Management of Submerged World War II Plane Wrecks in Hawaii*

The Hawaiian Islands played an enormous role in readying US service members for the Pacific Theater of World War II. However, during the war, over 1,000 planes wrecked in Hawaiian waters, many of which were the result of training accidents. Today, these wrecks are a major component of Hawaii's underwater cultural heritage and are valued by a wide array of stakeholders. Due to this cultural and historical significance, understanding the decay trajectories has become an important issue in the realm of archaeology and cultural heritage management. While corrosion is often considered by site managers, there has been little work done on how a site's microbiome may accelerate deterioration, particularly as it relates to submerged historic aircraft. This paper presents a look at the current inventory of World War II aircraft wrecks in the main eight Hawaiian Islands, and how, for the first time, DNA sequencing is being used to discern issues of microbiologically influenced corrosion that face these sites. Four case studies are presented, which represent the first project to collect biofilm samples directly from World War II aircraft. Foundational in nature, this paper is intended to serve as a baseline and blueprint for future follow-up projects.

**Bush, Mark (Florida Institute of Technology)**

[151]

*New Questions from Maturing Studies in South American Paleocology*

[WITHDRAWN]

**Bustos, David (National Park Service), Matthew Bennett (Institute for Studies in Landscapes and Human Evolution), Daniel Odess (National Park Service), Thomas Urban (Cornell University) and Mark Isley (National Park Service)**

[184]

*Developing an Early Warning System for the Effects of Increased Global Warming on Cultural Resources at White Sands National Park*

In recent years, one of the largest concentrations of fossil footprints of late Pleistocene age megafauna and human has been found at White Sands National Park. Over the last 60 years large-scale soil erosion has occurred; in some places, up to 0.5 m in sediment has been removed, both exposing and erasing thousands of prints before they could be documented. The park, with the help of several partners, is racing to document the fossil prints before they are lost, identify areas of greatest erosion, and develop a long-term monitoring system that will provide an early warning for areas of sediment and fossil print loss. A holistic approach has been used to reach these goals, combining various methodologies across a range of scientific fields.

Bustos, David [184] see Bennett, Matthew

Bustos, David [184] see Holliday, Vance

Bustos, David [184] see Odess, Daniel  
 Bustos, David [184] see Urban, Thomas

**Butler, Amanda (Minnesota State University, Moorhead)**

[15]

*Mississippian Missionaries: Bundling a Cahokian Religious Movement*

There is an established history of archaeologists grappling with the how of Cahokia's rise and religiously influenced expansion. Drawing from Indigenous philosophies and New Materialisms, I use the bundle and bundling concept to hypothesize that the establishment and dissemination of a Cahokia-Mississippian religion is best understood as a bundled mission comprised of missionaries (human and other-than-human), places, things, and substances relationally and co-generating a religious movement. In this paper, I trace the possible origins of the bundle contents (mounds/plazas, feasting, cosmic alignments, and special architectures) and the concept of missionizing itself. I review Cahokia's mission foundations with the tethering of cosmic forces with earthly powers in the construction of the core of Cahokia—Monks Mound, the Grand Plaza, the Rattlesnake Complex, and sub-mound 72. At or just before 1050 CE, the Cahokia mission bundle traveled. This outward movement was a religious one, directly and yet differentially impacting local experiences, entangling them all within a larger religious landscape.

**Butler, Don (University of Alaska, Fairbanks)**

[28]

*Diversity in Proto-Athapaskan Land Use off the West Coast of Hudson Bay, Subarctic Nunavut*

From roughly 2600 to 300 BP, the Taltheilei people of Subarctic Nunavut tracked the Beverly and Qamanirjuaq caribou herds throughout tundra and forest landscapes. Their tundra-based sites are typically interpreted as short-lived summer camps. However, the discovery of three unique pit-house sites on the shores of Maguse Lake provides fresh insight into land use diversity. Evidence documented at the Ikirahak site provides support for the hypothesis that some groups were using tundra habitats beyond the brief summer months. The site is comprised of 10 pit-house dwellings, four of which were excavated. Terraced platforms along their internal perimeters are a design element suitable for cold season use. The recovered faunal assemblage is dominated by caribou remains. A large fraction of the assemblage is highly fragmented and calcined, which is consistent with heavy processing and the use of bone as an alternative fuel source. Phytolith assemblages from hearth contexts are dominated by dicot morphotypes yet lack grasses. Together, these fuels are suggestive of occupations after snowfall. Patterns of lithic debris and geochemical signatures are suggestive of dwelling maintenance. These findings reflect longer tundra occupations during the onset of winter, likely with the aim of intercepting a coastal sub-set of the Qamanirjuaq herd.

**Buzon, Michele (Purdue University) and Kari Guilbault (Purdue University)**

[193]

*Exploring Intersectional Identities and Geographic Origins at Tombos, Nubia*

As part of an intersectional investigation of changes in identity and lifeways during sociopolitical changes in the ancient Nile Valley, strontium isotope analysis has provided a useful entry for understanding local practices. At the site of Tombos, human residential mobility was spurred through Egyptian imperial actions in Nubia during the New Kingdom period (~1450–1050 BCE). During this period, immigrants and locals interacted and influenced cultural symbols displayed in burials with migration ending with Egyptian occupation. Through the examination of multiple overlapping identities and experiences, patterns emerge. Isotopically identified locals are exclusive in tumulus graves and flexed body position consistent with the surrounding region. Individuals who were skeletally sexed as female are more commonly local. However, locals also used materials and practices associated with the colonizers, including pyramid, chapel and chamber tomb types, extended body position, and coffins. These variations provide evidence of simultaneous experiences of multiple social statuses at Tombos, with very few differences in markers of overall health and longevity. These findings provide fruitful avenues to explore motivations for varying identity expression related to such ideas as family traditions, religious beliefs, gender dynamics, deliberate signaling, and the concept of foreignness.

Byerly, Ryan [60] see Egeland, Charles

Bynoe, Rachel [90] see Leader, George

**Byram, Scott**

[45]

*Lightening Archaeology's Footprint: Archival and Ground-Penetrating Radar Survey on the California Coast*

Kent Lightfoot's scholarship has enhanced both archaeological investigations and the preservation of cultural sites in California. His collaborations in these endeavors over the past decade include researching high-resolution US Coast Survey topographic manuscript maps depicting archaeological landscapes as they appeared over 150 years ago, and ground-penetrating radar (GPR) characterization of features and stratigraphy at numerous sites. From the rediscovery of the Lone Woman's Cave on San Nicholas Island and several shell mound sites to characterizing mission-era adobe foundations and Native and Russian sites with GPR, these techniques allow archaeologists to focus on informative features at key sites while emphasizing long-term site preservation.

**Byrd, Brian (Far Western) and Monica Arellano (Muwekma Ohlone Indian Tribe of the San Francisco Bay)****[196]***Community-based Archaeology at Sii Túupentak in the San Francisco Bay Area: Integrated Perspectives on Collaborative Research at a Major Native American Settlement*

Collaborative research between Native American tribes and archaeologists has increased in recent years. We present an example of a collaborative archaeological study in the San Francisco Bay Area by the Muwekma Ohlone Tribal leadership and a team of archaeological researchers led by Far Western. The talk describes the nature and breadth of this collaborative effort, highlighting the tribe's initiative in addressing ancestral remains and funerary regalia, as well as their perspective on overall project goals. This includes consideration of the questions being asked of the archaeological record, how these interests and goals were operationalized within the context of a compliance-driven development project, and how the results are contextualized to the broader community. The talk also summarizes novel project insights, with particular emphasis on the lifeways of Sii Túupentak's ancestral Ohlone inhabitants during the four centuries prior to forced relocation by Spanish colonists in 1805. This discussion touches on the nature of economic adaptations, health, sociopolitical organization, and trade in the region just prior to and during Spanish colonization. We conclude with a reconsideration of the project in terms of lessons learned, what to build on, and what we might consider doing differently in the future.

Byrd, Brian [18] see Tushingam, Shannon

Bythell, Abigail [193] see Juengst, Sara

Cabello, Gloria [155] see Sepúlveda, Marcela

**Cabrera, Kevin and Katherine Miller Wolf (University of West Florida)****[69]***A Case Study Examining the Markers of Gender Identity among the Ancient Copan Maya*

Sex and gender are entities that link social interactions of the individual to their lived experience within their society. Bioarchaeologists must continue to critically engage with sex and gender in their examinations of these biological and cultural components of social presentations. This research focuses on bioarchaeological skeletal data from Copan's Late Classic period (AD 600–822) to theorize what gender manifestations can be observed in light of Geller's socio-sexual lives research. Additionally, the presentation of ancient Maya bodies in iconographic contexts would be considered within a cognitive archaeological framework.

Cadwallader, Lauren [189] see Santana Quispe, Lady

**Cagney, Erin****[12]***Correcting the Record: The Legacy of Betty Veatch*

After a rejection from the PhD program at American University in the 1970s, Betty Veatch set out on her own to complete what she called a DIY PhD. Driven by a sense of duty and curiosity, Veatch committed the remaining decades of her life to discovering and recording the archaeology of the Potomac Creek estuary in Virginia. An untimely death in 2006 prevented her from properly finishing her work, leaving the thousands of artifacts she recovered vulnerable to loss and neglect. Until the rediscovery of the collection in 2017, Veatch's life's work, including approximately 90 surveys and the discovery of at least 50 sites, was completely unknown in the Mid-Atlantic archaeology community. Over the last several years, the collection has been rehabilitated by archaeologists and volunteers, ultimately concluding with the identification of 21 new archaeology sites and the addition of site data at two existing sites. Rehabilitating the collection became unexpectedly personal as the work became as much about recovering the archaeological data as about getting to know Betty Veatch through her journals. This paper will explore the personal side of legacy collection work and the complex effects of exclusion on the archaeology record.

**Cai, Yan (University of Pittsburgh)****[168]***The Role of Productive Differentiation in the Development of Social Complexity in Palau*

This paper evaluates a set of hypothetical relationships between agricultural productivity and intensification, local community structure, local-scale productive differentiation and economic interdependence and how they shape social trajectories of early complex society development in the Pacific Islands. In order to evaluate the hypothesis, (1) the paper reconstructed the regional demographic pattern (including population estimation and change, regional and local community structure, population centralization) on Babeldaob Island, Palau, from many years of CRM survey database. (2) The paper also investigates the relationship between demographic distribution and the agricultural productivity and evaluates to what extent the distribution of environmental resources determine the population distribution. The paper also discusses how the modes of agricultural intensification shape social relations in Palau. (3) Finally, the paper investigates the extent and nature of local-scale productive differentiation and simultaneously assesses the extent of inter-household differences in prestige and wealth. The multiple lines of evidence from Palau trajectories established that the set of hypothetical relationships held true in Palau and other Pacific island societies. They are worth further evaluation against systematic empirical data.

Cail, Cheryl [196] see Dillian, Carolyn

**Cain, Chet (Independent)****[6]***Discussant***Cajigas, Rachel (University of Alabama) and Elliot Blair (University of Alabama)****[65]***AMS <sup>14</sup>C Dates as a Proxy for Shell Ring Construction on Creighton Island, GA*

Back-barrier environments are key physiographic areas in the understanding of past relationships between sea level change, human settlement, and resource procurement. New AMS <sup>14</sup>C data collected from one of the only Late Archaic Shell Ring sites in a non-deltaic back-barrier environment has the potential to characterize localized responses to sea level change and better understand construction of these monumental sites. The oyster shell samples dated for this study were collected from a single column that spans the entirety of the 2 m shell deposit of the A. Busch Krick Shell Ring (9MC87, Creighton Island, GA). These dates represent the span of construction and use of the shell ring, providing information about discard practices, postdepositional integrity, and whether shell layers accumulated gradually or were deposited all at once. This research aims to characterize the construction and abandonment of the A. Busch Krick Shell Ring site using high-precision AMS <sup>14</sup>C dating, and articulate these data to Late Archaic sea level change and subsequent site abandonments.

Caldarola, Marine [198] see Schulting, Rick

**Calla Maldonado, Sergio (Universidad Mayor de San Andrés), José Capriles (Pennsylvania State University), Marcos Michel López (Universidad Mayor de San Andrés), Hortensia Nina Vargas (Universidad Mayor de San Andrés) and Katherine Bullain Miranda (Universidad Mayor de San Andrés)****[124]***An Entrance to the Lowlands or to the Highlands? Recent Archaeological Research from Rurrenabaque, Bolivia*

The tropical foothills to the east of the Andes are highly diverse ecological regions that mediated the contact and interaction between highland and tropical societies. The Beni River is one of the main tributaries of the Amazon basin and it was one of the corridors between the highlands, the Yungas montane forests, and the Llanos de Moxos floodplains. Recent excavations in the Zanjón stream, currently part of Villa Lurdes in the town of Rurrenabaque, reveal a settlement with funerary areas and residential sectors in the alluvial terrace of this tributary of the Beni River. Artifactual analysis revealed incised and painted ceramic styles, which are also found in other sites and six radiocarbon dates verify the Zanjón ravine was intermittently occupied between 2,000 and 500 years ago. This area is valuable for archaeological information in relation to the economy, subsistence, regional exchange of goods, technology, and ideology of the societies that developed and interacted with both Andean and Amazonian societies over time.

Calla Maldonado, Sergio [120] see Capriles, José

Calla Maldonado, Sergio [122] see Salame, María

Calvin, Victoria [159] see Boutin, Alexis

**Cameron, Asa (Yale University)****[43]***Discussant***Cameron, Catherine (University of Colorado)****[25]***Predatory Landscapes and Settlement Patterns: Using Ethnohistoric Data to Interpret the Past*

Warfare and slave raiding have been practiced worldwide and through time but became especially prevalent during European colonization. Warfare in Africa provided slaves for the New World; Indigenous people in the New World were hunted down and enslaved for their labor. Wherever warfare and slave raiding became common, they transformed settlement patterns and landscape use. Victims moved to remote areas. They joined others creating safety in numbers and formed larger and often defensively constructed and sited settlements. Some larger communities were multiethnic and the melding of diverse groups created new identities. This paper examines ethnohistoric accounts of the effects of slave raiding on landscapes to develop expectations for "predatory landscapes" that archaeologists can apply to the past. I explore archaeological examples from the New World of depopulation, remote settlements, "no man's lands," multiethnic communities, defensive settlements, and evidence of warfare and assess the degree to which they fit the pattern of predatory landscapes that were common during the colonial era. I offer a new understanding of the changes in prehistoric settlement patterns that sometimes seem idiosyncratic and are often explained as the result of environmental or climatic change.

**Cameron, Catherine (University of Colorado)****[25]***Chair*

Campana, Douglas [23] see Crabtree, Pam

**Campbell, Janice, Prentice Thomas (Prentice Thomas & Associates Inc.), Aemie Nash (Prentice Thomas & Associates Inc.), Charles Thomas (Prentice Thomas & Associates Inc.) and Shannon Brannon (Prentice Thomas & Associates Inc.)**  
[24]

*Understanding Prehistoric Settlement across the Eglin Divide 35 Sites at a Time*

In July 2018, Argonne National Laboratory awarded Prentice Thomas & Associates Inc. a contract for Phase II test and evaluation investigations at 35 archaeological sites on Eglin Air Force Base. The sites, which were selected by cultural resources staff on base under Civil Engineering Installation Management Environmental Assets, were scheduled for Phase II under the base's obligation as a federal agency to complete the test and evaluation process. The sites hosted diagnostics from the Late Paleoindian and Early Archaic eras to the regional Mississippian expression of Fort Walton/Pensacola culture. Environmentally, the sites were distributed across three watersheds separated by the Eglin divide, which a major fluvial divide between the Yellow and East Bay River watersheds, as well as the Shoal/Titi and Turkey Creek/Rocky Creek catchments, with Turkey and Rocky Creeks being part of the Choctawhatchee Bay watershed. The Eglin Divide is conceptually important to an understanding of the archaeological record because of the unusual nature of watersheds. The integration of geological study with the archaeological investigation gathered an impressive array of comparative data on contemporaneous settlement dynamics within the varying environments. This poster highlights some important findings and advances in settlement study of northwest Florida.

Campbell, Janice [4] see Thomas, Prentice

**Campbell, Wade (Boston University)**

[122]

*The Development and Influence of Navajo Pastoralism in the (Peri)Colonial US Southwest*

The rise of a pastoral tradition among early Diné (Navajo) communities in the American Southwest circa AD 1700 represents an important turn in the history of the region. Recent work including an ethnoarchaeological study of contemporary Diné herding practices and a systematic study of Gobernador Phase (AD 1626–1776) Navajo sites in Dinétah, the traditional Navajo homeland in northwest New Mexico, provide new data with which to begin to evaluate early Navajo shepherding practices. This talk will discuss how archaeological studies can help to shed light on the dynamic history of Navajo shepherding and its continued importance to the twenty-first-century Diné community.

Campos, Cinthya [177] see de Anda, Guillermo

Campos, Estefany [29] see Tavera Medina, Ana Carito

Cannon, Kenneth [196] see Phillips, Amy

Canterbury, J. Alex [53] see Wright, Lori

**Canuto, Marcello (M.A.R.I./Tulane University) and Sarah Van Oss (Tulane University)**

[188]

*In Their Copious Space Time: Considering Wendy Ashmore's Principles of Settlement Pattern Analysis, Past and Present*

Wendy Ashmore's contribution to Maya archaeology is as delightfully varied as it is enduring. Her seminal work on lowland Maya settlement patterns helped galvanize a generation of research on the socioeconomic integration of lowland Maya society. Wendy's 1981 assertion: "Settlement patterns are spatial distributions of features, studied at a number of scales, from individual features through occupation patterns over a wide area, such as the Maya lowlands" neatly isolated the two foundational variables relevant to spatial analysis in settlement pattern research: the feature to be identified and the scale at which spatial relationships were to be measured. While the feature is a category (activity area, structure, patio, etc.) of constrained variability, scale is a continuous variable that has remained entirely undefined and arbitrary, limiting the compatibility and comparability of settlement pattern analyses. In this paper, we hope to pull on this one research thread of her career by demonstrating how lidar-derived settlement data can be used to empirically define scales of analysis in order to identify and compare neighborhood, city, and regional patterns across the Maya lowlands. In this way, we can vault over historically obdurate methodological limitations to address questions of multiscale social integration of lowland Maya society.

**Canuto, Marcello (M.A.R.I./Tulane University)**

[54]

*Discussant*

Canuto, Marcello [11] see Auld-Thomas, Luke

Canuto, Marcello [153] see Barrientos, Tomas

Canuto, Marcello [218] see Ponce, Jocelyne

**Cap, Bernadette (San Antonio Museum of Art), Jason Yaeger (University of Texas at San Antonio), Tiffany Lindley (Alamo Trust Inc.), Katharine Stephens (University of California, Riverside) and David Keim (University of Leicester)**

**[54]**

*Access and Equity in the Classic Maya Xunantunich, Belize, Marketplace*

Marketplaces among the Classic period (AD 250–900) Maya functioned to meet household needs for goods such as ceramics, stone tools, and organic goods. Despite the widespread availability of these goods, wealth differences shaped household consumption practices. In this paper we compare the Gini index of two hinterland neighborhoods within the Xunantunich, Belize, polity to discuss equity in relation to the marketplace located at Xunantunich. We examine obsidian blades because the marketplace likely was the primary source to obtain them and they are common and ubiquitous in domestic assemblages. This study highlights the ways in which combining traditional artifact analysis and measures like the Gini index help us better examine questions of equity in the past.

**Capriles, José (Pennsylvania State University), Sergio Calla Maldonado (Universidad Mayor de San Andrés) and Calogero Santoro (Universidad de Tarapacá)**

**[120]**

*Human Adaptive Radiation and the Peopling of South America*

South America was the last continent on earth colonized by humans. The latitudinal and elevational gradients of this vast continent contain a wide array of environments that have influenced various dispersion processes. Here, we rely on adaptive radiation, a theory developed as a macro-evolutionary approach for explaining the rapid diversification of organisms undergoing direct selective pressures, to explain the human colonization of South America. Adaptive radiation is triggered by several factors including the ecological opportunity offered when new resources emerge, the extinction of a species previously using these resources, the colonization of an area in which resources were previously unused and/or the evolution of a trait or key innovation that permits the utilization of resources in ways not previously possible. We review the archaeological record of South America to identify how most if not all these factors contributed to the development of diverging adaptive strategies and enhanced swift human dispersion across this continent.

**Capriles, José (Pennsylvania State University)**

**[6]**

*Discussant*

Capriles, José [124] see Calla Maldonado, Sergio

Capriles, José [122] see Salame, María

Capriles, José [10] see Tripcevich, Nicholas

**Caramanica, Ari**

**[88]**

*Reexamining Small-Scale El Niño Event–Based Farming on the North Coast of Peru*

The El Niño phenomenon is infamous for resulting in mega-flood events along the coast of Peru; however, archaeological evidence suggests that moderate and possibly even minor El Niño events were also utilized and incorporated into agricultural systems. The Pampa de Mocan farming landscape demonstrates that these systems involved landscape-scale infrastructure, but also depended on the strategic and seasonal movement of farming populations. A useful model of farming population circulation around seasonal drought and irregular rainfall is drawn from Turkana agropastoralists. This paper seeks to reexamine ENSO-agro-systems on the north coast of Peru through the lens of east-African monsoon-based agropastoralism. Applying this lens to prehispanic farming landscapes results in new insights into prehispanic resilience and the use of ephemeral and intermittent streams.

Caramanica, Ari [115] see Feltz, William

Caramanica, Ari [148] see FitzPatrick, Mackinley

**Carballo, David (Boston University)**

**[13]**

*Governance, Urbanism, and Collective Action in Prehispanic Central Mexico*

Among the polities of prehispanic central Mexico, the Aztec Empire was the largest and governance strategies within it are the best understood, due to its chronicling in Spanish and Nahuatl texts following the Aztec-Spanish war and transformation into the core of colonial New Spain. Yet contemporary central Mexican polities, some of which were active agents in the dismantling of the Mexica-Aztec system, and predecessors in the region exhibit wide variability in governing strategies over time and space. Common themes in governance drew on certain ecological realities and shared ontologies of religion and cosmovision. Points of divergence can be seen in the particular entanglements between political economies and the settings and scales of collective action within urban state capitals. In this paper, I review how governance varied diachronically across these axes in relation to fiscal financing, common-pool resource issues, public goods allocation, urban infrastructure, ritual practices, and the legitimation of rulership.

Carballo, David [163] see Carballo, Jennifer

**Carballo, Jennifer (Harvard University, Peabody Museum) and David Carballo (Boston University)****[163]***A Deep History of Central Mexican Pottery: Daily Life and Diachronic Patterns*

For decades of his diverse research, George Cowgill examined the relationships between the spatial distributions and temporal change in the ceramics of Teotihuacan with patterns of urban organization. He often focused on macroscale issues—such as demographics, economics, and social inequality—but never lost sight of how these were realized through smaller-scale decisions of individuals and households as they navigated daily life. In this paper we offer our perspectives on major changes in central Mexican ceramics over three millennia of the prehispanic sequence, before, during, and after Teotihuacan. We examine significant changes during the Formative period in stylistic communication and the shift from ceramics more as prestige goods to utilitarian goods, the changes in specialized production and scalar economies introduced at Teotihuacan, greater commercialization associated with the Postclassic period, and shifts in food production and service practices throughout the sequence.

Carcedo, Paloma [29] see Shimada, Izumi

Carden, Megan [19] see Van Meter, Nicole

Cárdenes Sandí, Guaria [125] see López Rojas, María

**Cardinal, James (New York State Museum) and Jennifer Loughmiller-Cardinal (University at Albany, State University of New York)****[60]***Behavior, Belief, and Bayes: The Hidden Links between Artifacts and Social Norms*

The eventual goal of high-level archaeological interpretation is to discern patterns of social behavior from patterns of material artifacts—to derive cultures from things. Implicit in that goal is understanding the relationships between socially embedded actions and beliefs. Those relations promote the patterns that we recognize as cultural expressions and the social norms that they reflect. Contemporary approaches to archaeological theory and materiality, however, privilege the latent cultural beliefs over their empirical expressions without a clear conceptual bridge between the two. This promotes an unfortunate “toolkit” or “bricolage” mentality in the application of theoretical constructs to the interpretation of the empirical archaeological record. If we believe the material record to reflect socially embedded behavior, then both social theory and its materiality should coincide as a unified conceptual model. A feasible bridge can be found by examining the Bayesian basis of social cognition as it relates to the application of social norms through material behavior. The underlying process of human cognition itself obviates the need to distinguish social and material theories by showing how social norms and resultant material behavior are equivalent outcomes.

Caric, Mario [193] see Toyne, Jennifer Marla

**Carlson, Kristen (KC) (Augustana University)****[179]***The Intersection of Sustainability, Southwestern Archaeology, Native American Interests, and Tourism*

In addition to a brief summary of an archaeological survey, this talk focuses on the intersection of archaeological analysis, southwest tourism, and local Indigenous interests. Just prior to the pandemic shut down of Navajo Nation, and much of the world, a crew of volunteer students and I carried out a survey on Navajo Nation in the southwest for the benefit of a local Dine' (Navajo) family to enable the future growth of their bed and breakfast outside Grand Canyon National Park. This talk focuses more broadly on the bigger picture of sustainability and living peoples in a region where archaeology is a tourist attraction and a precious resource.

**Carlson, Kristen (KC) (Augustana University)****[179]***Chair***Carpenter, John (Centro INAH Sonora), Matthew Pailles (University of Oklahoma) and Guadalupe Sánchez (Centro INAH Sonora)****[86]***Confronting the Mogollon Monster: A Perspective from Northwest Mexico*

In this paper, we address the concept of Mogollon Culture from the perspective of Northwest Mexico, examining various regional traditions primarily based on current linguistic models and broad ceramic styles and architectural traits and additional shared cultural traits. We propose an extensive Taracahitan linguistic continuum that ranged from La Quemada, Zacatecas, to Casas Grandes, Chihuahua, additionally incorporating the Loma San Gabriel predominantly associated with Durango, and the Xixime and Acaxee of the bordering highlands of Sinaloa and Raramuri (Tarahumara) of southern and central Chihuahua. The Río Sonora and Serrana archaeological traditions also comprise part of this linguistic continuum. Archaeologically, these various groups represent Sierra Madrean adaptations within Sonora and Sinaloa, with early pit-houses consisting of stone alignments, occasionally grouped within room blocks or cliff dwellings and with a preponderance of textured brown wares and red wares. We also identify the Ópata as representing cultural continuity with the Río Sonora archaeological tradition, whose geographic distribution approximates that of the historically defined Opataría.

Carpenter, John [176] see Davidson, Jaron  
 Carpenter, John [176] see Krug, Andrew  
 Carpenter, John [176] see Larrick, Dakota  
 Carpenter, John [176] see López Rivera, José Antonio  
 Carpenter, John [176] see Pailes, Matthew

**Carpenter, Lacey (Hamilton College)**

[123]

*Destruction, Reconstruction, and Revisiting: A Chronology of Place-Making in the Civic-Ceremonial Core of El Mogote, Oaxaca, Mexico*

The development and growth of monumental spaces such as civic-ceremonial plazas inform our understanding of the simultaneous processes of communal place-making and legitimizing of authority and hierarchy. While these spaces are highly visible and seemingly permanent, they often have dynamic episodes of change in terms of their use, layout, and appearance. The site of El Mogote in the Valley of Oaxaca, Mexico has at its core a 2.2 ha civic-ceremonial plaza. Previous research indicates that the plaza and adjacent mound complexes were constructed and used over the course of almost five centuries. New data from Area M, an elite residence east of the plaza, revealed a series of structures and activity areas that indicate the area underwent episodes of destruction, reconstruction, and repurposing. Bayesian analysis of new radiocarbon dates from the structures and features uncovered in Area M help establish a chronology for this area and clarify the timing and tempo of the activities through which people made and remade this place. These analyses also help establish the relationship between the Area M complex and other excavated structures on the civic-ceremonial plaza to further our understanding of a period of growth and increasing sociopolitical hierarchy at the site.

Carpenter, Lacey [71] see Arnold, Elizabeth  
 Carpenter, Lacey [71] see Leahey, Aidan  
 Carpenter, Lacey [38] see Roselli, Isabella  
 Carpenter, Lacey [71] see Subramaniam, Nandini  
 Carpenter, Lacey [69] see Walker, Emily

**Carpenter, Michelle (University of Texas at San Antonio), Robert Hard (University of Texas at San Antonio), James Watson (University of Arizona), Elisa Villalpando (Instituto Nacional de Antropología e Historia) and Raymond Mauldin (University of Texas at San Antonio)**

[198]

*Stable Isotope Analysis of the Early Agriculture Period at La Playa (SON:F:10:3) Sonora, Mexico*

[WITHDRAWN]

**Carpiaux, Natalie (University of Wisconsin–Milwaukee)**

[227]

*Oneota Ceramics at Sites around the Lake Winnebago Area*

Excavations by the University of Wisconsin–Milwaukee Cultural Resource Management in recent years have resulted in Oneota materials from numerous sites in Northeastern Wisconsin. While many of the ceramics are often typed as, or fit the definition of Winnebago Focus ceramics, some other types such as Grand River or Carcajou have been identified. This paper looks at some of the ceramics from various sites around Lake Winnebago. The goal is to determine variability between sites in regard to the types and attributes noted during analysis, and how this may contribute to our understanding of Oneota in the Lake Winnebago Area.

**Carpio, Edgar**

[199]

*Análisis comparativo de puntas de flecha en varios sitios del área maya*

Esta ponencia es el resultado del estudio comparativo de diferentes muestras de puntas de flecha provenientes de los sitios Las Margaritas, Mixco Viejo y el área central de Escuintla, Guatemala. Se propone que tales artefactos tuvieron una gran difusión en el período posclásico por el incremento de la actividad militarista y que cada grupo le imprimió características particulares.

Carr, Christopher [104] see Brewer, Jeffrey

**Carr, Philip (University of South Alabama)**

[159]

*Team-based Learning and The Fifth Beginning: Reinvigorating Introduction to Archaeology*

Enrollment in introductory archaeology courses varies across universities, and at the University of South Alabama, it has lower enrollment than other courses which fulfill a social science general education requirement, including introduction to cultural anthropology. One solution available to all who teach such introductory archaeology courses involves demonstrating the value of such a course. Here, combining a particular pedagogy, Team-Based Learning (TBL), with an inexpensive, nontraditional textbook is offered as a solution. Students find forming permanent teams, flipping the classroom, a specific sequence of individual work and teamwork, and immediate feedback from TBL engaging. The textbook, *The Fifth Beginning*, asks the question, what can six million years of human history tell us about our future? To use TBL and *The Fifth Beginning* in combination requires a nontraditional

approach both in the classroom and outside it, with significant use of the university learning management system. The investment of time and effort is rewarded through high-levels of student participation and performance.

Carre, Matthieu [22] see Gruver, Steph

Carril, Dennis [207] see Baisden, Rebecca

**Carroll, Amber (Kutztown University), Tyler Roberts (Kutztown University) and Khori Newlander (Kutztown University) [39]**

*Building a Recipe Book of Historic Pottery Using Portable X-Ray Fluorescence Spectrometry*

Archaeologists often infer socioeconomic organization and regional interactions by sourcing artifacts back to their point of origin (e.g., a quarry or other place of manufacture). Tracing the movement of artifacts and raw materials across the landscape allows archaeologists to define links between different places and people. A fundamental challenge in sourcing pot sherds is that many potteries produced pottery that looks alike. Relying on maker's marks to determine the potteries represented by an assemblage at an historic site is a useful way to begin to establish regional connections; however, most pot sherds do not possess maker's marks. Absent maker's marks, visual attributes are often insufficient for determining where the pottery was manufactured. Here, we employ portable X-ray fluorescence spectrometry (pXRF) to acquire compositional data that allow us to build a "recipe book" of the potteries represented at Stoddartsville, a nineteenth-century milling village in northeast Pennsylvania. These "recipes" expand our ability to source pottery from the site, providing insight into the regional economy, the development of local ceramic industries, and consumer agency.

Carroll, Amber [39] see Roberts, Tyler

**Carroll, Peyton (University of Cambridge), John Murray (School of Human Evolution and Social Change), Miles Martin (School of Human Evolution and Social Change) and Curtis Marean (School of Human Evolution and Social Change) [90]**

*Comparing Piece-Plotted and Sieved Stone Artifacts from Pinnacle Point 5-6*

Archaeological fieldwork is a time-consuming and destructive process. Thus, the primary goal of excavation is to meticulously document as much information about the site and artifacts as possible. In Paleolithic archaeology, it is common for archaeologists to use a total station to record the spatial location of artifacts (i.e., piece-plotting) and employ a post-excavation sieving protocol for small finds that were not plotted during excavation. A significant amount of work is invested in finding, cleaning, and analyzing these small artifacts. In this research, we investigate whether there are biases in artifact assemblages that were piece-plotted in situ and those found within the small finds at the Middle Stone Age site, Pinnacle Point 5-6, on the coast of South Africa. We analyzed artifacts found in the 10 mm sieve from units dated to the MIS 5 to MIS 4 transition and compared them to the piece-plotted artifacts that correspond to these units. Our goal is to see if there are differences in assemblage composition between the plotted and screened data. These results have implications for archaeological excavation and analysis protocols, particularly regarding small finds.

Cartaciano, Christina [186] see Quintana Morales, Eréndira

Cartajena, Isabel [51] see De Souza, Patricio

**Carter, Alison (University of Oregon) and Miriam Stark (University of Hawai'i, Manoa) [218]**

*Power, Prasat, and Periphery: Understanding Life in Provincial Angkor*

Understanding the degree and geographic reach of state control has long been a challenge to archaeologists who study ancient states and empires. Provincial areas offer key vantage points for studying the limits of state power and also local agency in these regions. The Angkorian civilization was Southeast Asia's dominant regional power from the ninth to fifteenth centuries CE. Its cultural influence extended across much of mainland Southeast Asia by its twelfth-century apex, but little archaeological research has yet concentrated on provincial areas and their long-term relations to the Angkorian core. Archaeological research in one of Angkor's key provinces, Battambang, aims to address these questions through investigating the state temple community of Prasat Baset. Writing Baset's occupational history offers insights on the nature and depth of Angkorian imperial intervention through time, and more generally about strategies of imperial control. This paper presents data from our 2018–2019 field seasons and offers preliminary interpretations regarding the impacts of Angkorian state expansion.

**Carter, Benjamin (Muhlenberg College), Jeff Blackadar (Carleton University) and Weston Conner (Lehigh University) [204]**

*Reassessing Relict Charcoal Hearths Identified in Pennsylvania by Artificial Intelligence and Cluster Analysis*

Recently we published the results of utilizing artificial intelligence (Mask R-CNN) and cluster analysis to identify relict charcoal hearths (RCHs) from the nineteenth century across Pennsylvania. RCHs are the landscape-scale remains of a vast industry that provided the fuel for nineteenth-century iron production. Charcoal production, therefore, provided the underpinning for the industrial revolution. After identifying ca. 50,000 potential hearths in and around State Game Lands (SGL; ca. 28% of PA) in high-resolution

lidar data, cluster analysis helped us reduce the number of false positives. Our assessment indicates that approximately 82% of the 26,873 potential RCHs remaining after the cluster analysis are true positives. Therefore, 18% of the remaining sample are false positives and approximately 1% of true positives are excluded by the cluster analysis. Additionally, our assessment of the cluster analysis focused on a single SGL, potentially ignoring geographic variability that appears to have important impacts. This paper addresses ways in which we have used both field reconnaissance and alternative computational approaches to improve our results.

**Carter-Davis, Cindy**

[134]

*Discussant*

**Carvajal Contreras, Diana**

[125]

*Puerto Hormiga, la Islita del Pozón (Colombia) y el Rasgo Ch, Cerro Juan Díaz (Panamá): Una comparación de concheros del Caribe Colombiano y el Pacífico Panameño*

Los sitios arqueológicos denominados “concheros,” son evidencia de la utilización de diferentes recursos animales y hábitats. En el Caribe colombiano y el Pacífico panameño, aparecen en el holoceno, es decir durante los últimos 8.000 años. Los concheros que se describirán y compararán en esta ponencia, desde la zooarqueología, son dos sitios del Formativo de Colombia, el Pozón, localizado en la Bahía de Cartagena y Puerto Hormiga, en el Canal del Dique, así como el sitio del cerámico tardío de Panamá, Cerro Juan Díaz (el Rasgo Ch). El análisis de los materiales brindó conocimientos sobre los tipos de concheros que pueden existir en esta área del norte de Colombia y la Baja Centroamérica, permitiendo establecer un registro de las especies existentes en la época prehispánica. Los resultados del estudio revelaron que existen diferentes tipos de concheros y hábitats explotados. Esta investigación es de interés no solo para la arqueología en términos de formación de sitios, sino también para documentar una pequeña parte de la historia ambiental del Neotrópico.

**Carvalho, Milena (University of New Mexico, ICArEHB—Universidade do Algarve), João Cascalheira (ICArEHB—Universidade do Algarve) and Nuno Bicho (ICArEHB—Universidade do Algarve)**

[98]

*Human Paleoeology during the Gravettian and Proto-Solutrean in Southwestern Iberia: A Stable Isotope Analysis of Herbivore Teeth from Vale Boi (Portugal)*

The dramatic climatic oscillations of the Late Pleistocene posed significant challenges on Paleolithic humans, resulting in more flexible and resilient human behavioral changes and reorganization of lifeways (sensu Bradtmöller et al. 2012). However, linking climate change to human activity is difficult due to the disparate scales of analysis between environmental proxies and archaeological evidence, and the general dearth of local environmental records in some parts of Europe with shorter research histories. Portugal is one such place where limited archaeological and environmental records mean that relatively little is known about how Paleolithic humans adapted to Late Pleistocene climate change. Here, we present the results of a stable isotope (carbon and oxygen) study of horse and red deer teeth from the Proto-Solutrean and Gravettian deposits of Vale Boi, an Upper Paleolithic multicomponent (rockshelter and open-air) site in southern Portugal with a rich Upper Paleolithic sequence that yielded evidence of highly dynamic subsistence strategies, coastal and inland exploitation, production of lithic and bone tools, as well as adornments and portable art. We use these data to reconstruct the environmental context of Proto-Solutrean and Gravettian occupations at the site and evaluate human responses to climate change during the Upper Paleolithic.

**Casana, Jesse (Dartmouth College) and Madeleine McLeester (Dartmouth College)**

[126]

*The State of the Field: Emerging Approaches to the Archaeology of Agricultural Landscapes*

Twenty-five years ago, Naomi Miller and Katheryn Gleason edited the seminal volume *The Archaeology of Garden and Field*, an authoritative guide to the identification and interpretation of archaeological field systems and other evidence of past agricultural practice inscribed within the landscape. This paper reviews the state of the field today, overviewing a suite of emerging methods that are revolutionizing how archaeologists find ancient field systems, including recent advances in aerial, satellite, and ground-based remote sensing, as well as complementary geochemical and archaeobotanical approaches. This paper situates the critical urgency for archaeological understandings of past agricultural land use practices within contemporary theoretical discourses exploring the entanglements of humans with their environment as well as the transdisciplinary debate surrounding the establishment and definition of the Anthropocene as a geologic epoch. Herein, we argue for the importance of archaeological investigations of fields that prioritize discovery and interpretation of relict fields and their constitution within larger landscapes, both as a means to better understand people in the past as well as our role as a species in shaping global ecosystems.

Casana, Jesse [160] see Alperstein, Jonathan

Casana, Jesse [126] see McCoy, Mark

Casana, Jesse [126] see McLeester, Madeleine

**Cascalheira, João (ICArEHB—University of Algarve), Joana Belmiro (ICArEHB—Universidade do Algarve) and Nuno Bicho (ICArEHB—Universidade do Algarve)**

[98]

*The Last Glacial Maximum at Vale Boi*

Climatic changes that occurred during the Last Glacial Maximum (LGM) had important repercussions in the geography, technology, and social behavior of human populations in Europe. Human range contraction into southern European peninsulas, with subsequent

genetic bottlenecks, are among the most significant implications. In Iberia and southern France transformations also included the occurrence of significant technological changes, mostly marked by the emergence of the diverse set of Solutrean flat-retouched and bifacial stone tools. Located at the crossroads of two rather different ecological and cultural worlds within Iberia (Mediterranean Spain and Portuguese Atlantic), the site of Vale Boi has been a crucial element in understanding the technological, economic, and social traits of the communities that inhabited Southwestern Iberia during the LGM. In this paper we will revisit the most relevant evidence for the Proto-Solutrean and Solutrean occupations at Vale Boi, and their implication for our current understanding of LGM human adaptations in western Europe.

**Cascalheira, João (ICArEHB—University of Algarve)**

[98]

*Chair*

Cascalheira, João [98] see Barbieri, Alvisé  
 Cascalheira, João [98] see Belmiro, Joana  
 Cascalheira, João [98] see Bicho, Nuno  
 Cascalheira, João [98] see Carvalho, Milena  
 Cascalheira, João [98] see Gonçalves, Célia  
 Cascalheira, João [98] see Horta, Pedro  
 Cascalheira, João [98] see Simón-Vallejo, María

**Caseldine, Christopher (Arizona State University)**

[215]

*Least Cost Paths and Movement in Tonto Basin, Central Arizona*

Archaeologists have used increasingly complex models to understand the movement of people in the past. A particularly fruitful method, least cost paths (LCP) analysis, provides insights into travel across a landscape at previously unimaginable scales. Further, factors beyond topography, such as distance to water or socially important locations, can be considered in route formation in previously time-consuming ways. In this paper, I examine travel routes between Tonto Basin in central Arizona and areas elsewhere in Arizona. Using the Tonto Cliff Dwellings as a starting point, I created LCPs to 21 settlements across Arizona. The LCPs, which were calculated for slope, energy expenditure, and time, often created significantly different routes to the same settlement. The paths were then stacked to identify possible major travel routes to and from Tonto Basin. To ground my hypothetical paths within real-world travel, I examine my results through the lens of “landscapes of movement.” Of relevance, the approach highlights the interconnection of landscape, social concerns, and cosmology in path formation and the travel experience. Finally, I offer avenues of future research for assessing the validity of the paths created in this study and provide suggestions for refining the application of LCPs to central Arizona travel studies.

**Caseldine, Christopher (Arizona State University)**

[215]

*Chair*

**Cassidy, Jim (Maritime Museum of San Diego)**

[112]

*Moderator*

[135]

*Discussant*

**Castañeda, Amanda (Wyoming State Historic Preservation Office), Aaron Brien (Apsáalooke Tribal Historic Preservation Officer) and Lawrence Loendorf (Sacred Sites Research Inc.)**

[101]

*Traditions Set in Stone: Exploring Apsáalooke Connections to Rock Art on the Middle Fork of the Powder River*

The Wold Rock Art District consists of four rock art sites along the Middle Fork of the Powder River in Central Wyoming. Recent work conducted by Sacred Sites Research and the Wyoming State Historic Preservation Office focused on a full documentation of the rock art and during these investigations, some of the imagery was recognized for its connection with the Apsáalooke (Crow) culture. In particular, an incised scene at one of the sites depicted a well-known Apsáalooke story of Spring Boy trapped on top of the sun dance lodge after he was captured by an adversary. Here we summarize several additional aspects of the rock art and surrounding landscape that can be strongly associated with Apsáalooke stories and traditions. This includes an identifiable ceremony, ties with vertical series rock art, other Spring Boy and Lodge Boy adventures, and cultural stories associated with the red sandstone cliffs of the Chugwater Formation. This paper highlights the benefits of using oral traditions and Indigenous knowledge for better understanding rock art.

**Castañeda, Amanda (Wyoming State Historic Preservation Office)**

[101]

*Chair*

**Castañón-Suárez, Mijaely (Colegio de Michoacán), Jasinto Robles (INAH-Michoacán), Alejandro Valdés and José Luis Punzo Díaz (INAH-Michoacán)**  
[174]

*Technological Analysis of Ceramics in Tingambato*

This poster presents the first results from typological and technological analyses made of ceramics from Tingambato. The chrono-stratigraphic ceramics sequence is shown in order to identify the different occupational phases in the site. Additionally, the technological traditions of ceramics from the Epiclassic period were characterized by applying a ceramic *chaînes opératoires* analysis. This implies the reconstruction of all the processes for ceramics elaboration in order to identify the small variations found in each phase of the production process, which allows for differentiating among the ceramic traditions from different sites. This method includes the analysis of fingerprints from different production processes and petrographical characterization.

Castañón-Suárez, Mijaely [174] see Sosa Ruiz, Mónica

Castellanos, Jeanette [13] see Foias, Antonia

Castillo, Cristina [181] see Hendrickson, Mitch

**Castillo, Karime (Bowdoin College)**

[77]

*Glass by the Recipe: Glassmaking Technology in Colonial Mexico*

The arrival of glassmaking technology in the Americas during the sixteenth century meant the adaptation of a long-standing tradition of glassmaking to a new environment and a new set of resources. While trying to replicate the Iberian tradition of glassmaking, glass artisans in New Spain had to adapt to the available resources and began to incorporate local raw materials into their raw glass. This has been confirmed by the analysis of the chemical composition of archaeological glass from Mexico. Technical reports from the late colonial period and glass recipes from the early independent period provide us with additional clues on the artisan's choices regarding raw material selection in glassmaking. At the same time, an experimental program on the replication of glass recipes is filling in the missing gaps in the historical documents, providing clues on technological aspects of the process, such as firing temperatures and conditions. This paper presents an overview of the development of glassmaking technology in colonial Mexico as reflected in the archaeological materials and with a focus on the adaptations and technological choices made by the glass artisans in New Spain.

**Castillo, Victor (Jagiellonian University, Poland)**

[49]

*Colonial Highland Maya Dance: Archaeological and Historical Perspectives from the Murals of Chajul, Guatemala*

Influential frameworks explaining the continuity and change of Maya religion in colonial times draw on a division of public and domestic settings for the performance of ritual practice. According to this model, continuity happened in the domestic sphere while change was created in the public realm of Maya communities. The recent findings of colonial-era wall paintings in the highland Maya town of Chajul, Guatemala, problematize these assumptions. These murals were painted in intimate, domestic spaces; however, they depict musicians and dancers wearing costumes of local and European origin engaged in what seems to be public performances. The study of the concrete spaces in which these performances took place, along with historical evidence regarding colonial Maya dance, suggest that there were intermediate-level religious institutions that offered a versatile arena for the performance of dances and dramas to diverse publics of varied sizes with different political agendas. In such flexibility, highland Maya communities found a subtle way to reproduce traditional ritual knowledge and to adapt to religious change imposed by the Spanish colonial order.

Castillo-Lujan, Feren [29] see Torres Morales, Genesis

Cathcart, Chris [88] see Martín, Samuel

**Catlin, Kathryn (Jacksonville State University)**

[142]

*Discussant*

**Cázares Munguía, Irma Lucía**

[73]

*Excavaciones en el Edificio 7, en el contexto de la "Plaza B" de Atzompa*

Por su ubicación central y el complejo contexto arquitectónico que la rodea, la Plaza B del Conjunto Monumental de Atzompa constituye una unidad de análisis arquitectónico y urbanístico en el área más exclusiva del sitio. Ubicada centralmente entre el Edificio 1, la Casa de los Altares, el Edificio Funerario y la Plataforma de transición hacia la Plaza C (Edificio 8), la definición de los aspectos constructivos y la función del Edificio 7 constituía una tarea pendiente para la interpretación integral del espacio monumental. En 2016 se realizaron las primeras exploraciones en este edificio, en esta ponencia se presentan los resultados, tanto de arquitectura como de sus materiales arqueológicos, que nos permiten un acercamiento interpretativo sobre su función.

Celhar, Martina [226] see Zaro, Gregory

**Centi, Laura (Hebrew University of Jerusalem) and Francesco Valletta (Hebrew University of Jerusalem)**  
[191]

*To Err Is Human: Assessing Patterns of Knapping Expertise along Neshar Ramla Upper Sequence (Israel), ca. 120–80 ka BP*  
We report the results of combined lithic traditional and 3D-based analysis applied to track the presence of inexperienced knappers at the Middle Paleolithic open-air site of Neshar Ramla. These methods were also applied to understand whether core assemblage composition (i.e., formal Levallois cores and unformal cores) could have been affected by different degrees of knapping expertise among the site inhabitants. Incipient cones, hinged scars, and cascades, the most frequent material outcome of knapping accidents due to inexperience, are more frequently identified in unformal cores than in Levallois ones, supporting a relation between core types and the degree of experience. In addition, the 3D-based analysis of cores bearing incipient cones allowed us to establish if the failure in blank removal was consequent to a misjudgment in the preparation of a correct angle between striking platform and flaking surface (more likely in unexperienced knappers), or in the execution of the knapping blow (a mistake that expert knappers also occasionally make). The extent, types, and causes of the knapping mistakes have been quantified and compared between different archaeological units, highlighting patterns in the degree of expertise and in group composition over time.

**Cerezo-Román, Jessica (University of Oklahoma), Jessica Thompson (Yale University), Alex Bertacchi (Yale University), Elizabeth Sawchuk (University of Alberta) and Flora Schilt (Universidade do Algarve)**

[26]

*Burning the Dead: Intentional Burning among Later Stone Age Hunters-Gatherers in Northern Malawi*

In this paper, we examine intentional burning in later Stone Age hunters-gatherers, which derives from a mortuary context in the site of Hora 1, Mzimba District, northern Malawi. Using archaeological context and bioarchaeological study of the human remains, we reconstruct the *chaînes opératoires* associated with the context, thermal alterations, and biological profile of a single individual found in a large cemented ashy deposit dating to ca. 9500 cal BP. We situate this individual within the broader mortuary context of the site, dominated by inhumations, to explore different tempos and ways of treating the bodies and if parallel commemorative rituals existed. We have used these data to develop critical perspectives on sensorial experiences and their material manifestations in bodies and burials for ancient hunter-gatherer groups in the region.

**Cerezo-Román, Jessica (University of Oklahoma)**

[26]

*Chair*

**Chacaltana-Cortez, Sofia (Universidad Antonio Ruiz de Montoya)**

[49]

*Beyond the Public and the Private at the Moquegua Valley from the LIP to the Early Colonial Period*

In the social sciences, it is long known that the public versus the private dichotomy is not universal. Like many other dichotomies and exclusionary binaries, it was imposed in the Andes by European colonialism and Enlightenment thought. One of its consequences was the assumption of the subordination of “women” across time and space. Furthermore, Andean historians have argued that this dichotomy did not work for Andean or enslaved African descendant women during the colonial Andes. Many of them worked outside their household or community to keep up with tribute requirements or as servants inside Hispanic households. I look at archaeological sites from three periods (Late Intermediate period, Inca, and colonial) located in the Moquegua Valley of the southern Andes. Using a feminist perspective that rejects the simple division of public and domestic, I show how bodily practices, movement across spaces, and landscape configurations can form and transform communities and power relations.

**Chacaltana-Cortez, Sofia (Universidad Antonio Ruiz de Montoya)**

[217]

*Discussant*

Chacaltana-Cortez, Sofia [84] see Sharratt, Nicola  
Chacaltana-Cortez, Sofia [9] see VanValkenburgh, Parker

**Chagoya Ayala, Itzel (Escuela Nacional de Antropología e Historia)**

[123]

*Vida cotidiana en el Posclásico tardío en Guiengola, Oaxaca: Valor del análisis in situ en el recorrido de superficie*

Los materiales arqueológicos registrados en superficie son evidencia del tipo de relaciones sociales, económicas, religiosas y culturales que tuvieron los zapotecos del Istmo de Tehuantepec en el sitio Guiengola durante las últimas etapas de ocupación en el periodo Posclásico tardío (1300-1521 dC). En esta ponencia, se mostrará el análisis de la cultura material cerámica in situ que se realizó en cuatro grupos de unidades domésticas durante el año 2021 a través del Proyecto Arqueológico Guiengola, análisis que han permitido documentar cómo la población poseyó y utilizó elementos tanto locales como foráneos, exponiendo así un acercamiento a las relaciones entre el Istmo de Tehuantepec, los Valles Centrales de Oaxaca y la región del Soconusco. Aunado a esto, mostraré como estos materiales cerámicos son una muestra directa de las actividades de la vida cotidiana de la población haciendo uso de ellos expondré: (1) cómo fue esa relación interna que evolucionó durante varios años y que logró que varias generaciones fueran habitando una misma área y (2) la división interna de actividades que se realizó en estas unidades, ya que fueron identificadas áreas específicas para la producción y nixtamalización del maíz entre otras actividades económicas.

Chakraborty, Sreya [27] see Church, Jason

Chalmin, Emilie [155] see Chanteraud, Claire

**Chamblee, John (University of Georgia)**

[12]

*Institutionalized Exclusion in Social Theory*

Institutionalized exclusion biases researchers toward some theories, blinding them to others. Prior to Hegmon's 2003 publication of the "processual plus" approach to social theory, authors and teachers privileged competitive and hierarchical models over those based on cooperation or the explanation of variation, while also pigeonholing theories focused diversity, cooperation, and inclusion as "polemical." In the processual-plus era, polemical rhetoric abated, but theory building fractured along the social fault lines already dividing practitioners. Archaeological practice benefited in that researchers now make space for and give respect to alternative perspectives from historically underrepresented practitioners. However, theory development has transformed from a research activity into a political exercise that often only involves other archaeologists. Archaeologists can better serve our many stakeholders by placing theory building within the philosophical frameworks of critical realism and communicative action. In addition to the important work of talking about the diverse political, practical, ontological, and epistemological worlds in which we operate, archaeologists should seek a more formal understanding. We cannot serve all our stakeholders alone, nor (thankfully) will we develop a culture of archaeological practice that overrides our diversity. Talking about our differences is good. Understanding them and codifying our limits and goals is better.

**Chandler, Susan (Alpine Archaeological Consultants Inc.)**

[219]

*Alpine Archaeological Consultants: Leading the Way in Meaningful and Innovative Archaeological Research through CRM*

Since Alpine Archaeological Consultants (Alpine) was founded in 1987 by the husband-wife team of Alan Reed and Susan Chandler and their business partner, Jonathon Horn, the company has undergone significant growth. This expansion is evident not only in terms of numbers of employees but also in terms of the geographic extent of projects conducted and the range of services offered by the company. Alpine's core mission has been to serve the needs of clients through innovative, timely, and cost-effective strategies that allow projects to be completed within the client's timeframe. At the same time, Alpine has prided itself on conducting important archaeological research that has made significant contributions to knowledge of the archaeological record. This paper explores the transformation of one CRM firm in the context of the CRM industry in the western United States in the late 1970s to today. It focuses on how CRM can and should lead the way in meaningful and innovative archaeological research.

**Chandler, Susan (Alpine Archaeological Consultants Inc.)**

[219]

*Chair*

Chandler, Susan [219] see Douglass, John

**Chanteraud, Claire (Missouri University Research Reactor), Hélène Salomon (Environnement DYNAMIQUE et territoire de Montagne), Emilie Chalmin (Environnement DYNAMIQUE et territoire de Montagne), Eric Goemaere (Institut Royale des Sciences Naturelles de Belgique) and Jean-Victor Pradeau (Environnement DYNAMIQUE et territoire de Montagne)**

[155]

*Step-by-Step Study of a Geochemical Dataset: Epistemology around the Study of Iron Rich Rocks*

Colorants present an important diversity regarding the contexts in which they are discovered and their physical, chemical, petrographic, and mechanical characteristics. Identifying these materials provides insights into the ways Paleolithic societies used and exploited these materials. Geochemical approaches question the properties of rocks to record their history: formation, alteration, diagenesis, etc. In this perspective, few techniques allow us to access precise and reproducible quantification of the chemical elements that compose the material. We propose here a step-by-step study of the geochemical composition of six European iron-rich rocks referenced to understand the pitfalls of geochemical analysis and statistical processing of data. Thus, in order to undertake the analysis and processing of geochemical data on such archaeological materials, it appears essential to have references of various materials adapted to the study of coloring materials: (1) to calibrate the different devices to match the physical constraints related to the analysis of iron-rich materials, (2) to understand the geological mechanisms behind the composition of materials, (3) and to compare geochemical analyses conducted on archaeological materials with geological references that are not only local but also compatible from a geological point of view. It is a question here of comparing what is comparable.

**Chapa, Reymundo (Colorado State University) and Raymond Sumner (Colorado State University)**

[56]

*Improving the United States Air Force's Tribal Consultation Program*

Trust responsibilities, fiduciary obligations, Treaty Reserved Rights, and various federal laws compel the US Air Force (USAF) to consult with Native American tribes. The USAF has made great progress in developing policy and regulations that acknowledge these responsibilities, and it has created programs that seek to operationalize these efforts. But the USAF continues to struggle with these challenges, not for a lack of willingness but for absence of a consolidated plan. Military organizational structures and decentralized decision-making authorities within the USAF hamper progress and create fundamental roadblocks to open and genuine consultation. This presentation presents a different vantage to solving some of these challenges. They are rooted in short-term operational initiatives that develop tracking matrices that compliment reporting, and long-term training and planning objectives

that change military culture over time. The result of these strategies will assure the military's compliance and build and sustain trust between the USAF and Native American communities.

Chapa, Reymundo [56] see Sumner, Raymond

**Chapman, Larkin (University of New Mexico), Andrew Somerville (Iowa State University) and Matthew G. Hill (Iowa State University)**

[38]

*Stable Isotope Analysis of Animal Remains from Late Prehistoric (Oneota) Villages in Central Iowa Reveals Reliance on Maize*  
Stable carbon and nitrogen isotope analyses of remains of medium-sized canids and other taxa from several late prehistoric (Oneota) villages in central Iowa indicate that canids regularly consumed food items with high  $\delta^{13}\text{C}$  values, likely maize-based food scraps and maize-rich human feces. Results suggest the canids were human commensals, and maize comprised >55% the human diet and, indirectly, the canid diet. Application of the canine surrogacy approach is a powerful analytical tool to profiling variation in the timing of adoption and role of maize in human diet as well as the foraging ecology of canids in domestic contexts in the Midcontinent.

Chapman, Shawn [24] see Wampler, Marc

Chapoulie, Rémy [29] see Pareja, Dante

**Charles, B**

[178]

*The Can: Clandestine Infant Burials inside Everyday Objects*

Mortuary treatment in a capitalist society can be cost-prohibitive and a source of shame or guilt for those unable to pay for a proper burial. Inexpensive objects like those used in the clandestine burial of infants reflect an impulse to act on emotions such as shame, sadness, guilt, or even tenderness. Coroner reports from Milwaukee County describe the recovery of miscarried, stillborn, or infant remains from outdoor locations, often concealed inside of everyday items such as tin cans, newspapers, and shoe boxes. As the designated burial grounds for unidentified remains, the Milwaukee County Poor Farm Cemetery (MCPFC) received the contents of these clandestine primary burials and provided a publicly funded secondary burial. The living may be relieved of the financial, if not emotional, burdens that disproportionately affected women following stillborn or neonatal death. This paper combines historical research with archaeological evidence of primary disposal practices contained within secondary infant burials from the MCPFC to disentangle common heteronormative narratives about infanticide, mortuary treatment, and the criminalization of women.

**Chase, Adrian (Claremont Graduate University)**

[218]

*Urban Development in Settlement, Infrastructure, and Governance: Diachronic Changes at the City of Caracol, Belize*  
Lidar and archaeological data have revealed the urban form of Caracol, Belize, during its apogee around 700 CE until its depopulation around 900 CE. However, settlement patterns and urban forms within this city at its peak represent the cumulative history of its occupation as a palimpsest landscape produced from overlapping settlement decisions. The physical record of urban features shows results of behavior across generations and under multiple governing systems in both residential and infrastructural contexts. Residential density provides insight into the development of older and longer-lived neighborhoods and settlement areas. District nodes provide information on the construction and accumulation of urban administrative infrastructure and services. The road network of citywide causeways also provides details on path dependence in the movement of both people and goods across and within this city. Combining lidar data with archaeological and hieroglyphic records allows for a diachronic consideration of city growth, urban organization, and the dynamism of Caracol the city.

**Chase, Adrian (Claremont Graduate University)**

[54]

*Discussant*

[54]

*Chair*

Chase, Adrian [13] see Chase, Arlen

Chase, Adrian [153] see Chase, Diane

**Chase, Arlen (Pomona College), Diane Chase (Claremont Graduate University) and Adrian Chase (Claremont Graduate University)**

[13]

*Dynasties, Bureaucracies, and Governance among the Late Classic Maya: Caracol and Its Peers*

Most models of Classic period Maya governance are based on interpretations of hieroglyphic relationships and the assumption that Maya centers each housed one or more elite dynasties. The textual data have been used to argue for both city-states and for larger political units. Archaeological evidence relative to government (and governance) has also been proffered, usually in the form of rank-order data based on architectural volume or spatial configuration. These archaeological data have been used to argue for regional states among the Maya, again largely based on perceived hierarchical relationships. Conjoining archaeological and

epigraphic data to examine governance at multiple levels provides some alternatives to the previous models. These data suggest that larger short-lived, multi-city polities did exist over multiple generations, as between Copan and Quirigua and between Caracol, Tikal, and Naranjo. In some cases, the governments of these larger polities appear to have successfully negotiated governance strategies that straddled intertwined dynastic and bureaucratic concerns. Knowing the strong interrelationships that existed in the early Late Classic period between Caracol and Tikal, it is possible to make inferences about the process behind Maya Classic period politics and how multi-site governance would have worked within a dynastic system.

**Chase, Arlen (Pomona College)**

[48]

*Discussant*

Chase, Arlen [153] see Chase, Diane

Chase, Arlen [153] see Houk, Brett

**Chase, Diane (Claremont Graduate University), Arlen Chase (Pomona College) and Adrian Chase (Claremont Graduate University)**

[153]

*Identifying Ancient Neighborhoods at Caracol, Belize: Landscapes Analyses and the Archaeological Record*

A topic of interest to many Mesoamerican researchers in recent years has been the identification of neighborhoods in the archaeological record. By identifying neighborhoods within a larger urban community, archaeologists hope to gain more information on the local-level social organization of larger centers and to examine material similarities and differences among these theoretically cohesive social groups. With financial support from the Alphawood Foundation of Chicago, the Caracol Archaeological Project has engaged in the investigation of various neighborhoods within Classic period (CE 550–900) Caracol. Comparison among neighborhoods permits examination of the material record for information related to relative social status as well as access to and participation within a broader market economy. Initially, potential neighborhoods were crudely defined through topographic analysis. More recently, however, lidar has been employed with least cost path analysis in order to derive neighborhood agglomerations based on service areas. These geospatially derived neighborhood divisions can then be tested and analyzed in terms of recovered archaeological materials. These analyses suggest that what appears at first to be randomly distributed residential settlement on the ground at Caracol is actually organized in very specific ways that better integrated the site's population into cohesive local social units in antiquity.

Chase, Diane [13] see Chase, Arlen

Chase, Josh [66] see Neeley, Michael

**Chase, Zach (Brigham Young University) and Steve Kosiba (University of Minnesota)**

[224]

*Memories of New Pasts in Cuzco and Huarochiri, Peru*

For decades, historical and anthropological understanding of the late prehispanic Andes was based in large measure on the written texts produced during the periods of Spanish invasion and colonization. However, while scholarly work based on these documents has long emphasized that control and manipulation of social memory was central to the expansion of the Inka Empire, both as a medium for and as a product of the interaction between the Inka and regional and local polities, this same inherent "revisionism" complicates our ability to reconstruct particular processes of the production and reproduction of social memory. In this presentation, data from the authors' recent archaeological research in Cuzco and Huarochiri shed light on the specific processes of spatial, material, and narrative construction of collective pasts in the late prehispanic Central Andes. These archaeological data penetrate the barrier of prehistory, providing critical insight into the ways social memory was understood, codified, communicated, and made politically instrumental in the sociopolitical interactions at regional and imperial levels. Bringing these data to bear on readings of the traditions recorded in the written sources provides a vantage point from which we make more broadly applicable suggestions about the nature of collective memory.

**Chastain, Matthew (Stanford University)**

[185]

*Geological Influence on the Development of Ancient China's Bronze Industries*

Items made of bronze played a central role in the ritual and political systems of ancient China. Thus, the spread of bronze-casting technology and the emergence of distinct regional metal industries are critical to the broader story of China's Bronze Age—that of increasing integration of regional populations into a wider "Chinese" cultural interaction sphere with many shared elements of material culture. Much has been written previously about how the distribution of metal ore resources impacted both the development of metallurgy and the trajectories of early states in China. However, ancient Chinese bronze casting was as much a ceramic art as a metal art. Bronzes were cast in elaborate mold assemblies made from technologically advanced ceramic materials, and it was essential for bronze producers to have access to soil raw materials suitable for making these molds. Using archaeometric and geological data, this talk explores the possibility that regional variability in soil geology significantly influenced the way bronze-casting technologies were transmitted and developed throughout ancient China.

**Chatters, James (Applied Paleoscience), Patricia Beddows (Northwestern University), Eduard Reinhardt (McMaster University), Juan Pablo Bernal (Universidad Nacional Autonoma de México, Queretaro) and John Southon (University of California, Irvine)**

[221]

*Radiometric Dating in the Submerged Caves of the Yucatán Peninsula*

Submerged Yucatán caves are a rich in Late Pleistocene fossils and were actively mined by Paleoindians, but the scientific potential of these finds won't be realized if they're not accurately dated. Never easy, dating Pleistocene remains is especially problematic when they have been submerged for millennia in waters rich in carbonate and organic material. Bone collagen is rarely preserved; charcoal and wood float, and can move about the caves long after originally deposited. The food chain in dark caves can be based on ancient carbon, as from guano or dissolved inorganic carbon (DIC) from limestone bedrock, leaving suspect any organic material of uncertain origin. Bioapatite can be contaminated by DIC, producing falsely ancient dates. All this renders <sup>14</sup>C dating difficult. Uranium-thorium dating can only be applied in restricted cases. Sea level history is only now becoming understood enough to be a chronological guide. We address means we have used to surmount, or at least limit these problems in studies of the natural trap of Hoyo Negro and the ochre mines of Quintana Roo. One outcome is enhanced confidence in the ~12.9 ka enamel age of "Naia" the young woman from Hoyo Negro, verifying her as early Paleoindian (includes human remains).

**Chatters, James (Applied Paleoscience)**

[221]

*Chair*

Chatters, James [47] see Hackenberger, Steven

Chatters, James [221] see Petrovic, Vid

Chatters, James [221] see Reinhardt, Eduard

Chatters, James [221] see Rock, Barrett

**Chauhan, Parth (IISER Mohali), Ketika Garg (University of California, Merced), Prabhin Sukumaran (Charotar University of Science and Technology), Vaneshree Vidhyarthee (University of Oxford) and Yezad Pardiwalla (IISER Mohali)**

[149]

*Investigating Prehistoric Population Dispersal and Interconnectivity in India through GIS Spatial Analyses and Computational Modeling*

Situated in the center of the Old World and comprising diverse environments, the Indian subcontinent was a conducive region for prehistoric human occupations and a possible biogeographic corridor for dispersals across southern Asia. Widespread and diverse stone tool occurrences indicate increasing mobility by different hominin groups/species since initial colonization. This paper investigates techno-cultural transitional relationships and associated population connectivity between different hominin groups from broad spatial perspectives. Based on typological sequences of stone tool records and associated locational data in the academic literature, we use computational models and network analyses to illustrate potential scenarios of population dispersal and interconnectivity, and techno-cultural diffusion across India. We also utilize Landsat imagery and ArcGIS to examine interregional and intraregional spatial overlap between different technologies as well as key biogeographic corridors and barriers to theoretically discuss variable degrees of population continuities and multi-directional migrations across India. Despite inadequate absolute dates, our tentative spatial analyses highlight several discrete pockets of broad technological continuity throughout the Paleolithic and Mesolithic phases. Based on the known geographic features of India and the associated distribution patterns, it seems possible that older technologies survived longer in the more geographically isolated zones which also may have accommodated independent transitions.

**Chavez, Juan (University of California, Riverside)**

[124]

*Communities and Networks in the Precolumbian Eastern Tropical Mountains: Exploring Migration from a Bioarchaeological Perspective*

The eastern tropical mountains are a strategic, transitional area where local communities managed to set alliances and transform the dynamics of interaction with foreign polities. Traditional views on the Eastern Andes' past suggest that expansive Andean States took over local polities and turned their inhabitants into subjects at the service of foreign administrators. No significant links were identified with the Amazon, although research in this region remains fragmentary. In contrast, critical studies argue that the Eastern Andes inhabitants engaged actively in cross-regional trade relations with neighboring polities both in the Andes and in the Amazon. This paper explores how precolumbian local communities from the Eastern Andes managed to set alliances with peer polities and complex societies from a bioarchaeological perspective. Besides using material culture distribution as empirical evidence to set apart communities regionally, this paper uses human biological remains from archaeological contexts to explore migration patterns in the Eastern tropical mountains.

**Chavez, Sergio (Central Michigan University)**

[192]

*The Strength of Stone: A Case of Aymara Psychotherapy on the Copacabana Peninsula, Bolivia*

Derived from a number of interviews to key Aymara-speaking informants in the town of Copacabana, a traditional method was documented dealing with a kind of Psychotherapy aimed at helping children and adults to overcome or control emotional/personality difficulties so that they can function in their social lives and community. The method, which was passed down over generations, involves taking the patient to a large rock outcrop, and repeatedly pecking a spot on the rock with a hand-held stone hammer until

enough dust is produced, and inhaling it through the nostrils. The repeated pecking leaves deep concave depressions, which are similar in size and shape to rock depressions found on archaeological sites associated with Inca period rock outcrops.

Chavez Arce, Roberto [221] see Nava, Alberto

Chaytor, Jason [46] see Jones, Douglas

**Chazin, Hannah (Columbia University)**

[43]

*Discussant*

**Cheek, Charles**

[53]

*The Role of Ornamentation: The Mayan Flexible Ear Ornament*

The flexible ear ornament, substituting for ear spools and other stone and shell ear ornaments, was noted early as an element of Maya adornment. It was not until the latter half of the twentieth century that scholars argued these signaled a prisoner. This belief is widespread among Mayanists, other archaeologists, and the public. The idea may have become popular just as we were beginning to realize the importance of warfare among the Maya. An examination of a wide range of media shows that this ornament occurs mainly on warriors, who were sometimes captives, and on people in ritual contexts where no war artifacts occurred. Stone media also showed warrior rulers with such ear ornaments. Historical scenes on polychrome pottery almost only show prisoners without ear ornaments but with bloody ears.

**Chen, Hsi-wen**

[158]

*Models Based on Farming Strategies to Assess the Hierarchy among Polities in Ancient Northeastern China*

Models based on farming strategies that are aimed at managing risks associated with unpredictable precipitation in northeastern China have been proven to be a good indicator of settlement locations in premodern societies. This poster aims to extend and examine the utility of these models by assessing the relations and potential hierarchy among identifiable ancient polities in archaeological settlement studies. Predictions about internal social dynamics underlying the formation of these regional scale socioeconomic units will be referred to and tested against the results of our analyses, which may provide implications for the relationship between subsistence strategy and the working of ancient socioeconomic units beyond the local scale.

**Chen, Jennifer (Pennsylvania State University), Randy Haas, BrieAnna Langlie and James Watson**

[38]

*A Mixed Archaic Diet on the Andean Altiplano, 9.0–6.5 ka*

Important subsistence resources like potatoes, quinoa, and vicuña were domesticated in the South American Andean Highlands. This research examines the extent to which the wild predecessors of these domesticates were used in Archaic forager economies, 9.0–6.5 cal ka. Stable carbon and nitrogen isotope chemistry of human bone alongside paleoethnobotanical and zooarchaeological remains from the Altiplano sites of Soro Mik'aya Patxja and Wilamaya Patxja reveal a mixed diet of meat and plant resources, including vicuña, Andean deer, and tubers. Surprisingly, the isotope data indicate that the proportions of meat and plant consumption remained relatively constant over 2.5 millennia despite appreciable population growth that theoretically should have increased reliance on plant resources.

Chen, Jianli [32] see Wang, Qingzhu

**Chen, Ran (The University of Arizona)**

[185]

*Exploring the Use of Microliths in the Early Chinese Neolithic: A Functional Study Based on Use-Wear Analysis and Residue Analysis*

Microliths, specifically microblades, were widely used in parts of China from the Upper Paleolithic to the Neolithic. In China, studies of these artifacts have mainly concentrated on the origins and development of pressure microblade technology. There have been few studies of the functions of these artifacts. In this study, I apply use-wear analysis and residue analysis to generate a broad interpretation of the functions of microliths from the Yumin and the Simagou sites (8400 BP) in Inner Mongolia. The results show that microliths are multifunctional and they are not just elements of projectiles. They were involved in processing both plant and animal resources. Residue analysis shows that a variety of plant materials were exploited, including grasses, tubers, and beans. The functional analyses provide possible evidence for an increase of plant exploitation over time, probably reflective of a broad pattern of Neolithization in south-central Inner Mongolia.

Chen, Xianglong [185] see Li, Jingbo

Cheng, Luxia [32] see Wang, Yifan

**Cheong, Kong (American University), Scott Macrae (Trent University) and Gyles Iannone (Trent University)**  
[82]

*Burmese Societal Transition at the End of the Bagan Empire*

The Bamar people migrated down the Ayeyarwady River into the Central Dry Zone of Myanmar in the ninth century and later founded the first Burmese Empire (eleventh to fourteenth century CE) at the walled and moated epicenter of Bagan. The royal authority of Bagan invested heavily in infrastructure, developing agricultural lands, establishing complex water management systems, and building roads, bridges, and rest houses for travelers. Having established itself as the regal-ritual “exemplary” center for a Buddhist state, Bagan implemented an aggressive scheme of religious monument construction, attracting labor and pilgrims, and building up the tax-base and income required to perpetuate a program of construction and infrastructure improvements. By the onset of the fourteenth century, Bagan was no longer able to sustain its political authority, and it was forced to relinquish its position as the dominant center in the western portion of Southeast Asia. We discuss the various environmental, economic, and political factors that both contributed to Bagan’s decline and resulted in the emergence of several smaller successor states. We incorporate insights from inscriptions and retrospective chronicles, as well as data from archaeological excavations carried out within the walls of the royal city and in the surrounding peri-urban settlement zone.

Cheong, Kong [218] see Iannone, Gyles

Cheong, Kong [18] see King, Adam

Cheong, Kong [181] see Macrae, Scott

**Chicoine, David (Louisiana State University) and Amy Hair (Louisiana State University)**  
[92]

*Photogrammetry and 3D Modeling at Cerro San Isidro, Nepeña Valley, Peru*

This poster presents 3D models generated from photogrammetric data and reconstructions at the ancient center of Cerro San Isidro, Nepeña Valley, north-central coast of Peru. Cerro San Isidro is a multicomponent archaeological complex that, based on its size and strategic location, is interpreted as one of the most important ancient human centers in the Moro region of the middle Nepeña Valley. Excavations in 2019 brought to light a complex occupational sequence and material remains associated with several local and foreign art styles. Fieldwork focused on a late compound where seven excavation blocks brought insights into the spatial organization of what is preliminarily interpreted as an elite residential compound, as well as its stratigraphy, and sequence of occupation. This poster presents the results of the photogrammetric reconstructions and 3D modeling of the excavation contexts and complete objects. Based on stratigraphic, stylistic, and radiometric data, the deposits document a long and complex occupation history between the Late Formative (or Early Horizon) and the Late Intermediate period. The 3D models highlight the value of photogrammetry as a method of recording and visualizing archaeological deposits and artifacts.

Chicoine, David [84] see Munro, Kimberly

**Chilcote-Fricker, Celise (University of Kentucky)**  
[180]

*Discussant*

Childress, William [117] see Gingerich, Joseph

Childs, S. Terry [81] see Heckman, Jasmine

**Chinchilla, Oswaldo (Yale University)**  
[128]

*Parody and Satire in Maya Art*

In several works, Karl Taube highlighted the humoristic angle of selected representations in ancient Maya art. In this talk, I build on his insights and explore the possible use of parody and satire in Maya mythical representations. A brief comparative discussion of these literary and artistic resources in cross-cultural perspective provides a background to discuss selected representations in Maya ceramics that can be interpreted as probable parodies of others. In addition, artistic renderings of mythical episodes suggest satirical connotations that are not immediately evident without prior understanding of comparable episodes in Mesoamerican narratives. Attention to the possible use of parodies and satires by ancient Maya artists opens largely unexplored avenues of interpretation of Classic Maya imagery.

**Chinique de Armas, Yadira (University of Winnipeg), Silvia Hernandez Godoy (Dirección Provincial de Cultura: Matanzas, CU), Ulises Gonzalez Herrera (Instituto Cubano de Antropología) and Jason Laffoon (Leiden University)**  
[19]

*First Insights into the Mobility and Provenance of “Archaic Age” Indigenous Populations from Cuba Using a Three Isotope System ( $^{87}\text{Sr}/^{86}\text{Sr}$ ,  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}_{\text{en}}$ )*

The first populations that inhabited the Antilles were traditionally understood as small highly mobile homogeneous groups of hunters, fishers and gatherers. While recent data demonstrated that some populations engaged in the production of domestic plants

and cultivars, questions remain about other aspects of their lifeways, including their mobility patterns. Here we combined enamel strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ), oxygen ( $\delta^{18}\text{O}_{\text{en}}$ ) and carbon ( $\delta^{13}\text{C}_{\text{en}}$ ) isotopes to assess the mobility, and potential areas of provenance, of individuals from two archaeological sites from Cuba: Canimar Abajo (OC: ca. 2212–803 BC; YC: ca. AD 360–1012) and Playa del Mango (ca. 116 BC–AD 241). Results suggested that the older individuals from Canimar Abajo had similar dietary practices where resources were obtained from an isotopically restricted area (close to the coast). This evidence suggests that some of the earliest known inhabitants of Cuba were less mobile than previously acknowledged. Regional mobility increased over time with some individuals being likely nonlocals. In contrast, most individuals from Playa del Mango had  $^{87}\text{Sr}/^{86}\text{Sr}$  out of the local fauna range. They showed greater variation in all isotope values, suggesting that they exploited resources from a wider territory. This supports previous evidence suggesting that populations with different lifeways inhabited Cuba in early times.

**Chinique de Armas, Yadira (University of Winnipeg)**

[19]

*Chair*

Chinique de Armas, Yadira [125] see Reyes, Idalí

**Chiou, Katherine (University of Alabama), Araceli Aguilar-Meléndez (Universidad Veracruzana), Christine Hastorf (University of California, Berkeley), Andrés Lira-Noriega (Instituto de Ecología, México) and Emiliano Gallaga (Universidad Autónoma de Chiapas)**

[151]

*Peppers and People in Mesoamerica: A Multidisciplinary Approach to Tracing the Origin and Domestication of Chiles (Capsicum annum var. annum L.)*

[WITHDRAWN]

**Chiou, Katherine (University of Alabama)**

[58]

*Moderator*

Chiou, Katherine [20] see McKenzie, Emily

Chipps Stone, Abigail [186] see DeVos, Paige

**Chiriboga, Carlos (Proyecto Arqueológico El Tintal)**

[62]

*Mapping Monumentality: Architectural Planning and Urban Design at El Tintal, Petén, Guatemala*

By the end of the Late Preclassic (ca. AD 200), the site of El Tintal developed into a major center, comparable in size, architecture and material culture to other Preclassic centers of the Central Karstic Uplands. Four large pyramids were constructed, towering over the forest canopy and providing direct views of the contemporaneous centers of El Mirador and Nakbe. Multiple causeways connected Tintal to sites in the region, the longest of which led to El Mirador, some 20 km to the north. However, an E-Group architectural assemblage, a feature shared among its neighbors, is conspicuously absent. The following paper presents a brief overview of recent archaeological investigations at El Tintal, focusing on the survey and mapping history of the site, including the new, complete site map, which covers 25 km<sup>2</sup> and includes over 2,500 structures. Finally, I present evidence that multiple calendrical alignments which are usually found in E-Group architectural assemblages were incorporated in the site's general layout, suggesting the initial implementation of a detailed urban plan by inhabitants of El Tintal which was preserved and maintained throughout the site's history.

Chiriboga, Carlos [153] see Acuña, Mary Jane

Chirikure, Shadreck [41] see Stephens, Jay

Chkadua, Marine [111] see Wright, Sterling

Chong, Jianrong [185] see Li, Jingbo

**Christie, Jessica (East Carolina University)**

[59]

*Regarding Ancient Maya Blue: Academic versus Contemporary Yucatec Maya Discourses*

This paper interrogates research regarding the composition and production of ancient Maya blue pigment through the overlapping lenses of scholarly research (as one aspect of “authorized heritage discourse”; Smith 2006) and “popular heritage discourse” as exemplified in the work of Yucatec Maya artist Luis May Ku. In the 1950s, Western science determined by powder diffraction that Maya blue pigment (MB) was a composite of palygorskite and indigo derived from the leaves of the anil plant. Numerous recent studies have analyzed the chemical structure, properties, and production of MB. Around 2018, Luis May Ku began to study reports

by Mexican scholars regarding recipes for MB and started his own experiments. It took him years to identify the local version of the indigo plant, called *ch'oj*, and to produce his first batch of MB. He now holds a patent on *ch'oj* MB and sells flasks internationally through his Facebook site. He continues to experiment with shades from blue to green and is increasing production. This paper discusses the questions of how "scientific" truth is constructed and used by scholars and contemporary Maya artists in top-down versus bottom-up approaches and how contemporary Yucatec Maya identities are shaped in the twenty-first-century market.

**Christman, Carrie (Commonwealth Heritage Group) and Robert Watson (Commonwealth Heritage Group)**

[182]

*Intelligent Discontent: Results of Archaeological Monitoring during the Construction of the Pullman National Monument*

In 2020 and 2021, Commonwealth Heritage Group was contracted by Chicago Neighborhood Initiatives to monitor construction at the historic Main Factory complex of the Pullman National Monument. Construction activities were related to site development for historical interpretation and a public museum in coordination with the Illinois Department of Natural Resources and the National Park Service to document any significant resources related to the Pullman period (1880–1897). A landscaping wall associated with Lake Vista, the South Erecting Shop foundation, and the Workers' Gate foundation were encountered during construction and determined to contribute to the significance of the site. The Workers' Gate and gatehouse is one of the most recognized locations at the Main Factory complex and is symbolic of the American Labor Movement. The archaeological remnants of the Workers' Gate and gatehouse indicate that George Pullman constructed it and posted a watchman to assert more control over his workers during a time of escalating labor tensions. Cultural materials associated with the Workers' Gate foundation and other site locales provide insight into the consumer choices made by the Pullman workers and illustrate some of the ways Pullman workers and residents resisted company control.

**Chu, Alejandro**

[3]

*The Emergence of Monumental Architecture at the North-Central Coast of the Central Andes: Evidence of Social Complexity?*

In the last decades research at the north-central coast of Peru has confirmed the early emergence of monumental public ceremonial architecture during the Late Preceramic period (LIP). This monumental architecture has been considered as the material expression of complex polities that have been labeled from chiefdoms to pristine states. The actual level of research in the Central Andes points out that several LIP architectural traditions developed in the region and shared certain cultural traits, but at the same time maintained a political, social, and economic autonomy. In this paper, I will explore different lines of evidence, available so far, from these Central Andes architectural traditions. This will allow us to identify the social processes involved in the construction of a non-domestic architecture of monumental scale by these communities and try to answer the question: How complex the LIP Central Andean social groups were?

**Chu, Alejandro**

[3]

Chair

**Church, Gloria (University of Louisiana, Lafayette)**

[27]

*The Mortar and Brick Analysis of Archaeological Remains from Evergreen Plantation*

During the summer of 2021, archaeological excavation at Evergreen Plantation in St. John the Baptist Parish, Louisiana, revealed an abundance of brick and mortar in the test units. After performing an acid digestion mortar analysis, a conclusion was drawn that the mortar is lime based. Considering the history of lime mortar, we can assume a range of dates in which the building could have been built. The bricks found in each test units were categorized based on Munsell coloration, Mohs Hardness Scale, and physical characteristics. This brick analysis gives information to prove what type of bricks were found as well as what purpose the bricks would give in the found archaeological remains of a chimney fall.

**Church, Jason (NCPTT), Ina Sthapit (NCPTT), Sreya Chakraborty (NCPTT) and Isabella Jones (NCPTT)**

[27]

*Evergreen Plantation in the Digital Era*

NCPTT is currently conducting a project digitally documenting existing slave and tenant structures throughout the United States. In 2021 NCPTT documented all 22 slave cabins at Evergreen Plantation in St. John Parish, Louisiana. The cabins were documented using laser scanning and made into 3D models. These models are available for researchers to study in detail including measured drawings, 3D walk throughs, and virtual reality. Currently archaeologists working to locate lost structures in Evergreen's Quarters can remotely take building and site measurements from the virtual models. This presentation will show how NCPTT documented this site and how those models are available to researchers.

Church, Jason [197] see Eldredge, Kaitlyn

**Church, Warren (Columbus State University, GA)**

[192]

*Terminal Prehispanic Occupations at Gran Pajatén in Peru's Northeastern Andean Cloud Forest*

Archaeological investigations between 1965 and 2000 rendered ample evidence of Inca presence in and around the upper Montecristo valley cloud forest, or Ceja de Selva. Excavations yielded an abundance of Inca pottery at several sites that typically lacked additional evidence that would suggest substantial involvement of Inca administrators and imperial control over local

populations. This presentation evaluates cultural remains from the final occupations at Gran Pajatén and nearby sites like Los Pinchudos, La Playa, and Manachaqui Cave. Various classes of evidence including radiocarbon dates, architectural forms and styles, and skeletal trace elements are considered, first to suggest probable dates of terminal site occupations, and second to inquire whether the Inca exerted direct, indirect, or any control over Montecristo valley populations.

**Cianciosi, Alessandra (University of Amsterdam; Stanford University) and Stefania Manfio (Stanford University)**  
[107]

*Traveling Together and Keeping Apart: The Impact of Changes in Transportation Technology and Medical Policies on Human Mobility in the Indian Ocean during the Nineteenth Century*

This paper aims to illustrate the relationships between the indentured laborers' diaspora, the progress in maritime technology, and the crises caused by the outbreak of epidemics in the British Indian Ocean colonies. Indeed, the improvement of shipping conditions and the advent of steamships made the voyage faster and safer on ships transporting laborers, reducing the mortality rate. Still, the negative side to the speed of transport was the increased transmission of diseases in the colonies, which imposed aggressive counter-measures. Among the various colonial reactions, the establishment of quarantine stations was an effective system extensively applied in the Indian Ocean during the second half of the nineteenth century. This system has also had reverberations on maritime routes and has caused serious environmental impacts on small islands or remote and uncontaminated places. The combination of land and maritime investigation has the potential to open a window onto otherwise opaque elements of life on board for indentured people, their negotiation for a better health system, and the way diseases were spread. Therefore, we would like to enhance the role of historical archaeology in bringing these material entanglements to the fore, suggesting greater correspondence to discussions on past and present mobilities.

Ciborowski, Jake [149] see Nash, David

Cifuentes Argüello, Rosalba Yasmin [91] see Woolfolk, Paige

Ciofalo, Andy [125] see Donner, Natalia

**Ciolek-Torello, Richard (Statistical Research Inc.)**  
[215]

*The Sierra Ancha: A Geographic Boundary and Cultural Frontier in the Arizona Transition Zone*

The Sierra Ancha is a mountain massif extending south from the Mogollon Rim. Like much of the Transition Zone, a variety of people took advantage of its geographic and resource diversity over time. During the fourteenth century, it was the boundary separating Western Pueblo culture, which was expanding into the mountainous plateaus and canyons to the east, and Classic period Salado in Tonto Basin to the west. The relationship between these two groups is unclear. An uninhabited no-man's land with fortified settlements on either side, like that found on the Northern Periphery of the Phoenix Basin, suggests a high degree of hostility, whereas shared pottery and burial patterns indicate extensive interaction between these two groups. In this respect it is important to recognize that this frontier stood in stark contrast to earlier times when Hohokam migrants from the Phoenix Basin and an early Mogollon population akin to the Sinagua co-resided peacefully in settlements that extended from Tonto Basin across the southern and eastern flanks of the Ancha and even as far east as Whiteriver. It is likely that this manifestation of Western Pueblo culture incorporated the descendants of earlier Mogollon and Hohokam populations and their cultural traditions.

Cipolla, Lisa [56] see Esdale, Julie

Ciugudean, Horia [71] see Arnold, Elizabeth

Ciugudean, Horia [71] see Leahey, Aidan

Ciugudean, Horia [71] see Subramaniam, Nandini

Ciugudean, Horia [71] see Waterman, Anna

Civitello, Jamie [127] see Steffen, Anastasia

**Clark, Amy (Harvard University)**  
[117]

*Mobile Cores? The Unique Spatial Patterning of Cores within a Sample of Open-Air Paleolithic Sites*

One of the strongest patterns to emerge from an intrasite spatial analysis of nine Middle and Upper Paleolithic open-air sites from France concerned the spatial position of cores. Cores were not found associated with the bulk of reduction debris, even those pieces with which they refit. Instead, cores were overwhelmingly found in low density parts of the site. What does this pattern suggest? Caching? Use for other purposes? Inadvertent movement? On this poster I will present data from the spatial analysis study, as well as supplementary examples found in the published literature. I will suggest potential approaches to answering the questions posed above, but in addition I will seek input and supplementary examples from conference attendees.

**Clark, Amy (Harvard University)****[117]***Chair***Clark, Geoffrey (Arizona State University)****[187]***The Deep Structure of the Archaeology of Deep Time*

Shea and others have argued that Paleolithic archaeology has two distinct metaphysical paradigms, both claimed to be “evolutionary” but divorced to a greater or lesser extent from the formal conceptual framework of human paleontology. Despite application of more sophisticated methodologies, the most important consequence of this schism is a divergence in the explanation of pattern and process, resulting in either a narrative, in the case of culture history (CH), or a complex adaptive systems (CAS) approach, in the case of evolutionary archaeology (EA). Although the former is “history-like” and the latter “science-like,” neither has a conceptual framework of the power and generality of biological evolution. Explanation in CH is consistent with narrative, and explanation in both EA and HP aspires to the generalizable properties of biological evolution. But despite its powerful conceptual framework, human paleontology also resorts to narrative and there is much controversy over the credibility and significance of its basic analytical units—species. Explanations in all three fields are, therefore, only partial. History and context affect explanation in CH, testability is a problem with CAS, and, in default of paleogenomics, the mechanisms of change in HP are opaque.

Clark, Geoffrey [187] see de Lombera-Hermida, Arturo

**Clark, Jeffery (Archaeology Southwest)****[175]***Chair*

Clark, Jeffery [5] see Smith, Jaye

Clark, Julia [99] see Batsuren, Byambadorj

Clark, Julia [99] see Jamsranjav, Bayarsaikhan

**Clark, Morgan (Brown University), Stephen Houston (Brown University), Thomas Garrison (University of Texas at Austin), Timothy Beach (University of Texas at Austin) and Elizabeth Marroquin (Universidad de San Carlos de Guatemala)****[104]***Citadels, Sieges, and Water Supply: Maya Warfare at La Cuernavilla, Guatemala*

The discovery of large-scale fortifications in the Buenavista Valley of Guatemala raises key questions about the nature, scale, and conduct of war among the Maya. Equipped with extensive walls and a high water reservoir, its main citadel—La Cuernavilla—lies relatively close to the dynastic capital of Tikal. Its walls, moats, berms, and surveillance features clearly served to protect or surveil that city and the western reaches of its kingdom. Lidar of La Cuernavilla is now supplemented by excavation. The reservoir of La Cuernavilla reveals its dating, manner of construction, volume, and likely users. Evaluations of structures nearby and evidence of rampant burning underscore the high probability that the citadel and its related fortresses were designed for sieges. This finding attests to high-intensity conflict in the final years of the Preclassic period and at the time of Teotihuacan’s intrusion into the Maya Lowlands. La Cuernavilla provides further evidence that this intrusion was neither light nor gentle.

**Clarke, Mary (Boston University)****[110]***Household and State Provisioning Strategies: Applying a Distributional Approach to Assess Marketplace Exchange at Xultun, Guatemala*

Economic transactions between state institutions and domestic producers have been evaluated based on a number of variables, one of which is through marketplace exchange. Because marketplaces provide individual households, regardless of socioeconomic status, equal access to the same goods, marketplaces are indicated by a shared heterogeneity in consumed local and nonlocal goods in household assemblages. Patterns that diverge from this baseline have the potential to indicate alternative exchange networks. Through the analysis of obsidian, chert, quartzite, granite, limestone, and pottery resources, which encompass a total of 94 varieties of local and imported goods, this paper applies Hirth’s (1998) distributional approach to evaluate complexities within Xultun’s local provisioning networks. To this point, the five households included in the comparison represent a sample from the urban core and include one palatial and administrative complex where patterns indicate surplus wealth was being stored for marketplace conversion. This application of a multiproxy analysis provides an opportunity to evaluate a local economy and the multifaceted nature of its exchange networks that tied together households, state institutions, and a marketplace. The paper concludes with implications of this research given the state of discourse surrounding economies in Classic Maya society and Mesoamerica more broadly.

**Clasby, Ryan (Western Illinois University) and Atsushi Yamamoto (Yamagata University)****[124]***Migration, Empire, and Cultural Disruption in the Ceja de Selva of Northern Peru*

Inca and Spanish incursions into the Jaen region of the northeastern Peruvian Andes during the fifteenth and sixteenth centuries were said to be met by stiff resistance from Jivaro-speaking Indigenous populations, themselves thought to be recent migrants from

the Amazonian lowlands as represented by the sudden and ubiquitous appearance of corrugated ware after AD 1000. While scholars have attempted to track the movement of these late migrations through ceramics and linguistic studies, little archaeological attention has been given to the nature of the societies that occupied the Jaen region from the late Intermediate period to the early colonial period. In this paper, we use recent archaeological evidence from the Jaen region to explore the social organization of societies in this zone as well as their interactions and conflicts with both the occupations that preceded them and the arrival of the Inca Empire.

Clasby, Ryan [84] see Yamamoto, Atsushi

**Clay, Elizabeth (University of Pennsylvania)**

[80]

*From Plantation to Placer: Post-emancipation Shifts in Labor in French Guiana*

Abolition in French Atlantic colonies in 1848 brought change and continuity to plantation societies. In French Guiana (Guyane), as elsewhere in the broader Caribbean and circum-Caribbean South America, the plantation system continued for several decades after emancipation using free wage labor. However, new communities simultaneously emerged with the influx of indentured workers from China and India, brought primarily to fuel the burgeoning post-emancipation gold mining industry. This economic venture brought new sites of labor; namely, the placer, which refers to the relatively short-lived mining camps established near mineral deposits. This paper explores post-abolition shifts in labor, space, and population in one region of Guyane during the latter half of the nineteenth century. Using an analysis of vital records from 1848–1900, I establish a partial population history for the region that accounts for the gradual decline of the plantation and the rise in mining as an important form and site of exploitative labor.

**Clayton, Sarah (University of Wisconsin, Madison), Nawa Sugiyama (University of California, Riverside) and Karl Taube (University of California, Riverside)**

[163]

*Inscribing Clay and Stone: A Multimedia Study of Writing and Literacy at Teotihuacan*

During the first half millennium CE, Teotihuacan flourished as the capital of a powerful state that dominated central Mexico and influenced distant polities. More than a century of research has generated information about material culture, governance, and everyday life at Teotihuacan. However, compared to that of early states such as the Classic Maya, Teotihuacan's written record remains enigmatic. The purposes that writing served, the kinds of information conveyed, and aspects of literacy (who could read, who could write, and who engaged with script?) are not well understood. In this symposium honoring George Cowgill, we consider the social dimensions of writing in Teotihuacan society. Epigraphic studies at Teotihuacan have focused primarily on painted murals, but the corpus of inscriptions includes a variety of other media. Here, we examine patterns in the appearance of signs as graffiti etched onto ceramic artifacts in domestic contexts and as petroglyphs carved into stone. The recurrence of some signs across diverse material media and socio-spatial contexts, ranging from the personal to the monumental, suggests that many elements of script were widely used and understood. We suggest that writing at Teotihuacan was not exclusively state-controlled but was a prevalent form of communication, individual expression, and social integration.

**Clayton, Sarah (University of Wisconsin, Madison)**

[163]

*Chair*

Clayton, Sarah [162] see Binkley, Megan

Cleland, Timothy [117] see Gingerich, Joseph A. M.

**Clements, Sarahjayne and Abigail Hunt**

[12]

*Enabled Archaeology: The Exclusive History and Inclusive Future of UK Archaeology*

The UK archaeology sector is well-established as the “preserve of young, fit, and healthy people” (Phillips and Gilchrist 2012:674), and that “toxic masculinity and ableism [are] inherent in the way we view archaeological labour” (Fitzpatrick 2016, 2020). While there is a body of informative literature and inclusive practice stretching back over 20 years, there is also evidence to suggest that dis/abled people are currently underrepresented in archaeological workforces (Aitchison, German, and Rocks-Maqueen 2020) and that they endure negative and discriminatory experiences in the field (Colaninno et al. 2020; Fitzpatrick 2016, 2020; Fraser, 2007; Klehm et al. 2021; O'Mahoney 2018; Rocks-Maqueen 2014; Tucker and Horton 2019). A review of the literature on Enabled Archaeology clearly shows that a shift in philosophy and working practices is needed for archaeology to become fully enabled, or inclusive. To achieve this, the discipline must develop, share, and adopt new and inclusive methodologies for fieldwork (Hunt and Kitchen 2021). This paper looks back at the exclusive history of the UK archaeology sector, the current situation, and potential changes in thinking and practices to ensure a more inclusive environment for dis/abled/Enabled archaeologists.

Cleveland, Mitchell [20] see Beller, Jason

Clindaniel, Jon [189] see Splitstoser, Jeffrey

Close, Hilary [89] see Wenger, Sarah

Coats, Waylon [21] see Pryor, John

**Cobb, Charles (Florida Museum of Natural History)**

[25]

*Discussant*

Cobb, Charles [8] see Krus, Anthony

**Cobb, Emilie (High Point University), Sara Juengst (University of North Carolina, Charlotte), Bethany Turner-Livermore (Georgia State University) and Richard Lunniss (Universidad Técnica de Manabí)**

[38]

*Dietary Changes at Salango: An Analysis of Isotopic Data from the Guangala Culture*

The archaeological site of Salango, on the coast of Ecuador, has been inhabited for thousands of years by multiple different cultures, including Guangala (100 BCE–750 CE). While Guangala mortuary treatment and sociocultural characteristics have been investigated, there is a lack of research into diet and biochemical studies have not been conducted. This poster discusses stable isotope analysis carried out on Very Early Guangala (100 BCE—1 CE) and Early Guangala (1 CE—300 CE) phase burial assemblages at Salango and its implications for evaluation of possible differences in dietary resource and resource access. The sample includes individuals of various sexes and age groups. Our research shows that the individuals mostly consumed marine protein resources, which is to be expected for the area, and C<sub>4</sub> resources (maize). Comparisons between the two time periods highlight that while dietary protein did not likely change over time, the overall diets did vary. Using scatter plot analysis, it is evident that diet at Salango changed temporally due to a variety of different factors including food scarcity in the Very Early Guangala period and the emergence of more complex power systems in Early Guangala.

Cobb, Emilie [193] see Juengst, Sara

Cobb, Lona [66] see Bledsoe, Jacob

Codding, Brian [160] see Magargal, Kate

Codding, Brian [47] see McCool, Weston

Codding, Brian [47] see Vernon, Kenneth

Codding, Brian [47] see Wilson, Kurt

**Codlin, Maria (Boston University)**

[23]

*Animal Subsistence Economies at a Mesoamerican Metropolis: Teotihuacan*

Mesoamerica is a unique example of a center of urban development that thrived in the absence of large, domesticated animals. While Teotihuacan is well-known for its highly commercialized craft economy, the subsistence economy of this ancient Mesoamerican metropolis is, by comparison, poorly understood. This paper compares animal consumption at two ethnically distinct neighborhoods in the southern and western sectors of the city: Tlajinga and Tlailotlacan. By integrating Zooarchaeology by Mass Spectrometry (ZooMS), stable carbon isotopes, and zooarchaeological analysis, this project examines the relative contribution of multiple acquisition strategies (animal management, hunting and trapping, and lake resource exploitation) to the subsistence economy at one of Americas' earliest cities. Contrasting consumption patterns at these two neighborhoods emphasizes the diversity of subsistence strategies employed at Teotihuacan.

**Coe, Marion (Baylor University)**

[213]

*Coiled Café: Reconstructing Gender in the Eastern Great Basin Using Perishable Artifacts*

As a technologically complex material class, perishable artifacts may potentially address a multitude of socioeconomic activities and behaviors in forager populations. However, their application to these subjects is constrained by poor preservation and small sample sizes. This paper presents an updated approach to analysis that utilizes the *chaîne opératoire* of coiled basketry and cordage to characterize technological organization. I analyze museum-curated materials from cave and rockshelter sites in the eastern Great Basin, which are associated with flexible subsistence strategies including seed processing and small-game hunting. I propose that the variability in technological-stylistic traits in Holocene basketry and the homogeneity of traits in cordage illustrates maintained gender-directed craft traditions and kinship strategies. The mix of basketry manufacturing methods in the late Holocene is potentially reflective of diverse populations of women marrying into a stable, craft-conservative population of men, as a result of increased contact with populations of people on the foraging and farming spectrum of subsistence in the Desert West. This paper demonstrates the informative value of perishable artifacts in reconstructing complex subsistence practices as well as dynamic scales of identity in prehistoric forager populations.

**Coe, Marion (Baylor University)****[213]***Chair***Coffey, Grant (Crow Canyon Archaeological Center) and Mark Varien (Crow Canyon Archaeological Center)****[152]***Chaco Great Houses in the Great Sage Plain of Southwestern Colorado*

The expansion of the Chacoan regional system into southwestern Colorado is evidenced by a variety of architectural expressions that span a long period of time. This paper examines these nuanced expressions by focusing on Chaco-style great houses and associated features located in the Great Sage Plain of southwestern Colorado. Information on these Chacoan sites has been compiled during a series of projects that began in the late 1980s and that continues with ongoing fieldwork and data collection that is part of the Community Center Reassessment Project. We present an inventory of all known great houses, assess their chronological development, document variation in their size and construction, examine their association with other types of public architecture, and discuss groups of great houses that occur in distinct clusters. We conclude by examining the connection between these sites and those in Chaco Canyon and at Aztec.

**Cohen, Chelsea****[154]***Great River in a Good Land: Landmaking and Landscape Changes in North American Riparian Ports*

Riparian urbanization fundamentally changed both the ecological composition of estuarial landscapes and the relationship between people and their water resources. In the eighteenth-century North American Atlantic, interior agriculture and the concomitant development of estuarial ports led to the clearing out of old growth forests and building out land from river banks, processes that continue to shape contemporary landscapes. By comparing the *longue durée* environmental history of Philadelphia, Baltimore, and Alexandria, three ports engaged in land reclamation from tidewater rivers, this paper considers how riparian land-making altered human-estuarial relationships. In so doing it also considers the divide between precontact and historical archaeology, advocating for a more holistic view of environmental pasts to contextualize contemporary relationships with our estuarial shores.

**Cohen, Mark (SUNY Retired)****[76]***Explaining Incipient Agriculture*

A compound theory of the origins of agriculture is offered based on the assumption that a proposed explanation must match the (worldwide) distribution of multiple independent adoptions of the new economy. Local explanations cannot suffice nor can popular discussions of "big men" or feasting. The theory offered builds from demand side economics, human behavioral ecology, analysis of post Pleistocene climate change, and descriptions of Mesolithic (or Archaic) economic sequences. Many years retired, I am soliciting help in updating my information and ideas.

**Colaninno, Carol (Southern Illinois University, Edwardsville), Emily Beahm (Arkansas Archeological Survey), Carl Drexler (Arkansas Archeological Survey), Shawn Lambert (Mississippi State University) and Cassidy Rayburn (Mississippi State University)****[136]***Opening the Gate: Practices to Promote Student Safety and Inclusivity at Archaeological Field Schools*

The archaeological field school often serves as a gatekeeper for some students to advance in the field, while hindering or preventing others from gaining opportunities and lasting careers. We investigated field school context and structures, pedagogical and inclusivity practices, and sexual harassment and assault policies among archaeological field schools in the United States. Our research methods for five case studies include interviews with field directors and participating students and pre- and post-field school surveys with field school participants. Results from these investigations suggest that field school directors have developed varying strategies to foster inclusive field school learning environments, ranging from more traditional to innovative approaches. We identified the approaches that students perceive as effective and areas where students need additional support to understand how policies and practices affect them and their safety. Based on our analysis, we propose strategies to improve field schools to make them safer and more inclusive in our broad effort to contribute to the diversity of students and professionals engaged in archaeology.

Colaninno, Carol [159] see Rayburn, Kathryn

**Cole, Kasey (University of Utah)****[47]***Climate and Human Population Impacts on Holocene Artiodactyl Abundance and Distribution in Northeastern California*

Artiodactyls (e.g., mule deer, pronghorn, and bighorn sheep) were important to past human populations in northeastern California. Archaeological artiodactyl abundance data is often used to understand past hunting and land-use behavior and related changes in human behavior, including settlement patterns, technological change, large-scale resource intensification, and anthropogenic resource depression. Most notably, the latter can be linked to increasing human morbidity and mortality, osteoarthritis, and interpersonal violence. Few studies, however, couple past climate records and proxies of human population density with zooarchaeological estimates of artiodactyl abundance to evaluate the drivers of change over time. Here I evaluate how trans-Holocene climatic variability and inferred human population density impacted artiodactyl abundance and distribution in northeastern California using modeled paleoclimatic reconstructions, distributions of radiocarbon dates, and faunal data representing more than

50 archaeological sites and >100,000 faunal specimens from published zooarchaeological reports. The results offer a regional perspective on how ecological and anthropogenic drivers impacted artiodactyls and the landscape, which has wide-ranging implications for understanding past human hunting and land-use practices in northeastern California, particularly related to interpersonal conflict and territoriality.

**Coleman, Wendi (Graduate Center, City University of New York)**

[33]

*Pinnipeds at Alluitsoq Fjord: A Zooarchaeological Investigation*

[WITHDRAWN]

**Collard, Mark (Simon Fraser University) and Kimberly Plomp (Simon Fraser University)**

[169]

*A Case Study Illustrating the Potential for Synergy between Paleopathology and Evolutionary Medicine*

The goal of this paper is to illustrate the potential for synergy between paleopathology and evolutionary medicine. We do so with a case-study that concerns two acquired spinal conditions that are often found in skeletal populations from archaeological sites—intervertebral disc herniation and spondylolysis. We begin by outlining the main ways in which the human spine differs from those of our closest living relatives, the great apes. We then review evidence that suggests there is a link between spinal and vertebral shape on the one hand, and acquired spinal conditions on the other. Next, we discuss recent studies that not only indicate that intervertebral disc herniation and spondylolysis are associated with vertebral shape, but also suggest that the pathology-prone vertebral shapes can be understood in terms of the shift from quadrupedalism to striding bipedalism that occurred in the course of human evolution. Subsequently, we place the aforementioned findings under an umbrella hypothesis, which we call the Evolutionary Shape Hypothesis. This hypothesis contends that individuals differ in their propensity to develop different acquired spinal conditions because of differences in vertebral shape that relate to the evolutionary history of our species. We end by outlining some potential future research directions.

**Collard, Mark (Simon Fraser University)**

[149]

*Chair*

Collard, Mark [149] see Beller, Jeremy

Collard, Mark [57] see O'Brien, Michael

**Collazo López, Julissa (Syracuse University)**

[44]

*Gender, a Not So Visible Traveler: Imperial Strategies on the Imposition of Gender Roles in Early Spanish Settlements in the Americas*

This paper focuses on the study of the imposition of gender through processes of gendering and production of colonial subjects in early Spanish towns in the Americas. The identification of said processes promoted by the Spanish regime is carried out through the analysis of literary sources, artwork, archaeological collections, among other data. The diversity of evidence is analyzed to research the multiplicity of gendered performances of colonial subjects enacted in the Spanish colonies. How were individuals expected to behave and carry themselves through daily life? This variability will be compared to gendered expectations in the Iberian Peninsula. Said colonial context is an ideal milieu to evaluate material gendered performances. The trial-and-error or nature of improvisation during the initial steps of the colonial endeavor proved to be an adequate space for individuals to either act, from within, in favor or against Spanish Iberian gender expectations. Exploring the gendered dimension of life and gender boundaries in colonial contexts makes possible the reevaluation of long-standing assumptions about the nature of gender, household organization, and early Spanish colonial culture. This presentation is part of a broader dissertation project.

Collazzi, Charlene [113] see Fernandez, Rachel

**Collins, Angela**

[52]

*Unseen Attributes of Mill Creek ceramics: pXRF and Petrographic Analysis of 13PM7*

Ceramics collected from the Joy Creek Major site (13PM7) were analyzed with a portable X-ray fluorescence (pXRF) machine and a polarizing microscope to identify predominate compositional patterns in paste and temper. Circumstances allowed for the comparison of results between two types of pXRF equipment that will enhance our understanding of the applications of this technology to ceramic collections. This study then compares these compositional patterns with results from contemporaneous archaeological sites in the region and surrounding areas to address questions of ceramic manufacture and cultural interaction while exploring possible influences from Cahokia. Combined with stylistic attributes, these internal characteristics of 13PM7 pottery may help elucidate not just locations of ceramic manufacture, which is indicative of trade and interpersonal interaction, but also ideological dimensions.

Collins, Angela [52] see De La Garza, Mary

**Collins, Lori (University of South Florida), Travis Doering (University of South Florida), Thomas Penders (Cape Canaveral Space Force Station) and Konnie Wescott (Argonne National Laboratories)**

[24]

*Linking Lives above and below the Ground: Using Terrestrial Laser Scanning, Imaging, and Geospatial Mapping to Preserve and Manage Historic Cemeteries and Settlements on an Active Military Installation*

Geophysical prospection, especially ground-penetrating radar (GPR), is often considered as the first or singular method of choice for cemetery documentation, but historical cemeteries and burial sites are often connected to broader landscapes, settlements, and people that require changeable scales of consideration. Using an integrated digital documentation and spatial mapping approach, we combine the use of 3D mapping and imaging along with geophysics and traditional historical investigative approaches at eight historic cemeteries and burial sites on what is today the Cape Canaveral Space Force Station. Mapping and imaging data collected were brought together in a geographic information systems (GIS) structure, with web-based application deliverables that promote a broader understanding of historic settlements and place. Management and public interfacing visualization tools using 3D and web-based virtual tours provide a means to share and explore historic cemeteries in a way that promotes preservation and continuity of social memory of place, people, and the past. Because these cemeteries are part of a dynamic and changing military installation, these documentation strategies offer new ways to integrate resource management and planning along with promoting stewardship and public engagement.

**Collins, Ryan (Dartmouth College) and Travis Stanton (University of California, Riverside)**

[34]

*Unity among Outliers? Toward a Typology of Formative Northern Lowland Maya Monumental Complexes*

In *The Origins of Maya States*, Loa Traxler and the late Robert Sharer call attention to an outstanding gap in research on the development of complex urban society in Eastern Mesoamerica. Specifically, they argue that early and extant models generally treat the Northern Lowlands of the Yucatán Peninsula as peripheral or secondary to the urban development of Central Lowland Maya cities in the first millennium BC. Extensive research on Middle and Late Formative occupations of the Northern Maya Lowlands now challenges these early assumptions, with research at Yaxuna, Komchen, Paso del Mancho, Xtobo, and Yaxhom, to name a few. Yet, one notable aspect of settlements across the Northern Lowlands during the Middle Formative is the diversity in architectural forms. This paper is a broad attempt to better understand and define the monumental complexes of the Northern Lowlands during the Middle and Late Formative and establish the groundwork for a potential typology. Because monumental architecture remains essential as a marker of social identity, shared culture, and heritage, models of trade, religion, settlement size, and sociopolitical factors will be evaluated. Doing so will better contextualize the development of Northern Lowland centers and their broader connections in the Maya world.

**Collins, Ryan (Dartmouth College)**

[34]

Chair

**Colonese, André Carlo (Universitat Autònoma de Barcelona), Alice Toso (Universitat Autònoma de Barcelona), Krista McGrath (Universitat Autònoma de Barcelona), Thiago Fossile (Universitat Autònoma de Barcelona) and Marjolein Admiraal (University of York)**

[64]

*Once upon a Time . . . There Was an Ocean: Advancing Marine Historical Ecology through Archaeology*

In 2017 the United Nations established the Decade of Ocean Science for Sustainable Development that is taking place from 2021 to 2030. The decade has been created to meet the imminent need for expanding our understanding of the changes taking place in our oceans, as well as the best ways to preserve and restore sustainable practices. Ocean science has made great progress over the last century; however, a long-term perspective of the anthropogenic footprint on oceans is still largely missing. Marine historical ecology, which incorporates several different disciplines, has emerged in the last two decades to address some of this gap. Here I present TRADITION, an ERC-Consolidator Grant funded research project (European Commission) that is currently assessing the long-term development of small-scale fisheries in Brazil, and their legacy to present day marine ecosystems and food security in the region. I focus on the archaeological component of our project and discuss how TRADITION is advancing marine historical socio-ecology in the southwestern Atlantic Ocean. Archaeology offers a unique window into the past of local traditional knowledge, a key concept to biological and environmental conservation, as well as sustainable development.

Colonese, André Carlo [63] see Admiraal, Marjolein

**Coltman, Jeremy (University of California, Riverside) and Travis Stanton (University of California, Riverside)**

[128]

*Glimpses of the Sun: The Iconographic Program of Structure 6F-68 at Terminal Classic Yaxuna*

The Terminal Classic constituted a period of immense change in the Northern Maya lowlands. Aside from ceramic chronologies, these changes can also be marked by art and architecture. While Yaxuna is not necessarily known for a large corpus of iconography, relief panels and elements of the upper and basal façade of Structure 6F-68 reveal the most comprehensive iconographic program known for the site. While some of these elements can be found in the Puuc region, others are more closely related to neighboring Chichen Itza and may reflect changes taking place during this transitional period that focus on a warrior cult closely related to solar ideology. In this paper, we will revisit the iconographic program from Structure 6F-68 and what it can tell us about the changes happening during this important period in northern Yucatán around the time Chichen Itza was founded as an urban center.

**Colwell, Chip (SAPIENS)****[195]***Discussant***Comstock, Aaron (Indiana University East), Christina Emery (Archaeological Research Institute), Logan York (Archaeological Research Institute) and Marcus Schulenburg (Archaeological Research Institute)****[114]***Developing a Multivocal, Sustainable Land Stewardship Plan for Archaeological Sites: A Case Study from the Archaeological Research Institute, Lawrenceburg, IN*

In the American Midwest, farmers tend to be hesitant to notify authorities that there is an archaeological site on their property since many believe they will be told to cease cultivating due to the presence of artifacts or burials. This perceived threat to agricultural livelihood creates a divide between farmers and archaeologists, who seek to document, understand, and preserve archaeological remains, many of which are found in today's farm fields. Most importantly, in these situations the perspectives of Tribal members are rarely, if ever, included into the study and preservation of archaeological sites, an exclusion that perpetuates a tragic colonial legacy. This project reflects a template for bringing together these stakeholder communities into a mutually beneficial and ultimately sustainable solution to preserve the Guard site, the remains of a Fort Ancient village near Lawrenceburg, Indiana. By working with Tribal colleagues, the Indiana Department of Natural Resources, local farmers, and the Lawrenceburg community, we developed, implemented, and are documenting a new landscape model. This model incorporates respectful commemorative gardens, minimally invasive cash crops, and a native species pollinator compartment to transform an agricultural field that was slowly destroying a unique precontact site into a sustainable, respectful, stewarded landscape.

Comstock, Aaron [20] see York, Logan

Conard, Nicholas [85] see McCartin, Madison

Conard, Nicholas [16] see Mentzer, Susan

Conard, Nicholas [85] see Wong, Gillian

Condon, Peter [24] see Wurtz Penton, Michelle

Cone, Bridget [161] see Stewart, Jalynn

**Conger, Megan (University of Georgia)****[223]***Can Chronology Colonize the Past? A Sixteenth-Century Iroquoian Example*

Chronological tools which rely on the presence or absence of European-manufactured items on Indigenous archaeological sites are ubiquitous throughout northeastern North America, and are often the only dating method used on sites believed to have been occupied during the sixteenth century. While the presence of these items, such as copper-alloy metals or glass beads, is not taken to represent the direct presence of European people, entrance into European economic and social spheres of influence is implied. I argue that conceptualizing European-manufactured items as both temporal markers and settler proxies overemphasizes the origins of the objects, and minimizes the social contexts in which they were used, transformed, and discarded by Indigenous people. This not only decenters Indigenous social, political, and economic processes in our explanations of past phenomena but also overrepresents European presence and influence at the time, effectively "colonizing" the archaeological narrative itself. Radiocarbon-based chronologies from sixteenth-century Wendat, Tionontate, and Attiwandaron sites in southern Ontario, Canada, serve as a case study illustrating one solution: a shift away from material-based chronologies.

**Conger, Megan (University of Georgia)****[223]***Chair*

Coningham, Robin [218] see Strickland, Keir

**Conkey, Margaret****[58]***Discussant*

Conklin, Beth [87] see Tung, Tiffany

**Conlee, Christina (Texas State University)****[82]***Reinhabiting Nasca: Challenges and Opportunities in a Period of Instability (AD 1200–1450)*

The political system of the expansive Wari state broke down by AD 1000 and caused ripple effects throughout the Central Andes. In Nasca, a river drainage in south coastal Peru that was colonized by Wari, a drought coupled with the Wari collapse probably led to the abandonment of much of the region. The disruption was severe enough that Nasca was not significantly occupied until 200 years later. Because of the length of time after abandonment, this was not a period of post-collapse transition or reorganization but instead a time of (re)inhabiting the land and establishing new types of societies. The changes evident in social, political, economic, and religious organization seem to be the result of immigration of people from highland regions who brought in new traditions. The highlanders may have encountered a small remaining Nasca population and an influx of people from other coastal valleys. In this period of instability, new opportunities and challenges existed as a greater diversity of people lived in this region, which can be seen in evidence of violence, defense, more heterarchical political structures, a focus on community based economic activity and exchange, and varied religious practices.

Conlee, Christina [41] see Bagwell, Elizabeth

Conlee, Christina [129] see Vaughn, Kevin

**Conly, Caitlin (University of Notre Dame), Mark Schurr (University of Notre Dame) and Deniz Kaya (University of Notre Dame)****[38]***Human Diet at Provadia-Solnitsata: Evidence from Stable Isotopes*

The Chalcolithic (4700–4350 CE) site of Provadia-Solnitsata in Bulgaria was a fortified settlement that grew wealthy by producing and trading salt. The regional salt trade is thought to have provided the wealth seen in burials of the Varna culture. Human and animal carbon and nitrogen stable isotope ratios are used to examine variation within human diets. The extent of dietary variation can be used to investigate questions such as whether the site's inhabitants were recruited locally or from a wider region, or whether there were differences in diet based on status or gender. Comparison of human and animal diets provides information about diet quality and the use of domesticated animals.

**Connelly, Clare (National Park Service)****[184]***Working with Our Tribal Partners to Document Fossil Cultural Resources*

Over the past several years, thousands of fossilized human and megafauna footprints have been found within White Sands National Park. From these prints, scenes of people interacting with each other as well as with the megafauna can be seen. Throughout the park, prints show megafauna such as mammoth and giant ground sloth stepping on top of human prints and the human prints crossing over the megafauna prints. The park has had the great privilege of working in consultation with many partner Pueblos and Tribes to document and preserve the trackways and their stories. Through this partnership, we have also developed new interpretive materials to bring these incredible resources to the public and educate visitors on their importance. This partnership has provided invaluable insight and the opportunity to promote the tribal perspective, which in turn allow for better resource management and a fulfillment of the park's mission.

Conner, Weston [204] see Carter, Benjamin

**Connolly, Tom and Robert Kentta (Confederated Tribes of Siletz Indians)****[131]***Awakening a Legacy: Shell Middens on the Oregon Coast*

Prior to Euroamerican contact, the North Pacific coast of North America was one of the most densely populated areas of the continent. Within the borders of the modern state of Oregon, this fact is largely lost to public awareness due to what one researcher has referred to as “the speed and effectiveness of the near total genocide and political marginalization” of the area's Natives due to catastrophic (>90%) epidemic mortality and violent encounters with colonizers (Tveskov 2007:436). This erasure has continued, with the systematic destruction of once extensive shell middens—monuments marking former ubiquitous villages—by shell mining (principally for road surfacing material) and development. Field surveys and comprehensive studies, and active archaeological work along the Oregon coast, are reinforcing the fact that the precontact Native population along the Oregon coast was unusually large and dense; these efforts are beginning to fill what one Native scholar (Wasson 1994) referred to as Oregon's cultural “Black Hole.”

Connolly, Tom [18] see Zimmermann, Mario

**Conrad, Grace and Metin Eren (Kent State University)****[57]***A Comparison of Clovis Stone and Bone Point Target Penetration*

People utilizing Clovis technology produced distinctive stone and bone projectile points. While resource availability likely contributed toward the Clovis use of one material or another, artifact function may have also played a role. Here we present a ballistics experiment on the relative target penetration ability of replica Clovis bone versus stone points. Our results have implications for hunter-gatherer technological organization, and speak to the costs and benefits of prehistoric use of different raw materials.

**Constan, Connie (University of New Mexico)****[207]***Historical Ecology and Archaeology in the Greater Yellowstone Ecosystem*

This paper examines how historical ecology can be used as a baseline for a cultural resource survey strategy for the west zone of the Custer Gallatin National Forest in southwestern Montana. The Custer Gallatin National Forest is part of the Greater Yellowstone Ecosystem and surrounds Yellowstone National Park in Montana. Several paleo-ecological studies have been conducted in the Greater Yellowstone Ecosystem by earth scientists and can be applied, via historical ecology, to archaeological contexts. Historical ecology is not limited to the precontact period and also can be incorporated into survey strategies for historic properties. This multidisciplinary approach will broaden the applicability of cultural resource inventories as data gathering mechanisms across program areas. One timely example is the listing of whitebark pine (*Pinus albicaulis*) as a threatened species under the Endangered Species Act. Whitebark pine was an important food source for indigenous groups during the precontact period in the Greater Yellowstone Ecosystem. Understanding historic environments and human usage of whitebark pine could contribute vital information to management decisions. The potential locations of whitebark pine now and in the past could be incorporated into both cultural resource survey plans and landscape treatment units centered on conservation of this threatened species.

**Conti, Alberto, Tessa Amend and Julio Gonzalez Tepetla****[56]***Typological Dating of Playa Sites Located on the Orchard Combat Training Center*

There are dozens of seasonal playas within the 143,000 acres that comprise the Orchard Combat Training Center (OCTC), located on the Snake River Plain in southern Idaho. Several of the playas are associated with prehistoric archaeological sites. The Idaho Army National Guard (IDARNG) has an extensive cultural resources database that houses the results of their annual site monitoring program and past surveys of the training range. We aim to identify the time periods of human occupation at playas by utilizing the IDARNG's cultural resources database to assess projectile points recorded on the surface along with the presence and frequency of other temporally diagnostic cultural material. Regional typologies will be used to type and date projectile points. The results of this project will aid in developing a broader prehistoric context for the area and provide useful information when assessing sites' eligibility for the National Register of Historic Places (NRHP). Future research could take a similar approach with sites from other settings that vary in elevation and physiography within the OCTC and the surrounding area.

**Contreras, Daniel (University of Florida)****[129]***Clearing the View of the Early Horizon*

The first millennium BCE in the Central Andes is widely accepted as a period of heightened regional interaction. Some portion of that period is often referred to as an early or Chavín horizon, but there is much less consensus about exactly which span of time is involved or how long this phenomenon lasted. This paper presents the results of Bayesian bounded phase models of published <sup>14</sup>C dates associated with phases linked to the Chavín Phenomenon from associated sites spread over a wide area of the Central Andes. Compiling these >100 dates, performing chronometric hygiene, and building chronological models serves to test two assertions implicit in any discussion of an early horizon: contemporaneity and brevity. Allying local chronological models to regional questions enables investigation of regional dynamics that can take into account the single-site dynamics of the constituent elements of regional phenomena.

**Contreras, Daniel (University of Florida)****[214]***Discussant***[129]***Chair*

Contreras, Daniel [88] see Vining, Benjamin

Contreras, Daniel [47] see Wilson, Kurt

**Cooley, Delaney (University of Oklahoma) and Ella Crenshaw (Sam Noble Oklahoma Museum of Natural History)****[159]***Public Archaeology in the Wake of the Pandemic: Creating a More Accessible OKPAN*

The COVID-19 pandemic has posed unprecedented challenges that have forced education and outreach organizations to adapt to rapidly changing circumstances. With health and safety an utmost priority, the Oklahoma Public Archaeology Network (OKPAN) was forced to reevaluate our existing programming, which up to that point consisted primarily of in-person events, including archaeological skill workshops, public presentations, and classroom visits. While we were able to shift several initiatives to a digital platform, others were scaled back in favor of developing our online presence. Altering our programming has had favorable results, generating more accessible content and expanding our reach in Oklahoma and beyond. Here we will discuss the changes to the initiatives, our evaluation methods, and the resulting metrics. These results are used to inform our long-term outreach model, which we will apply as we begin to recover from the pandemic.

**Coolidge, Frederick (University of Colorado, Colorado Springs)****[146]***On the Problem of Interpreting Symbolism from Rock Art*

This paper elucidates the problem determining levels of symbolic thinking from rock art, as anthropologists often interpret symbolism in an all-or-none manner. I argue Peirce's semiotic theory is no longer adequate to distinguish between levels of symbolic thinking in

archaeology, and I offer a dual theory of symbolic interpretation. First, can the phenomenon be explained by minimal/intermediate symbolic cognition, such as the Makapanskat pebble, the Bruniquel stalagmite stone ring, the Gibraltar Neandertal Tic-Tac-Toe (hashtag) engraving, cave/rock handprints, the Blombos Cave engraved ochre, or the 64,000-year-old geometric Iberian cave figures. Second, depictive rock art forms, like Upper Paleolithic animal cave paintings, Rouffignac cave woolly mammoth engravings, and the Venus of Willendorf and similar images, represent fully immersed (modern) symbolic cognition. Examples of modern symbolic cognition predominantly appear within the last 40,000 years. This is consistent with the finding that a gene (MCPH1) that regulates brain growth was under strong positive selection and swept through *Homo sapiens* about 37,000 years ago such that it was unlikely due to simple genetic drift. The authors suspected the reproductive fitness value of the gene's phenotype may have been a cognitive advantage (among other suspicions), which has also been noted by others.

**Coon, Sarah (Purdue University), Jacob Harris (Arizona State University), Trevor Keevil (Purdue University), Melissa Torquato (Purdue University) and Erik Otárola-Castillo (Purdue University)**

[40]

*Morphometric Comparison of Human Butchery Evidence to Canid Modifications within a Bayesian Framework*

Early hominins' emergence of stone-tool use for butchery is a contested topic due to the rarity of early tool evidence. In the absence of tools, the primary trace evidence for their use as butchery implements is bone surface modifications (BSM). However, current BSM identification protocols can be subjective and may lead to conflicting identifications; for example, confusing BSM like hominin-made cut marks from butchery behavior and those created by canids. Canidae species such as *Canis (Xenocyon) africanus* are present in the African Pliocene fossil record when early tool-wielding hominins appear. Canids are known to gnaw on bones and create BSM that analysts may incorrectly identify as human butchery behavior. Consequently, canids like *Xenocyon* and modern *Canis lupus* are candidates for having created some BSM currently identified as cut marks. To mitigate this problem, 3D technology combined with modern geometric morphometrics, Deep Learning, and Bayesian inference have emerged as analytical tools to differentiate between cut marks and other BSM, including other human butchery behavior and canid gnawing taphonomy. Here, we compare wolf modifications on bone under controlled conditions against experimentally produced slicing and chopping butchery BSM.

Coon, Sarah [40] see Keevil, Trevor

**Cooper, Catherine (NCPTT), Michael Richards (Simon Fraser University), Martha Cooper (Brown University) and Johanna Schmitt (University of California, Davis)**

[198]

*Geographic and Seasonal Variation in  $\delta^{13}C$  Values of  $C_3$  Plant *Arabidopsis thaliana*: Archaeological Implications*

Archaeologists frequently rely on carbon isotope data of animal and human bone collagen to infer past climates, diets, and mobility patterns. Scientists continue to unravel the intricacies of carbon isotope fractionation in  $C_3$  plants, and use these data to inform archaeological interpretations. The data presented here contribute to the body of knowledge through examination of  $\delta^{13}C$  variance in one species of  $C_3$  plant, *Arabidopsis thaliana*, grown across five field sites in Europe over two and a half years. The five sites (Valencia, Spain; Norwich, UK; Köln, Germany; Halle, Germany; and Oulu, Finland) were chosen to represent *A. thaliana*'s natural range, and site-specific climatic data were collected for each seasonal planting.  $\delta^{13}C$  values ranged from  $-30.45\text{‰}$  to  $-24.61\text{‰}$ . Significant differences were found between  $\delta^{13}C$  signatures of *A. thaliana* plants grown at different sites, between subsequent years at the same site, and among seasons at the same site. This variability of  $\delta^{13}C$  across sites and seasons within the same species has implications for interpretation of  $\delta^{13}C$  data collected from  $C_3$  crops. Archaeologists need to incorporate an understanding of the range and variation of  $\delta^{13}C$  values that could be impacting their interpretations, including the pertinent species, geographic sources, and seasons of growth.

Cooper, Martha [198] see Cooper, Catherine

**Cooper, Zachary (University of Colorado Boulder) and David Hill**

[144]

*Evaluating a Resistance Model for Northern Rio Grande–Chaco Interaction*

Shared technological traditions embedded within social networks frequently influence the type of clay and temper potters employ. Commonalities in ceramic composition may indicate any combination of social processes (in-migration, exchange, etc.). For example, social identity is often intertwined with the land and landscape, and it is reasonable to assume that ceramics produced with local clay and temper index membership in local social networks, while ceramics produced with nonlocal clay and temper index membership in nonlocal social networks. The presence of Red Mesa Black-on-white ceramics from Late Developmental period sites located in the Tewa Basin in North Central New Mexico has been interpreted as either an indicator of material exchange with or in-migration from communities associated with the Chaco regional system, located primarily in the San Juan Basin approximately 175 km to the west. However, alternative hypotheses, such as resistance or passive indifference, have not been formally assessed. Here, we evaluate these hypotheses through INAA and ceramic petrography of Red Mesa Black-on-white ceramics from LA 835, the largest Late Developmental community within the Tewa Basin. These results provide a deeper understanding of social relations and identity formation between LA 835 and Chacoan communities during the Chacoan era.

Copp, Allen [175] see Arakawa, Fumi

**Corbett, Debra (Nanutset Heritage), Robert Bearheart (Kenaitze Indian Tribe) and Norma Johnson (Kenaitze Indian Tribe)**  
[196]

*Kenaitze Indian Tribe Susten Camp: Pathway to the Future*

The Kenaitze Indian Tribe and the US Fish and Wildlife Service, joined by the US Forest Service a few years later, began a cooperative culture camp in 1994. Susten Camp was created by the tribe's cultural heritage director, Alexandra Lindgren, as a way to teach tribal youth about their heritage and history. The camp emphasized sobriety, traditional values, and knowledge, with archaeological fieldwork serving as the vehicle for teaching history and culture. Five to 15 youth ages 12–18 participate every year. Susten Campers conduct archaeological surveys, record sites, evaluate historic cabins, and excavate historic and prehistoric sites under the guidance of archaeologists. They have analyzed artifacts and soil samples and given presentations to family and friends. Campers now receive high school. With a year off for COVID, the tribe is accelerating development of Susten Camp with goals to broaden educational opportunities for tribal youth, including offering high school and college credit for participation. The tribe is currently developing culturally appropriate year-round tribal archaeology programming.

**Cordell, Ann (Florida Museum of Natural History), Neill Wallis (Florida Museum of Natural History) and Thomas Pluckhahn (University of South Florida)**

[39]

*Final Report on Ceramic Petrography of Woodland Period Swift Creek Complicated Stamped Pottery in Florida and the Lower Southeastern United States*

Swift Creek Complicated Stamped pottery from the lower southeastern United States is a premier material for systematic study of Woodland social interactions. Unique paddle stamped designs are often found on pottery at multiple sites, lending detail and spatial resolution to social connections. Petrographic analysis of Swift Creek pottery was undertaken as part of a research program that integrated materials analyses, including NAA, digital imaging of paddle stamp designs, technological analysis, and absolute dating, to identify patterns of social interaction. Two hundred and seventy-one pottery thin sections were analyzed from 50 sites across Florida and Georgia, dating AD 200–800, along with 148 comparative clay samples. This poster focuses on the now completed petrographic analyses, which documented 11 gross “temper” categories and seven matrix/petro-fabric or clay resource groups. Most of these categories are well represented in the sampled clays. Preliminary integrative results indicate that interactions were geographically extensive. Pottery manufacture was mostly local within northern regions, which encompass large ceremonial centers. Swift Creek pottery at southern sites contain an abundance of nonlocal vessels, especially at burial mounds. For the most part, conclusions regarding manufacturing origins based on petrographic and NAA data complement each other but also point to regions needing further sampling.

**Cordell, John (University of Iowa Office of the State Archaeologist)**

[52]

*Birds from 13PM7*

The archaeological assemblage of avifaunal remains from 13PM7, a Big Sioux phase Mill Creek site, has been analyzed following Donna H. Scott's 1972 master's thesis, “Analysis of Avifauna from Five Sites in Northwestern Iowa.” Scott's sites include four Mill Creek locations (13CK15, 13CK21, 13OB4, and 13PM4) and one Great Oasis site (13PM25), providing comparative data for both Big Sioux and Little Sioux phase contexts. Identification of the birds from 13PM7 was facilitated by use of the comparative bird bone collection at the University of Iowa Office of the State Archaeologist (OSA) and the identified birds from Scott's work curated at the OSA. A second analysis of bird bones also curated at the OSA was additionally considered (Excavations at the Phipps Site (13CK21): New Perspectives on Mill Creek Culture [Fishel 1995]) with the 13PM7 findings used to evaluate Fishel's findings.

Corominas Sustach, Fabiola [224] see Palacios Prado, Nicolas

Corrales, Germán [167] see Giraldo Tenorio, Hernando

**Corrales-Ulloa, Francisco (Museo Nacional de Costa Rica) and Adrián Badilla-Cambronero**

[167]

*Offerings and Memory: The Funerary Structure 1 at Finca 6 Site, Diquís Delta, Costa Rica*

Excavations of a funerary mound at Finca 6 site, Diquís delta, southeastern Costa Rica, allow us to comment on the prolonged use of ceremonial places. The artificial mound with dimensions of 7 × 2.3 m and 0.6 m in height was built with cobble stone walls, close to residential areas and fields with stone spheres. It presented inside only two metate fragments, faunal remains, and few dental remains of infants, due to poor bone preservation. The mound was then “sealed” with a stone paved covering. The area would have remained a ceremonial location as people returned to it to place ceramic and lithic offerings (179 artifacts) and, possibly, other burials. The presence of vessels with carbon residues, chunks of resin, faunal bones, and charred seeds suggest rituals associated to the placement of the offerings. The distribution of “killed” ceramic vessels, some of them foreign, at various levels above and far from the structure, seems to indicate that although memory of the place persisted, the exact location could have been lost. The <sup>14</sup>C dates obtained from internal and external sectors of the structure indicate a prolonged use of almost six centuries (approx. AD 880–1450), perhaps related to the worship of ancestors.

**Correa, Letícia (University of São Paulo) and Astolfo Araujo (University of São Paulo)****[187]***Lithic Variability in an Ecotone Area: The Case of São Paulo State*

A database was created for São Paulo State (SE Brazil) in order to map the dispersion of lithic sites in an area that is little known, although much explored by the CRM. The results showed that this area presents a cultural variability greater than expected. At the same time, São Paulo State is located in a transition area between rainforest and savanna, different from neighboring states. This environmental configuration, together with the artifactual variability, was then tested from the point of view of two theoretical approaches: Processualism and Cultural Transmission theory. If cultural variability could be related to specific biomes, then we could understand it as a result of cultural adaptation following the tenets of processualism. On the other hand, if this correlation does not exist, then it would be necessary to consider that this variability could be better explained considering cultural transmission processes. This is the first effort to understand the prehistoric occupation of the area and we hope that our results would be helpful to redefine concepts misused in this portion of the country.

Cortes-Rincon, Marisol [62] see McFarland, Jeremy

Cortes-Rincon, Marisol [96] see Rutherford, Cady

Cortés-Sánchez, Miguel [98] see Simón-Vallejo, María

**Corwin, Travis****[100]***Discussant***Cory, Mackenzie (Indiana University)****[138]***Play as Survivance, Play as Agency: Toys at the Intersection of Indigenous and Feminist Archaeological Paradigms*

Gerald Vizenor's (White Earth Ojibwe) framework of Survivance shifts the focus of literary and artistic critiques from reactive, colonial lenses of dominance and victimhood and toward proactive, pan-Indigenous lenses of resistance and creativity. In recent years, practitioners of Indigenous archaeology have increasingly turned to Vizenor as a means of interpreting and communicating the materiality of the archaeological record. In this paper I attempt to synthesize Survivance-based Indigenous archaeological paradigms with feminist paradigms on the archaeology of childhood. I do so by examining interactions between Blackfeet, Cheyenne, Crow, Dakota, and Lakota children, their peers, and their toys while in the US residential school system prior to 1930. Drawing from a combination of archaeological, historical, and ethnographic research as well as the biographically informed body of literature by Indigenous authors, I suggest that toys, especially those related to domestic play, served as vital components in the preservation and transmission of both Indigenous culture and Indigenous children's culture despite colonization, not in reaction to it.

Cossio, Roger [87] see Lemuz, Carlos

**Costin, Cathy (California State University, Northridge)****[89]***Seeing Mind-Altering Substances and Practices in the Archaeological Record*

Although archaeologists and anthropologists long tied the quest for altered states of consciousness in non-Western and nonindustrial societies to "shamanic" practice, research across many fields demonstrates that this practice is likely rooted in a pan-human drive. Moreover, research demonstrates that there are no bright lines between the therapeutic, psychological, and spiritual uses of substances with psychoactive properties. Archaeological studies of these practices have the potential to demonstrate—counter to the negative messages promulgated during the decades-long "war on drugs"—how the culturally structured and controlled use of neuroactive "entheogens" and "medicines" strengthened individuals, social groups, and societies. In this paper, I provide a brief overview of the state of the field and a brief example from my own work on the Formative period of the north coast of Peru

**Costin, Cathy (California State University, Northridge)****[89]***Chair*

Costin, Cathy [89] see Domnauer, Colin

**Costion, Kirk (Mesa Community College) and Monika Barrionuevo Alba****[194]***Community Reorganization and Ancestor Veneration in a Newly Colonial Landscape: An Offering to a Disturbed Huaracane Ancestor at Yahuay Alta during the Early Middle Horizon (~AD 600–800)*

This paper will describe the contexts of a burial discovered during the 2006 excavations at Yahuay Alta; a Huaracane settlement located on the upper margins of the middle Moquegua valley. This settlement had both Formative period and early Middle Horizon occupations. Formative period contexts consist of traditional small round or semicircular domestic structures constructed of organic materials and the Middle Horizon context consist of rectilinear structures with stone foundations and walls. This change in domestic

structures suggests that there was a reorganization of the site during the early Middle Horizon when the valley was colonized by the Wari and Tiwanaku. Excavations in Unit 6 encountered a burial that appears to have been originally interred within a circular structure with a hard clay floor during the Formative period and was then disturbed during the reorganization of the settlement. When this disturbance occurred, large stones were placed on top of the burial and a burnt offering was made on top of these stones before burying them. This paper will discuss how this context demonstrates the importance of venerating and remembering traditional ancestors in this Huaracane community during a time of dramatic change brought on by colonization of the region.

**Costion, Kirk (Mesa Community College)**

[194]

Chair

**Costopoulos, Andre (University of Alberta)**

[148]

*A Post-journal Academic Publishing Landscape*

The post-journal academic publishing landscape exists already, but the structure of academia has not yet adjusted to it. I will discuss the impact of so called preprints and post-publication review (i.e., discussion) on the structure of academia and academic labor, using archaeology as a case study.

Cothren, Jackson [122] see Davis, Dylan

Coulson, Sheila [149] see Nash, David

**Countryman, Jamie (University of Chicago), Gregory Zaro (University of Maine) and Ante Blace (University of Zadar)**

[126]

*Feral Fields of the Eastern Adriatic*

How do we identify ancient fields and farming systems in landscapes that have been continuously cultivated, in changing and dynamic ways, over thousands of years? Across Mediterranean Europe, drystone field walls, terraces, and cairns are common features that attest to generations of working the land for agriculture. While often confounding archaeological objects due to complex histories of reuse, some Mediterranean field systems have been shown to date to classical antiquity and earlier. This paper works to better understand patterns and outcomes of field "recycling" through multiple lines of evidence for long-term changes in cropping patterns and agroecology in multi-millennial agricultural landscapes of northern Dalmatia, on the Adriatic coast of Croatia. We compare archaeobotanical data from the Ravni Kotari plain with documents of preindustrial land use from the 1826 Venetian cadastre, and contemporary observations of traditionally managed, semi-wild olive groves on an Adriatic island. These data show Dalmatian communities' historically shifting relationships with domesticated and wild plant ecologies. Prehistoric integration of cereal agriculture with wild forest resources, shifting to commercial-scale domesticated arboriculture in the classical period, leaves a multifaceted legacy of commercial agriculture, traditional farming, and rewilding simultaneously happening in Dalmatia today.

Courtney, Dwight [173] see Wichlacz, Caitlin

Couture, Nicole [87] see Bruno, Maria

**Covert, Alexandra (Flagstaff Area National Monuments)**

[159]

*Engaging Indigenous Young Adults through Archaeological Fieldwork within the National Park Service*

Since 2016, the Flagstaff Area National Monuments have collaborated with Indigenous young adults through archaeological fieldwork including preservation and site condition monitoring. With the guidance of archaeologists, Indigenous young adults are able to participate in hands-on archaeological fieldwork that allows for the interpretation of their own cultural heritage. Partnerships between the Flagstaff Area National Monuments and the Arizona Conservation Corps, Southwest Conservation Corps, and Ancestral Lands Conservation Corps have allowed for Hopi, Navajo, and Zuni young adults to help preserve and protect archaeological sites significant to their cultural heritage at Walnut Canyon and Wupatki National Monuments. Not only do these collaborations benefit Indigenous young adults with hands-on archaeological experience, but they also strengthen the relationship between the National Park Service and Traditionally Associated Tribes.

**Crabtree, Pam (New York University) and Douglas Campana (Retired)**

[23]

*Zooarchaeology and Urban Development at Early Medieval Antwerp, Belgium*

The development of early medieval towns in northern Europe has interested both archaeologists and historians since the days of Henri Pirenne in the early twentieth century. Recent excavations at the Burcht sites and the Gorterstraat site have shed new light on the economy and environments of early medieval Antwerp. Multiproxy environmental data have recently been published for the Burcht sites, dating to the eighth–tenth-centuries and located inside the early medieval wall. This poster will compare these data to the animal bone information from the tenth-century and later Gorterstraat site that is located just outside the early medieval wall.

Differences between the two sites, including differences in hunting and fish consumption, can shed light on changes in Antwerp's economy and environment between the eighth and the tenth centuries CE.

**Crabtree, Pam (New York University)**

[23]

Chair

Crabtree, Stefani [47] see Holt, Evan

Craib, Alexander [117] see Barlow, Robert

Craig, Oliver [63] see Admiraal, Marjolein

Craig, Oliver [186] see Quintana Morales, Eréndira

**Crary, Joseph (Independent Researcher), Stephen Germick (Tonto National Forest) and Thatcher Rogers (University of New Mexico)**

[215]

*When Pots Equal People: A Strong Case for Eleventh- and Twelfth-Century Migrations in Central Arizona*

The East Mazatzal Bajada Survey (EMBS), conducted in 1989, found high concentrations of Salado Red pottery at sites situated west of Punkin Center, between Park and Gold Creeks in the Tonto Basin. At that time, a twelfth-century migration of people from the Vosberg-Grasshopper Area into the EMBS project area was proposed. Archaeological investigations conducted over the next 25 years also identified similar high concentrations of Salado Red and other full-body corrugated pottery at sites situated on the bajadas overlooking Tonto Creek. Dental analysis of burials recovered by the Roosevelt Platform Mound Study, Tonto Creek Archaeological Project, and the Cottonwood Creek Project, correlated with Turner's Southwestern dentition study, are used to distinguish two genetically discrete populations. Furthermore, these data, together with ceramic frequency, architecture, geological, hydrological, and paleoclimatic data are used to demonstrate two migrations into Tonto Basin. The first with Red Ware in the eleventh century and the second associated with Salado Red in the twelfth century. Finally, the implications of these findings are discussed as they apply to the Tonto-Globe Area, as well as the Sinagua, Salado, and late Hohokam culture concepts.

Crass, Barbara [57] see Wygal, Brian

Crater Gershtein, Kathryn [191] see Yeshurun, Reuven

**Cremer, Petra (Dartmouth College), Jason Ur (Harvard University) and Rocco Palermo (Universita di Pisa)**

[183]

*Imperial Settlement Systems and Infrastructure: A Case Study on the Erbil Plain*

Strategies of land use and exploitation by imperial powers have developed as a topic of discussion throughout research on the premodern world, yet understanding it via a broad perspective of the landscape (and regarding the people living under imperial hegemony) requires large datasets that are difficult to obtain. Furthermore, historical records can contribute to this knowledge, but famously tend to leave out the vast majority of those affected by imperial policy and action (or inaction). In the Assyrian Empire of the Near East, deportation practices along with a reorganization of infrastructure and settlements fundamentally altered the landscape of the imperial core. The Erbil Plain occupied a significant portion of this imperial heartland. Over the eight seasons so far conducted by the Erbil Plain Archaeological Survey (EPAS), a more nuanced understanding of settlement patterns during the genesis and expansion of the empire has emerged. In tandem with this large-scale settlement data, new subsurface remote sensing data of several Assyrian sites allows for a preliminary analysis of individual settlement organization. This paper presents both EPAS's regional data and this new site-level data, bringing in historical records of the empire to further understand Assyrian settlement strategies in the imperial core.

Cremer, Petra [160] see Alperstein, Jonathan

Creel, Darrell [86] see Roth, Barbara

Crenshaw, Ella [159] see Cooley, Delaney

Cressler, Alan [102] see Schaefer, Jordan

**Crider, Destiny (Luther College)****[163]***Listening to What the Sherds Tell Us: The Legacy of George Cowgill on Epiclassic Ceramic Studies*

I was welcomed to Teotihuacan by George Cowgill as an undergraduate circa 1994. Although my intended honors project was focused on the interpretation of mural arts in the ancient city, Dr. Cowgill redirected me to archaeological ceramics. Subsequently, as one of his doctoral students, I developed an interdisciplinary approach to the study of Epiclassic and Early Postclassic pottery in the Basin of Mexico. Utilizing the combination of stylistic, technological, and compositional data I implemented a multiscale framework to analyze spatial and temporal variation of decorated pottery. Here I reflect on Cowgill's 2015 discussion on the significance of observing processes of inheritance and emulation and utilize comparative attributes of ceramic paste, vessel shape, and quality of finish and designs in which to derive the insights into regional ceramists' technological training and access to local raw materials. I provide a discussion on the range of attributes that are likely to inform us on distinguishing direct inheritance in crafting vessels from those more likely to be the result of emulation. Data from Epiclassic archaeological collections of Central Mexico, including Teotihuacan, are used to further evaluate hypotheses on networks of interaction and proposed instances of short-distance migration.

Cross, Benjamin [65] see Emery, Christina

Cross, Benjamin [65] see Polk, Sara

Crothers, George [77] see Napora, Katharine

**Crowley-Champoux, Erin (University of Southern Maine)****[42]***Cattle Lords Reconceptualized: Cattle Wealth and Exchange in Late Prehistoric Ireland*

The end of the Developed Iron Age, in the first century BC to the first century AD, the large regional centers that had come to significance declined in importance and the communities that had coalesced during this period dispersed. Once considered the "royal" sites, these seats of regional civic society had embodied social power through reiterative construction processes, feasting, and the exploitation of exotic materials. The following Late Iron Age, from the first to fifth centuries AD, lacked the hallmarks of a highly stratified society (e.g., the decline of monumentalization and lack of rich graves). One possibility that has been raised is the shift to a dispersed and more mobile society that specialized in cattle husbandry. The dispersed nature of Irish society continued through the first millennium AD, with the florescence of individual enclosed farmsteads. The importance of cattle exchange and dairy production has become a hallmark of early medieval Irish society, though there is little discussion of the mechanisms by which this system developed. This paper will explore the role of social networks, feasting, and cattle wealth in late prehistoric Irish society and their social and political consequences.

Crowley-Champoux, Erin [40] see Garrett, Zenobie

Cruz, Jorge Ezra [125] see Nuñez-Cortés, Yajaira

Cruz, Zindy [193] see Juengst, Sara

**Cruz Gil, Rafael (Cornell University)****[179]***Xochicalco as a Canvas for Criollo Nationalism: Appropriation of the Indigenous Material Past in New Spain*

Archaeology as a tool of nationalism has a long history in Mexico, showing a remarkable malleability to serve the dominant ideology or political system. Its roots lie in the creation of criollo nationalism that sought independence from Spain. By positioning themselves as the only worthy heirs of the Indigenous past while dismissing contemporary Indigenous peoples as "degenerate," criollo elites played a crucial role in building a national identity. This paper examines how these politics of heritage and identity are made manifest in descriptions of the Epiclassic site of Xochicalco. By focusing on eighteenth- and early nineteenth-century writings about the site, especially the detailed monograph written by the polymath José Alzate, I will explore how this "Orientalism in the Western Hemisphere" shaped the early stages of Mexican statehood, as well as the European and Anglo-American responses to this phenomenon. Even if this criollo ideology could be assessed as relatively short-lived due to its exclusion of most of the territory's population, it set the foundations that would later morph into the politics of mestizaje and that, to this day, define Mexico's relationship with archaeology.

**Cuevas, Mauricio (Universidad Veracruzana), Henri Noel Bernard and Gabriela Montero****[145]***Digitalizing Mazapa and La Sierra: Topographic Mapping and Other Technologies Applied to Archaeological Research in Southern Veracruz*

Within the "Proyecto Arqueológico Mazapa-La Sierra" project, the archaeometry division of the Museo de Antropología de Xalapa applied a series of technologies for the mapping, digitalization, and data processing of settlement configurations at the archaeological sites of Mazapa and La Sierra. This paper presents the fieldwork that was carried out during this collaboration, including topographic mapping, photogrammetry, and soil flotation, as well as some preliminary results. We further argue that digital technologies have a wide range of applications to archaeological research but also to current cultural heritage issues, such as

looting and site destruction. Thus, in this paper, we analyze both current and future possibilities in the field of digital and archaeometrical research applied to field projects in the state of Veracruz.

Cuevas García, Martha [59] see Ejarque Gallardo, Ángela

Culey, Jasmin [155] see Hodgskiss, Tammy

Cummings, Linda [119] see Lovis, William

Cunningham, Jeremy [225] see Pacheco, Ellen

**Curet, L. Antonio (National Museum of the American Indian, Smithsonian Institution) and Josh Torres (US Park Service) [166]**

*Changes in Settlement Patterns and Population Levels in the Ancient History of the South-Central Coast of Puerto Rico*  
Sometime between AD 700 and 900, the south-central coast of Puerto Rico saw significant environmental, cultural, and social changes. Archaeologically, these shifts include a drop in population estimates, shifts from multifamily houses to nuclear family ones and from a nucleated to a dispersed settlement pattern, changes in mortuary practices, and the appearance of the earliest ceremonial centers in the Caribbean. Traditionally, these changes have been blamed to the development of chiefdoms, where powerful leaders manipulated many aspects of society to increase and consolidate their power, prestige, and control. However, to date no unequivocal evidence for the presence of institutionalized stratification has been found in the region. This paper is an attempt to reassess the traditional interpretations and uses regional data combined with evidence obtained from the earliest ceremonial center in the region to propose alternative explanations.

Cureton, Travis [208] see Fox, Jacqueline

**Curry, Anne**

[66]

*Assessing the Impacts of Fire on Surface Artifacts*

Land managers utilize prescribed fire as a tool to clear brush and promote habitat rehabilitation. Such an undertaking, however, can endanger surface archaeological information. While there is copious information on the impact of fire on archaeological resources in woodland environments, less is available from studies in grassland environments. Furthermore, assessments of the impact of fire on historic resources are also less frequent. The experiment described in this paper addresses the potential impact of prescribed fire on lithics, ceramics, glass, and metal artifacts. Exposure to fire significantly impacts glass artifacts, while both prehistoric and historic ceramics showed some significant alterations. Lithics and most metal artifacts appear to be unaltered during a quick-moving fire in a grassland environment. Subsurface archaeological resources are also likely left unaffected by quick-moving, low-temperature grassfires, based on the simulated conditions of this experiment. In order to minimize potential damage to archaeological resources, the type of fuel load and the types of artifacts found in an area prior to treatment must be considered. This consideration is integral, or land managers risk significantly damaging certain types of archaeological resources through prescribed burning.

Curry, Anne [66] see Tsesmeli, Evangelia

**Cusicanqui, Solsiré (Harvard University), Ricardo Albuquerque (Universidad Nacional Mayor de San Marcos), Percy Garcia (Universidad Nacional Pedro Ruiz Gallo), Jose Bello (Universidad Nacional Pedro Ruiz Gallo) and Sadie Weber (Harvard University)**

[189]

*Apu Rumitiana o Colina Santa Apolonia: Memoria y continuidad cultural en la Sierra Norte del Perú (450-850 dC)*

El Apu Rumitiana (o Colina Santa Apolonia) está ubicado en el centro de la ciudad de Cajamarca. En un esfuerzo articulado con la población local, autoridades y academia. En el 2021 se realizó el proyecto de investigación arqueológica con el objetivo de recuperar la memoria de este Apu. Las evidencias materiales han revelado que la colina fue modificada, adaptada y utilizada desde el periodo Formativo (aprox. 150 aC) hasta el periodo Cajamarca Tardío (1050-1250 dC). Mostrando una continuidad en su uso sin interrupciones de factores internos o externos. En esta charla nos enfocaremos en el periodo Cajamarca Medio, finales del Intermedio Temprano y Horizonte Medio (450-850 dC) cuando el uso ritual, producción de alimentos y bebidas a gran escala aumenta considerablemente. Los restos de materiales Cajamarca evidencian, para este periodo, una intensificación de las relaciones económicas con sus vecinos a través del comercio, crianza de camélidos, acceso a recursos diversos, producción de textiles y producción cerámica caolínica con iconografía narrativa y figurativa que avocan posiblemente a las actividades culturales que se realizaban en el Apu. Estos estudios nos permitirán tener una idea más clara de este periodo y particularmente de su posición como sociedad dentro de un proceso Panandino.

**Cuthrell, Rob (UC Berkeley)****[121]***Archaeology, Historical Ecology, and Contemporary Land Stewardship*

Historical ecology has become a key field of research in guiding decisions about how to restore, conserve, and steward contemporary landscapes. However, in practice the scope of historical ecological research is often limited to times and places with reliable textual documentation. This limitation becomes a problem in places with a relatively short history of such records, such as California, where systematic data were often first recorded in the late nineteenth to early twentieth centuries, long after colonizers had effected profound changes in Indigenous land use practices and native ecology. Based on the work of a research team led by Dr. Kent Lightfoot on the Central California Coast, this paper describes how an ecologically oriented and collaborative approach to archaeology can contribute to historical ecological research and contemporary land stewardship by focusing on Indigenous ecological dynamics over the long term.

**Cutright, Robyn (Centre College)****[84]***Late Intermediate Period Borderlands, Barriers, and Buildings in the Middle Jequetepeque and Lower Chira Valleys*

The chaupiyunga, along with the eastern slopes of the Andes, has emerged as a focus of some archaeological study in recent years. As coastal states such as the Chimú extended their control into the foothills, the chaupiyunga became an arena for negotiating state strategies and local identities. The Chimú also extended their control north across the Sechura Desert into the wetter, warmer valleys of Chira and Tumbes in ways that may be even less well understood than their forays into the middle valley. This paper presents recent research at Ventanillas, a Late Intermediate period center in the middle Jequetepeque Valley and discusses the early phases of a new project in the Chira Valley. It uses analysis of public and household architecture at Ventanillas and Monte Lima to compare what we know about Chimú strategies in these ecologically, culturally, and politically distinct borderlands, consider the extent to which these areas served as barriers vs. gateways, and raise questions about local experiences of these imperial encounters.

Cyphers, Ann [201] see Arieta Baizabal, Virginia

Czermak, Andrea [29] see Santana Sagredo, Francisca

Czermak, Andrea [198] see Schulting, Rick

Dahlstedt, Allisen [17] see Baitzel, Sarah

**Dakovic, Gligor (University of Pittsburgh)****[160]***Long-Term Demographic Dynamics of Late Prehistory (5500–750 BC) in the Northern Banat Region of Serbia*

The subject of this presentation are the long-term demographic changes in the Northern Banat Region of Serbia between 5500 and 750 BC using regional settlement data collected during an NSF-funded doctoral research survey. Determining the spatial and demographic scale of late prehistoric communities of the Carpathian basin enables us to understand long-term social processes and population dynamics of the past. In order to do so, this research aims to create a dataset that goes beyond the stereotypical archaeological site and instead focuses on delineating regional settlement pattern into meaningful social units of human interaction both on local and supra-local scale. Furthermore, this enabled me to collect data on regional population increase and decline, nucleation, and centralization. The data collected suggest dramatic shifts in all the previously mentioned aspects during the late prehistory. The Bronze Age, especially during the Maros phase, stands out as a time when there seems to have been the strongest demographic growth and settlement nucleation.

Dal Martello, Rita [186] see Mueller, Natalie

**Dalmas, Daniel (University of Utah) and Jack Broughton (University of Utah)****[68]***Assessment of Faunal Composition in Osprey (*Pandion haliaetus*) Nests and Optimal Foraging Behavior at Eagle Lake, California*

Differentiating human and nonhuman deposits is quintessential for improving identification and interpretation of archaeological material. Ospreys (*Pandion haliaetus*) are a piscivorous bird with a wide a geographic range. Characterizing osprey nest deposits will aid in avoiding conflation with archaeological deposits. Fish remains collected below osprey nests from Eagle Lake, California, provide the necessary data for characterizing such deposits. Elemental abundance is dominated by large bones particularly the cleithrum, opercles, subopercles, preopercles, and interopercles regardless of prey taxa. To best understand the patterns of deposition analysis of bone counts by maximum likelihood (abcm1) is applied for estimating taxonomic abundance, simulating depositional data from observed patterns, and to account for two agents of deposition (the nest and perch). By applying the principles of central place foraging theory a better understanding of the taxonomic variation captured by osprey foraging behavior is made. Osprey follow the predictions of central place foraging taking optimal body sized prey relative to distance from the central place, in this case the nest. Having some understanding of the available fish prey for ospreys in a geographic zone will provide the necessary information to characterize their nest deposits.

Dalmas, Daniel [51] see Todd, Lawrence

**Dalton, Jordan, Bryan Núñez Aparcana (Universidad Nacional Mayor de San Marcos), Mary Avila Peltroche (Universidad Nacional Mayor de San Marcos) and Sol Donayre Pachas (Universidad Nacional de Cañete)**  
[190]

*Community Archaeology in Peru during COVID: Taking a Site-based Approach Digital*

This paper describes community archaeology projects around the site of Las Huacas in the Chíncha Valley of Peru. The site of Las Huacas was home to the powerful Chíncha polity from AD 1100 to 1570. In AD 1400, the Chíncha were incorporated into the Inca Empire and in AD 1534 were brought under Spanish colonial rule. While in general Peruvian history emphasizes pan-regional groups such as the Inca, throughout Peru multiple projects emphasize unique aspects of local history. This includes the creation of the Paseo Yortuque in Chiclayo, and projects at the sites of Mateo Salado (Lima), and Cerro Azul (Cañete) that make the archaeological site a community space. Inspired by these projects, in 2019 the Proyecto de Investigación Arqueológica Las Huacas (PIALH) began to develop Public Archaeology programs around the site of Las Huacas. With the onset of COVID, PIALH pivoted to digital formats. The majority of the content has focused on children ages 6–13 and emphasizes unique aspects of the site's history, such as the presence of a large number of balance beam scales. In order to serve the community needs, PIALH adopted both synchronous and asynchronous content. These projects provide valuable feedback for future digital outreach efforts.

Damitio, William [18] see Brownstein, Korey

**Damour, Melanie (Bureau of Ocean Energy Management), Douglas Jones (Bureau of Ocean Energy Management), Warren Wood (Naval Research Laboratory) and Leila Hamdan (University of Southern Mississippi)**  
[46]

*Exploring Deepwater Shipwreck Microbiomes in the Northern Gulf of Mexico: The Microbial Stowaways Project*

Shipwrecks have long been known to serve an important role as artificial reefs for macrofauna such as corals, crustaceans, and fish. However, recent research in the Gulf of Mexico is revealing that historic shipwrecks also influence marine microbial dispersal and seafloor biogeography. Microorganisms play a key but poorly understood role in biofilm formation, wood degradation, and metal corrosion in the deepwater environment, which influences artificial reef formation and, ultimately, archaeological site preservation. The Microbial Stowaways Project, an interdisciplinary scientific collaboration between BOEM, the University of Southern Mississippi, and the US Naval Research Lab, is exploring how wooden-hulled shipwrecks shape the dispersal of microorganisms in the deepwater Gulf. Two previously unexplored nineteenth-century shipwrecks (at 525 m and 1,800 m water depth, respectively) were investigated in 2019 to develop baseline archaeological characterizations, deploy arrays of in situ biofilm recruitment experiments, and collect push-core samples at varying distances from the shipwrecks to identify a microbiome signature (e.g., microbial taxa associated with shipwrecks, elevated microbial diversity). In addition, a machine learning component is developing a computational tool that may be used to detect where shipwrecks are present by examining microbiome data from areas lacking archaeological data.

**Damour, Melanie (Bureau of Ocean Energy Management)**

[46]

*Chair*

Damour, Melanie [46] see Horrell, Christopher

Damour, Melanie [46] see Jones, Douglas

Dani, János [2] see Riebe, Danielle

Dansie, Amy [105] see Jerrems, William

da Rocha Bandeira, Dione [63] see Admiraal, Marjolein

**Dashzeveg, Bukhchuluun (Yale University)**

[43]

*Discussant*

**Davenport, James (University of New Mexico)**

[150]

*Serving the Inka: Petrography and Communities of Practice in the Production of Inka and Ychsma Pottery at Pachacamac*

Pachacamac was the political center of the Ychsma polity on the central coast of Peru during the Late Intermediate period (1000–1470 CE) and the home of an important oracle. After conquest by Tawantinsuyu, the Inka Empire, it was transformed into a major Inka center for the region. The Inka constructed multiple state administrative and ritual structures and spaces over the existing landscape, including PUNCHAO CANCHA, the Temple of the Sun. In these places the Inka held state-sponsored rituals, including feasts, which utilized pottery in imperial styles for the preparation, storage, and serving of food and drink. Previous studies into the production process of Inka pottery revealed multiple communities of practice produced this pottery, including local Ychsma potters paying tribute to the Inka state through labor and mitmaq communities of potters who were relocated from their homelands to work full-time for the state. This section petrography is applied to a sample of 176 ceramics in Inka and local Ychsma decorative styles

from Punchao Cancha and other contexts from Pachacamac. This is done to investigate the identities of these communities of practice and evaluate their relationships with different forms and decorative styles present in the assemblage and with each other.

Davidovich, Uri [85] see Lazagabaster, Ignacio

**Davidson, Jaron, John Carpenter, Guadalupe Sánchez and Matthew Pailles**  
[176]

*Evidence for Demographic and Cultural Continuity in the Fronteras Valley*

Recent archaeological fieldwork in the Fronteras Valley of Sonora, Mexico, yielded evidence of cultural continuity from around AD 100 to 1700. This region is culturally associated with diverse groups including the archaeological cultures of Rio Sonora and Casas Grandes and ethnographic groups such as the Ópata, O'odam, and Jumano. Our results, based on <sup>14</sup>C dates, luminescence dates, and temporally diagnostic ceramics, have obvious implications for cultural continuity. Of particular note, there is a strong case for continuity in the occupation of Casas Grandes affiliated people that extends well beyond the accepted termination date for this culture in Chihuahua. The latter, protohistoric period of occupation almost certainly corresponds to a period contemporaneous with the nearby Presidio de Santa Rosa de Corodéguachi. This record of continuity contrasts with surrounding regions which are typically interpreted as having undergone major demographic upheaval through the AD 1300s and 1400s.

Davidson, Jaron [122] see Bethke, Brandi

**Davies, Benjamin (University of Utah), David Braun (George Washington University), Matthew Douglass (University of Nebraska, Lincoln), Mitchell Power (University of Utah) and J. Tyler Faith (University of Utah)**  
[204]

*Model-based Approaches to Time-Averaged Hominin Lithic Assemblages at Elandsfontein, South Africa*

The accumulation of lithic artifacts in archaeological deposits is the time-averaged outcome of a series of manufacture, use, and discard activities organized in a framework of mobility. The extent to which the character of lithic assemblages reflects socioecological relationships depends largely on the embeddedness of lithic procurement and discard within the overall movement patterns of hominins. Interpreting assemblages in these terms is made more difficult in situations where accumulation stretches over long periods, potentially encompassing a wide range of behavioral, biological, and environmental contexts. At Elandsfontein, an Earlier Stone Age locality on South Africa's west coast, spatial patterning of archaeological material suggests a link between water availability and lithic accumulations. Yet, low densities of artifacts and long accumulation periods hamper straightforward ecological interpretations. We use an agent-based simulation to assess the formation of patterning in time-averaged lithic assemblages at Elandsfontein. This work builds on previous studies with explicit consideration of the scale of movement, lithic reuse, and nonlocal lithic procurement. Simulated assemblages are generated through a range of movement and discard configurations and compared to archaeological assemblages from Elandsfontein. This clarifies relationships between landscape-scale mobility and distributed archaeological outcomes in a way that allows for comparisons across timeframes.

**Davila, Caroll (University of California, Berkeley), Ángel Iván Rivera (INAH, México; Leiden University) and Jennifer Saumur (Université de Paris I, Panthéon-Sorbonne)**  
[35]

*Sacred Narratives and Sacred Landscape in the Zapotec Region: The "Rua Bel'lia Tsia" Cave in Tagayu (San Pablo Macuiltianguis), Oaxaca, Mexico*

This paper presents the case of the Rua Bel'lia Tsia cave, in the Zapotec region of the Sierra Norte of Oaxaca. The cave depicts precolonial rock paintings interpreted after the cultural memory of the surrounding communities. Sacred narratives shed light on the meaning of the paintings, and resonate with themes embodied by an effigy vessel recently found on the same hill. To understand the sacred landscape in its archaeological dimension, different aspects are considered. First is the cultural memory: sacred narratives, Zapotec terminology, and symbolic meaning. Second is the landscape itself and its relationship with the communities with the hill, cave, river, and waterfall. And third is the archaeological record, such as the rock paintings and the ancient representation of the deity, Cociyo, in the vessel. The combination of these different aspects facilitates an interpretation of the meaning of the cave as a place of origin of humanity. Moreover, the cave is a marker of the beginning of the rains with the hill symbolizing a container of water and maize, life, fertility, and prosperity. These bonds between archaeology, linguistics, and ethnography show the relevance of interpretations drawing on the knowledge and memory of the community.

**Davila, Caroll (University of California, Berkeley)**

[35]

Chair

**Davis, Christopher (City Colleges of Chicago)**

[79]

*The Point of Having No Shadow: Amazonians at the Zenith of Prehistory*

Among America's two vast continents, preagricultural people settled early in places that sometimes seemed unnecessarily challenging or reclusive—like Telemarchay at high elevation in the Andes, or the deeply inland North American site of Buttermilk Creek. Even parts of the dense Amazon rainforest were similarly settled early, contrary to our conceptions of it being “difficult” terrain today. However, motivations among early American settlers were possibly as nuanced as the motivations of later formative communities—be it volcanic eruptions interpreted as “world trees” that led settlers to fertile soil produced by its aftermath, or comets interpreted as signposts pointing toward “divinely” determined destinations. Pilgrimages to settle in unconventional homelands was

perhaps always a motivational factor in Native American migrations. Archaeoastronomy allows us to peer back at some of these potential motivations. In Amazonia, legends of a place where the sun casts no shadow drove some early communities to forego settling in prudent, optimal locations. For them, the zenith of the sky—and what passed through it—held special significance. At night, the Pleiades too passed through the zenith long ago. When this occurred correlates with some archaic period settlements in wetland Amazonia.

**Davis, Christopher (City Colleges of Chicago)**

[79]

*Chair*

**Davis, Dylan (Pennsylvania State University), Hank Theiss (University of Arkansas), Jackson Cothren (University of Arkansas), Carla Klehm (University of Arkansas) and Kristina Douglass (Pennsylvania State University)**

[122]

*Elucidating the Pastoralist Niche on SW Madagascar Using Automated Remote Sensing*

Traditional lifeways in SW Madagascar are critically threatened by intensifying climate change and loss of biodiversity. Many communities rely heavily on pastoralism, and cattle are central to local culture, ritual, and the intergenerational transfer of wealth. In this context of increasing climate-driven impacts, it is imperative that we investigate and learn from long-term records of human adaptation and environmental change to innovate solutions for future sustainability and livelihood resilience. Remote sensing instruments play a growing role in archaeological investigations—especially of landscape-scale phenomena—and recent improvements in machine learning techniques are rapidly identifying past human activities in these datasets. Here, we report recent findings of a remote sensing analysis of pastoralist niche construction in the Namonte Basin in SW Madagascar. We combine high resolution PlanetScope imagery with Sentinel-2 imagery and train a random forest machine learning algorithm to identify landscape signatures (e.g., features and geophysical signatures) linked to cattle pastoralism in southwest Madagascar since the seventeenth century. In so doing we quantify the extent of pastoralist activities on the Malagasy landscape and demonstrate their long-term effects on local plant and soil ecologies. Overall, our project provides new methods by which to understand landscape-scale effects of pastoralist socioeconomic systems.

Davis, Earl [141] see Antoniou, Anna

**Davis, Jeffrey (Arizona State University)**

[172]

*Early Middle Preclassic (900–600 BC) Networks in the Eastern Maya Lowlands: A Preliminary Analysis*

Researchers frequently characterize the Belize Valley Maya as a socially integrated set of peer polities. While evidence shows this to be the case during the Classic period (AD 250–900), much remains unknown regarding the degree of social integration associated with the rise of Maya civilization during the early Middle Preclassic period (900–600 BC). This study documents the degree of ceramic similarity between sites in the Eastern Maya lowlands using formal network methods to explore the possibility of site connections and to investigate the incipient social and economic network structures. Pottery similarity, based on the type-variety classification method, is used as a proxy for social connections, with the resulting data allowing us to evaluate the evidence for sub-group structure in early Middle Preclassic ceramic networks in the Belize River Valley and neighboring regions of the Maya lowlands. Additionally, a sensitivity analysis is presented to illustrate the impact of missing data on the network structure.

Davis, Jordan [161] see Jones, Eric

**Davis, Loren (Oregon State University)**

[112]

*Discussant*

**Davis, M. Kathleen (Far Western), Lucas Martindale Johnson (Far Western), Kyle Freund (Far Western) and Daron Duke (Far Western)**

[206]

*Very Small Rocks: Exploring Specimen Size Limits in Trace-Element Analysis of Obsidian Flaked Stone with Portable XRF*

Archaeologists continue to push the limits of nondestructive X-ray fluorescence (XRF) analysis in efforts to geochemically source small obsidian artifacts. Building on numerous prior investigations, this study examines a statistically large sample of unmodified obsidian flakes to better understand the size threshold for acceptable precision and accuracy. Using traditional flintknapping methods, 1,200 flakes were made from three geochemical obsidian sources in the western Great Basin: Casa Diablo, Bodie Hills, and Buffalo Hills. Specimens ranged from small pressure flakes to large interior flakes and were intended to replicate the size and morphological variation typical of an archaeological assemblage. Several methods for handling the data are examined, including relative peak percentages, peak ratios, and ratios derived from calibrated concentrations.

Davis, M. Kathleen [187] see Freund, Kyle

**Davis-King, Shelly (Davis-King & Associates)****[219]***Who Wudda Thunk CRM Could Be Profitable? One Woman's Desire to Put Culture into Cultural Resource Management*

The 1970s saw the rise of public or salvage archaeology that had little, but required, formal structure. By the mid-1970s, cultural resource studies were so-named and developing, followed soon by established businesses providing CRM investigations. This paper will discuss a holistic approach to CRM in those early days, and one which embraced all of the cultural history of an area, including Native American partnerships, description of the built environment, and historical native and nonnative archaeology. It will also discuss the challenges of being a one-person shop, being a female in the business, and being largely an anthropologist/ethnographer rather than an archaeologist. It will provide some perspective on 50 years of business.

**Dawson, Tom****[127]***Spreading the Word: Public Archaeology and Climate Change in Scotland*

Many heritage sites on the Scottish coast are severely threatened by coastal processes and increasing sea levels combined with ferocious storms that have the power to destroy archaeological sites overnight. The SCAPE Trust and its partners have been recording threatened heritage with coastal communities for the past two decades. Over the years, we've experimented with new ways to present data from our excavation and survey projects. Working directly with local groups, we've helped create 3D models for websites and museums, organize photographic competitions, relocate sites for heritage centers, build experimental archaeology resources, write climate stories (inspired by Marcy Rockman and the NPS), design interpretation boards, and make short documentary films. This presentation will highlight some of our past work and share insights on how we undertook these community projects.

**de Anda, Guillermo (Instituto Nacional de Antropología e Historia [INAH]), Cinthya Campos and James Brady (CALSTATELA)****[177]***More than Smoke: Questions Arising from Incense Burners from Balamkú Cave, Chichen Itza*

The idea that the Maya burned copal incense in their rituals appears to be so well-established that few questions have been raised about incense burning among the ancient Maya. Additionally, there have been few opportunities to examine the question. Because organics rarely survive in the tropics, this assumption has gone unquestioned. During the 2018 season, the Gran Aquífero Maya Project began a multiyear investigation of the cave of Balamkú near Chichen Itza. The cave contains a large number of incense burners filled with burned material that permits a far closer scrutiny of this aspect of Maya ceremonialism. A preliminary examination of botanical material has found large quantities of charred wood. Because of the charring, identification could not be established beyond it being a conifer that may well be pine. This discovery has important economic implications because of the distance from the nearest source of pine. The implications will be discussed in this presentation.

de Balbín-Berhmann, Rodrigo [155] see Bueno-Ramírez, Primitiva

de Flamingh, Alida [68] see Thomas, Ariane

**de Groot, Beatrijs****[226]***Technology's Tangents: The Long-Term Consequences of the Spread of the Potter's Wheel in the Western Mediterranean (1000–0 BCE)*

This paper explores the dynamic between technological and socioeconomic change by focusing on the spread of the potter's wheel in the western Mediterranean during the first millennium BCE. The potter's wheel is often considered in relation to Phoenician colonialism and its various economic impacts, such as changing forms of elite consumption. However, the role of technological innovations themselves in shaping new behaviors has less been often addressed. In this talk I examine the role of potter's wheel in the development of socioeconomic transformations that culminated in the rise of urban lifeways in the Iberian Peninsula and adjacent regions. Drawing on radiocarbon methodologies, I investigate regional variation in the timing of adoption of the potter's wheel and its prevalence through the first millennium BCE. Insights from archaeometric studies are also considered to examine continuity or change in the use of ceramic raw materials alongside the introduction of the potter's wheel, providing a bottom-up perspective on the system of technological choices, logistics, raw materials, and economic contexts accompanying its adoption. In doing so I demonstrate regional variation in the impact of the potter's wheel on the organization of labor and its role in the creation of dominant consumption practices.

**de la Fuente, Guillermo (Universidad Nacional de Catamarca / CITCa, CONICET), Sergio Vera (CITCa, CONICET), Jeffrey Ferguson (University of Missouri) and Michael Glascock (University of Missouri)****[150]***Pottery Recipes in Motion: Potting Communities during Late and Inca Periods at Southern Sector of Abaucán Valley (Dept. Tinogasta, Province of Catamarca Argentina)*

The southern sector of Abaucán Valley in the northwestern Argentine region was heavily occupied during Late (ca. AD 900–1450) and Inca (ca. AD 1480–1532) prehispanic times. More than 25 archaeological sites have been identified through the landscape. One of these sites, known as Tambo de Costa de Reyes N° 5, an Inca site, presents extensive evidence of pottery production activities (kilns, wasters, overfired sherds). It was expected that Inca pottery production was more conservative than during the Late period,

mainly due to the great standardization of forms and recipes applied by Inca potters along the whole geographic territory. Following the concept of communities of potters, the main goal of this presentation is to present a broad picture of pottery production during Late and Inca periods assessing the changes and continuities perceived by ancient potters. Thus, by combining compositional (NAA) and extensive petrographic analyses, technological choices done by ancient potters are truly explored through these two prehispanic times.

**De La Garza, Mary and Angela R. Collins (Iowa Office of the State Archaeologist)**

**[52]**

*Flying a Mill Creek Site (13PM7)*

Aerial surveys with remote-piloted uncrewed systems (a.k.a. drones) were conducted at the Mill Creek village site (13PM7) in the spring of 2021. The site is located on the south bank of the Big Sioux River in northwestern Iowa. Two drones were used to conduct photogrammetric (3D) and a thermographic surveys within the site boundaries. These differing but complimentary products contribute additional information about the site both on and below the ground surface. Thermographic (IRT) technology, utilizing an infrared camera from a high vantage point, is a relatively new and underutilized remote sensing technique in archaeology, and this survey represents the first known for Mill Creek sites. Results from the thermographic analysis complement the gradiometric survey and may even pinpoint additional features or areas of interest. 3D (photogrammetric) models produced from a high-resolution camera were successful in representing variations on the landscape that provide a snapshot for site conditions on this highly endangered site as well as enhance landscape features useful for targeting future investigations

de la Peña, Paloma [155] see Hodgskiss, Tammy

**De La Puente-León, Gabriela (Purdue University), Hannah Lipps (Purdue University), Melissa Torquato (Purdue University), Trevor Keevil (Purdue University) and Erik Otárola-Castillo (Purdue University)**

**[40]**

*Mapping Early Archaeological Sites along the Central Coast of Peru*

The South American coastline has been a focus of archaeological research for more than a century. However, currently, there is a shortage of terminal Pleistocene and early Holocene archaeological sites on the central Peruvian coast. This study presents a preliminary mapping of archaeological sites dating to the Pleistocene-Holocene transition along the central coast of Peru, in particular within the Cañete region. The main objective of this research is to increase knowledge on the probability of finding early archaeological remains in this area of the Andes. We constructed a data collection protocol across the published and gray literature to achieve this objective. We included location information of early archaeological sites described in three primary data sources: (1) Peruvian cultural resource management, (2) a selected set of Frédéric Engel's publications with information regarding his research on the central coast of Peru between 1955 and 1992, and (3) remote sensing data of the Cañete Province. We then applied statistical methods such as Machine and Deep Learning and Bayesian inference to provide a probability map of archaeological locations to prospect in the future. Analyses of these spatial data will allow to increase the number of early archaeological sites within the Cañete Province.

De La Puente-León, Gabriela [40] see Miller, Davin

**de Lombera-Hermida, Arturo (GEPN-AAT, Universidade de Santiago de Compostela), Geoffrey Clark (Arizona State University), Xosé-Pedro Rodríguez-Álvarez (Universitat Rovira i Virgili) and Ramón Fábregas Valcarce (GEPN-AAT, Universidade de Santiago de Compostela)**

**[187]**

*Raw Material Constraints and the Organization of Technology: The Management of Quartz and Quartzite by the Upper Paleolithic and Epipaleolithic Foragers of West Cantabria*

West Cantabria, a territory of the Iberian Peninsula, is almost devoid of flint outcrops in the area westward into the Paleozoic region of Spain. The arrival of Cantabrian Upper Paleolithic groups, used to flintknapping and laminar lithic production technology, in a new lithological region required a reorganization of their technology. The analysis of four lithic assemblages from NW Iberia, ranging from the Aurignacian to the Final Magdalenian/Azilian, allows us to understand the role of the lithological constraints and also the technological strategies that were developed during the Upper Pleistocene. Their contextualization within other Upper Paleolithic and Epipaleolithic West Cantabrian settlement systems allows us to identify the changes in raw material acquisition, spatial fragmentation of *chaînes opératoires*, and new technical choices. These lithic data are examined in those archaeological records from a diachronic perspective that aims to understand how the alleged raw material constraints were addressed and overcome. The lithological resources were a determining factor, but other features such as mobility and exchange networks, techno-cultural templates, and the territorial implantation of those new paleolithic groups must be taken into account.

**De Lucia, Kristin (Colgate University)**

**[165]**

*Discussant*

De Santiago, Edlin [215] see Stewart, Caitlin

De Souza, Aaron [150] see Ownby, Mary

**De Souza, Patricio (Universidad de Chile) and Isabel Cartajena (Universidad de Chile)****[51]***Exploring 10,000 Years of Projectile Technologies Evolution at the Atacama Desert Highlands (South-Central Andes)*

At the Atacama Desert highlands, a chronological span of 10,000 years separates the first hunter-gatherer groups from the first pastoralist societies, on what is a well-known cultural development sequence. However, little is known about the evolution of projectile technologies along this occupational sequence, even though these were critical for the subsistence and successful adaptations of these groups. In this work, we present the first long-term analysis of projectile technologies along this cultural sequence at the Atacama Desert highlands. We have carried out metrical and morphological analysis of hundreds of lithic projectile points recovered from archaeological sites belonging to Early Archaic, Middle Archaic, Late Archaic, and Early Formative periods. Results allow us to identify specialization and diversification processes of weapons systems throughout these 10,000 years of occupations. We propose that the observed variations could be explained as adaptations to changing environmental conditions, as well to the social and economic transformations along the occupational sequence.

**Dean, Emily (Southern Utah University)****[136]***Losing My Religion? Cognitive Dissonance in Undergraduate Anthropology Students*

This paper explores the cognitive dissonance many of my students at a small university in conservative, rural Utah experience when learning about such standard anthropological ideas and theories as natural selection and human evolution, cultural relativism, and archaeological views on the populating of the Americas. I address the ways this cognitive dissonance manifests itself in the classroom, and some strategies students use to cope with new information that may challenge their existing worldviews. To do this I incorporate Institutional Review Board–approved survey data collected from introductory classes in archaeology and biological anthropology, as well as more detailed interviews conducted with senior anthropology majors and recent graduates. I conclude by considering some of the techniques I've found especially helpful when introducing students to these challenging ideas.

**Dean, Rebecca****[190]***Stuck in the Middle (of Nowhere) with You: How the COVID Disruption Brought Educational Opportunities to Rural Minnesota*

The University of Minnesota Morris is a public liberal arts college of around 1,500 students in a town of around 3,500 inhabitants in rural West-Central Minnesota, a full hour's drive from a Walmart. With university budgets the way they are, and the closest significant airport three hours away, providing students and the community a window onto the wider world of anthropology has always been a challenge. The COVID-19 pandemic provided previously unimaginable opportunities. Accommodations that had never been possible before were suddenly commonplace. Students could attend major conferences while sitting in the middle of corn fields. Anthropologists from all over the world could Zoom to our classroom or lecture series and share their wisdom. As the pandemic (hopefully) winds down, anthropology should continue to offer the accommodations that allow rural, disabled, cash-strapped, and historically excluded individuals to participate in the mainstream of the field.

**Deans, Benjamin (Central Washington University), Lisa Ely (Central Washington University), Steven Hackenberger (Central Washington University) and Breanyn McInnes (Central Washington University)****[115]***Geoarchaeological Analysis of Cultural Occupation Sites along the Hanford Reach of the Columbia River, Washington State*

Archaeological sites near rivers may be preserved through burial, altered by exposure, or destroyed through erosion. The Hanford Reach is the only remaining free-flowing reach of the Columbia River and is ideal for research into the geomorphic settings of archaeological sites along this river. In this study, we reconstructed the geomorphic history of fluvial terraces with known late Holocene archaeological sites to determine: (1) the composition of buried and surficial deposits and whether fluvial or eolian forces were the primary agents for preservation; (2) which sites might be subject to future erosion; and (3) settings most likely to host surface versus buried archaeological sites. Hydrologic Engineering Center River Analysis System (HEC-RAS) 2D modeling was employed creating inundation maps of the two largest historical floods on the Columbia River in 1894 and 1948. Identification, stratigraphic description and dating of historic slackwater flood deposits provided sedimentological analogs that distinguished fluvial and eolian deposits collected during this and prior archaeological excavations. Buried archaeological materials were encased predominantly in medium/fine sand. Identifying the geomorphic settings and processes under which sites are most likely to be buried or eroded will assist land management decisions to most effectively preserve the cultural resources of this area.

DeBlasis, Paulo [154] see Scheel-Ybert, Rita

Declet-Pérez, Mariela [125] see Rivera-Collazo, Isabel

DeCorse, Christopher [106] see O'Leary, Matthew

Dee, Gina [85] see Mathwich, Nicole

**Deere, Bobi (University of Oklahoma)****[102]***Paraphernalia Associated with Shamanism: A Look at the Tools and Evidence for Ritual Practitioners that Use Altered States of Consciousness*

What do a feathered robe, a rock face with eyes pointed to the sky, a spider tattoo, and residues of psychotropic plants have in common? This paper will look at New World archaeological evidence of ritual practitioners that used altered states of consciousness to serve their communities through divining and healing, as well as other culture specific duties.

Deetz, John Eric [182] see Agbe-Davies, Anna

**deFrance, Susan (University of Florida)****[194]***Discussant*

deFrance, Susan [67] see LeBlanc, Megan

deFrance, Susan [217] see Muñoz Rojas, Lizette

deFrance, Susan [85] see Rubinatto Serrano, Juliana

DeGeorgey, Alex [127] see Newland, Michael

**Delaere, Christophe (Université libre de Bruxelles) and Estelle Praet (University of York-WRoCAH)****[64]***Lost at Sea: Marine Plastic Pollution in the Galapagos through Contemporary Underwater Archaeology*

Plastic pollution, one of the biggest global challenges our world is facing, is so widespread that it even reaches Galapagos shores despite the physical isolation of the archipelago, threatening the environment and wildlife of this unique socio-ecosystem. By addressing the recent past, contemporary archaeology is key to understanding the origin and causes of marine anthropogenic deposits. Archaeological techniques can contribute to offer a perspective of Galapagos plastic-scape both on the shores and in marine environments. While beach collections offer an opportunity to reflect on plastic pollution by categorizing floating plastic artifacts reaching the shores, sinking artifacts can be better understood through underwater archaeology. With the sea perceived as a place of oblivion, understanding the origin of plastic is essential to tackle plastic pollution. A closer look to the artifacts found and their stratigraphic contexts is possible through underwater archaeology. This approach to material culture complements oceanographic models aiming to understand the arrival of plastics in the Galapagos Marine Reserve where the Panama, Cromwell and Humboldt currents collide. Based on unpublished archaeological data from river and lake contexts, this paper presents a method for maritime contemporary archaeology to provide a better understanding of the unseen plastic pollution.

**DeLance, Lisa (University of La Verne) and Gary Feinman (Field Museum of Chicago)****[188]***Framing Complexity: New Considerations from Formative Mesoamerica*

This paper presents new considerations of the origins and processes of emergent complexity throughout Mesoamerica as explored in the upcoming book *Framing Complexity: Vantages from Formative Mesoamerica*. This upcoming edited volume honoring Dr. Ashmore, her students, and colleagues explores the emergence of cultural affiliations, cultural identity and variability, the delicate balance between cooperation and competition, and mechanisms of community cohesion, all while framing complexity as an active process. This paper will present a three-pronged framework to consider questions of complexity including (1) social aggregation and community organization, (2) the establishment of community/ethnic identity absent conflict (cooperative ethnogenesis), and (3) key aspects of macro- and microregional variability throughout Formative period Mesoamerica. Reconsidering complexity within this framework allows archaeologists to explore the critical and yet highly nuanced differences in expression between social groups across Formative Mesoamerica.

**Delgado, James (SEARCH Inc.)****[46]***Clotilda: The Archaeology and Legacy of an Infamous Schooner*

The 1860 wreck of the schooner Clotilda, a site in the Mobile River near Mobile, Alabama, is a highly significant site as the substantially intact wreck of the last vessel known to have brought captive Africans to the United States for the intention to enslave them. Immediately after the end of its illegal voyage in July 1860, it was set afire and scuttled by its captain to hide the evidence. The legacies of the voyage include a descendant community, a number of whom live nearby in the community of Africatown. This presentation focuses on the archaeology and ongoing work to assess, preserve, and share the story of Clotilda working with and through the Alabama Historical Commission and the descendant community.

**Delgado Espinoza, Florencio****[3]***Variability on Coastal Ecuador's Early Formative*

Studies of the Ecuadorian past with few exceptions lack comparative analysis. Political barriers seem difficult to cross for understanding long-term cultural. At coastal Ecuador, the rapid change toward agriculture has been linked to the use of ceramics

and the formation of agricultural villages with spatial difference between domestic and ceremonial and or public spaces. Contrast with the process of the north coast of Peru has been noted. In this presentation new evidence on the characteristics of the Early Formative period of the Ecuadorian coast are presented with the contention that this period is very variable and that this variability is key to understanding the interactions with the north coast of Peru.

**Delsol, Nicolas (University of Florida), Jessica Oswald (University of Nevada, Reno), Brian Stucky (University of Florida), Robert Guralnick (Florida Museum of Natural History) and Kitty Emery (Florida Museum of Natural History)**

[85]

*First Cow(s): Exploring Human and Cows Migrations in the Postcolumbian Atlantic World through Ancient DNA*

Despite long-term study, the history of the introduction of cattle and their management practices in the Western Hemisphere starting in the sixteenth century is particularly complex, and there is still uncertainty around the origins and the distribution of the animals through time. Early historical studies suggest that the animals were initially introduced in small numbers in the Caribbean. From there, they would then have been brought to Mexico after the Spanish invasion of Mesoamerica. However, several genetic analyses on existing populations of heritage cattle breeds in the Americas highlight the widespread presence of an African genetic component across the continent, in addition to Iberian components. These elements suggest that the dynamics of the introduction of cows in the postcolumbian Americas is much more complex than previously thought. Our study introduces the first phylogenies of taurine matriline and patriline in the Americas using mitochondrial and Y chromosome markers. This genetic history sheds light on little known processes that accompanied the introduction of the cattle industry in the region, such as the central role of enslaved workers of African descent in the emergence of the cow ranching culture in the postcolumbian Americas.

**Demel, Scott (Northern Michigan University)**

[182]

*Who Ate the Periwinkle Snails and Ham Steaks? An Archaeological Investigation in Chicago's Chinatown*

In the fall of 2004, archaeologists, students, and volunteers from the Field Museum, DePaul University, and the community conducted archaeological survey and testing of an empty parcel adjacent to the new Chinese American Museum of Chicago. The lot, still at the original nineteenth-century street level, was over 3 feet below the modern 23rd Street level. Shovel probes yielded abundant in situ deposits, and subsequent test excavations unearthed layers of material culture and subsistence remains that reflect demographic change in this Chicago neighborhood from its beginning in the late nineteenth century through the 1911 restart of Chinatown. The hands-on archaeological project and resulting historical exhibition formed a stronger bond between Chinatown's past and present for young Chinese student participants, community members, historians, and anthropologists.

**Denker, Erika (Purdue University), Trevor Keevil (Purdue University), Melissa Torquato (Purdue University) and Erik Otárola-Castillo (Purdue University)**

[40]

*Prehistory Bites Back: Replicating Animal Bite Marks on Bone Surfaces*

Bone surface modifications (BSM) left by predators on their prey's bones can provide clues about which species were around when the prey died, how these species interacted, and how the environment affected these relationships. To discern the origins of an unknown mark in an archaeological context, one may compare it to a known one. However, it is challenging to procure marks of known origin, especially those created by animal subjects that could endanger researchers or are difficult to access (e.g., extinct species). Therefore, the community needs a reliable, safe method of extracting animal bite marks. Here we demonstrate how to manufacture gray wolf bite marks using a device, JAWS, that manipulates a gray wolf skull to simulate a bite using tension force. We then apply 3D morphometrics, deep learning, and Bayesian inference to discriminate between these and other marks. Furthermore, researchers can use JAWS to assemble catalogs of known marks that are more likely to match with unknown marks by manipulating mark variables. In conclusion, JAWS is an interdisciplinary endeavor between the fields of engineering and anthropology designed with the intention to create bite marks for statistical analysis and comparison that will help identify marks of unknown origin.

Dennany, Lynne [89] see Robinson, David

Denoyer, Allen [175] see Pflieger, Gabriella

**Dering, James (Shumla Archaeological Research and Education Center), Karen Steelman and Carolyn Boyd**

[101]

*Pecos River Style Art as a Late Archaic Period Phenomenon in the Lower Pecos Canyonlands, Texas, USA, and Coahuila, Mexico*

Texas State University and Shumla Archaeological Research and Education Center have begun a project to document and date specific Pecos River style (PRS) motifs. Initial mural production was considered a phenomenon of the arid Middle Archaic period, starting by 4500 cal BP, and persisting into the middle of the Late Archaic period. However, a recent review relegated most of the 29 dates on PRS paint to legacy status. Using new sampling protocols, three dates on PRS paint fall around 3500 cal BP, placing earlier murals near the end of the Middle Archaic and just before, or perhaps at the onset, of a brief mesic interval. Two more dates put other PRS murals in the latter part of the Late Archaic (2300–1400 cal BP) during a return to aridity. Because the Late Archaic is a period of environmental and social change, it provides an ideal timeframe for evaluating temporal variation in PRS iconography. Under what conditions does PRS pictography commence, develop, and end? This presentation establishes a context for the study of PRS mural production by reviewing current hypotheses regarding environmental, technological, subsistence, and organizational changes from the Middle-Late Archaic transition to the end of the Late Archaic.

Dering, James [101] see Boyd, Carolyn  
 Dering, James [101] see Steelman, Karen

**Des Lauriers, Matthew (California State University, San Bernardino)**

**[79]**

*Learning Landscape vs. Learning Lifeways: The Question of Legacy Adaptations in the Context of the Peopling of the New World*  
 Ideas of migrations, origins of technologies, and the adaptation of communities to changing conditions form a great part of the core research agendas in archaeology. One area where integration of these ideas has met with difficulty is the question of the Peopling of the New World. It is a logical certitude that the ways of life practiced by these migrants would have necessarily been part of their life prior to their migration and arrival. If we posit, for example, that early migrants into the Americas followed both a coastal pathway and a "maritime" way of life on their journeys southward from Beringia, then we must integrate the realization that they were already possessed of the requisite knowledge and technologies to do so. Where and when was such knowledge created? The cultural behaviors of their immediate descendants, those who created most of the early archaeological sites we discover, can provide meaningful clues as to the geographic origins and ways of life of their ancestors. It is in this way, more than simply seeking radiocarbon dates disjunct from anthropological data, that we can begin to envision a more relevant and coherent picture of how and why people first arrived in the Americas.

**Des Lauriers, Matthew (California State University, San Bernardino)**

**[79]**

*Chair*

Deskaj, Sylvia [147] see Mehmetaj, Haxhi

Després-Coulombe, Camille [109] see Gates St-Pierre, Christian

Deurell, Sara [77] see Bader, Anne

Devos, Fred [221] see Meacham, Samuel  
 Devos, Fred [154] see Steele, Riley

**DeVos, Paige and Abigail Chipps Stone (Illinois State University)**

**[186]**

*Diet, Mobility, and Identity in an Ancient West African Urban Landscape: Isotopic Analysis of Human Tooth Enamel from Jenné-jeno, Mali*

Food and identity are closely tied in Mali's Inland Niger Delta. Ethnic groups like the Bozo and Marka have historic ties to particular food production practices. This present division of subsistence strategies influences archaeological discussions of specialization at the ancient city of Jenné-jeno. In this paper we use isotopic analysis of archaeological human tooth enamel to investigate the ways individual people were living, moving, and eating in the broader Djenné region. Specifically, we investigate heterogeneity in diet and population origins at Jenné-jeno and neighbouring sites and how food and migrations shaped relationships among the broader population. Our data highlights Jenné-jeno's cosmopolitan nature, while also resisting easy classification of individuals or sites into specialized subsistence systems. However, we also see evidence of shared cuisines across individuals with differing origins. Taken together, our data helps us understand the interaction between diet, mobility, social identity, and social boundaries in this complex urban landscape.

Dharmendra, Ben [218] see Fletcher, Roland

Diaz, Luisa [29] see Pareja, Dante

Díaz, Mateo [167] see Giraldo Tenorio, Hernando

Díaz García, Mauricio [53] see McNeil, Cameron

**Diehl, Richard (University of Alabama)**

**[133]**

*Discussant*

**Diemberger, Hildegard****[51]***Reflections on the Archaeology of Paper on the Tibetan Plateau*

Paper as writing support has elicited increasing interest among scholars studying Tibetan culture. The rediscovery of manuscripts and prints that have survived the Cultural Revolution has offered many opportunities to engage with the materiality of literary artifacts. Tibetan scholars in collaboration with international experts have increasingly focused on paper-making materials, techniques, and questions of dating so as to complement information retrieved from textual analysis. This paper will focus on recent findings from Central and Western Tibet that show how cross-disciplinary collaboration can help address questions concerning the earliest stages of paper production in Tibet and technological innovations such as the introduction of printing. This paper will also reflect on the fact that this kind of scholarly interest is part of a wider process of rediscovery and preservation of Tibetan cultural heritage.

**Dierks, Zachary (University of Iowa)****[94]***Debitage and Tools: Lithic Analysis at Woodpecker Cave*

Woodpecker Cave is a Middle to Late Woodland site in Johnson County Iowa with at least three occupation layers, each of which were likely occupied during the winter months. It was the site of a University of Iowa summer field school led by Professor James Enloe from 2012 to 2018. Within these excavations a total of 2,547 lithic artifacts were found. In the 2018 excavation alone there were 319 pieces ofdebitage and 58 retouched tools. These artifacts were examined morphologically to determine possible technological usage and raw material. Raw material identification was done by cross comparison of type collection from known source locations at the Office of the State Archaeologist, Iowa City. Given the seasonal nature of the occupations, our expectation is that most tools would be taken both to the site and with the occupants as they left. The site'sdebitage will be the focus of this poster and classified into a number of categories to examine the activities and technologies in play at the site as well as the mobility of the occupants.

Dietrich, Emma [127] see Miller, Sarah

Dietz, Rune [28] see Routledge, Jennifer

**Di Giuseppantonio Di Franco, Paola (University of Essex)****[10]***Can DIGIFACTS Alter Museum Ecologies? A Talk about Sense of Touch, Affect, Authenticity, and Play*

This paper investigates the use of 3D digital and printed replicas of artifacts inside museums and how this affects the museum visit. I specifically focus on the sense of touch, which is often defined as a significant part of the heritage "authentic" experience, and discuss how tactile experiences with artifacts replicas can increase the affective affordances of the original artifacts exhibited in the glass-case. Drawing on recent studies that offer a rereading of "The Work of Art" by Walter Benjamin (1935), as well as on the "Ecology of Mind" by Gregory Bateson, I argue that the study of 3D digital replicas of artifacts should be less concerned with the preservation and migration of the aura and more focused on the regenerative power that such replicas have to emphasize the historicity of ancient artifacts. My empirical studies borrowed methods from cognitive science, to understand how people engage with digital replicas of museum artifacts. The results of these studies reinforce the idea that, while the glass-case limits a performative and emotional encounter with the artifacts, 3D digital and printed replicas can increase visitors' engagement and sense of attachment to the objects on display.

**Dillehay, Tom****[216]***The Andean Preceramic Neolithic in North Coastal Peru*

After ~9000 cal BP, South American cultures began to develop rapidly. While hunter-gatherers and fisher-gatherers occupied most of the continent, the Central Andes underwent some of the earliest domestication of plants and animals, which lead to the gradual emergence of farming, fishing, and pastoral economies. By ~8000 cal BP, permanent villages existed along the coast of Peru, especially in the north. Between 7500 and 5000 cal BP, these developments resulted in the establishment of elaborate social organization, iconography, public ritual, and monumental architecture and in proto-urban population centers. The appearance of permanent villages in highly productive resource zones, whether they were irrigated fields, camelid herds, or coastal bays, created new ways of life and new relations between members of communities. Rich environments such as the diversity and abundance of Pacific maritime foods from Ecuador to northern Chile and the adoption of exotic food crops in oases-like valleys of Peru's coastal desert account for part of these developments, but part is explained by new principles of socioeconomic and demographic organization. The major features and significance of these developments during the Preceramic or Neolithic are discussed, especially for the north coast of Peru.

**Dillehay, Tom****[84]***Discussant*

Dillehay, Tom [57] see Adovasio, J. M.

Dillehay, Tom [87] see Tung, Tiffany A.

**Dillian, Carolyn (Coastal Carolina University), Katie Stringer Clary (Coastal Carolina University), Jesse Morgan (Coastal Carolina University), Cheryl Cail (Waccamaw Indian People) and Harold Hatcher (Waccamaw Indian People)**  
**[196]**

*Collaboration with Non-Federally Recognized Tribes: The Waccamaw Indian People Exhibit at the Horry County Museum, South Carolina*

This paper outlines an innovative exhibit created as a truly collaborative effort between Coastal Carolina University, the Horry County Museum, and the Waccamaw Indian People. The Waccamaw Indian People, whose traditional lands include Horry County, South Carolina, are a state-recognized tribe with cultural traditions that reflect their unique past. This project entailed the creation of an exhibit and educational material that highlights their culture and history, which is relatively unknown to the public. Coastal Carolina University students and faculty, in partnership with the Horry County Museum and the Waccamaw Indian People, used oral histories, historical archives, photographs, belongings, and collections to build an exhibit at the museum that educates the public about the rich and diverse Native American history and culture of Horry County through community-driven interpretive text and interactive exhibits. The exhibit was designed to tell the story of the Waccamaw Indian People's past, present, and future, as they wanted it told, using narratives gleaned from interviews conducted by students, and written with an ongoing back-and-forth with tribal members to ensure that the interpretation was in line with their vision for the message, and provides a model for archaeologists and museums working with non-federally recognized tribes.

DiNapoli, Robert [19] see Napolitano, Matthew

**Dine, Harper (Brown University) and Chelsea Fisher (Washington & Lee University)**  
**[34]**

*Monumentality and Temporalities of Space at Tzacauil*

Ongoing projects have investigated the role of monumental architecture in the development of Preclassic Maya states and continue to reveal insights about the contextualized organization and significance of such architectural schemata throughout the Maya area. In this paper we investigate the relationship between residential complexes and monumental architecture at the Maya site of Tzacauil, Yucatán, which was first settled in the Preclassic period and reoccupied in the Classic period. Residents of Preclassic Tzacauil created their house-lot spaces in tandem and in association with the site's acropolis and monumental *sacbe*. Within the temporal shift between occupation periods, which was accompanied by changing conceptualizations of monumentality, uses of space, and agricultural practice, we find evidence for social and symbolic experiences of Preclassic monumental architecture at Tzacauil, as well as such architecture's effects on the landscape and notions of community. We consider the temporality of the acropolis as it was experienced in comparison with rhythms of time in dynamic house lots, suggesting an avenue for relating the symbolism of triadic groups to daily practice. We also explore the *sacbe* through the lens of infrastructure, connecting novel monumentality to patterns of movement and networks of political economy in day-to-day life.

**Dobbins, Paige [Replaced by Sean Patch] (New South Associates Inc.)**  
**[24]**

*Rediscovering Port Tampa Cemetery: A Multidisciplinary Survey of MacDill Air Force Base in Tampa, Florida*

In early 2020, efforts began to identify an unmarked, unofficial burial ground potentially located within the boundaries of MacDill Air Force Base, Tampa, Florida. This cemetery was referenced in death records as the "Port Tampa Cemetery" and is believed to be primarily associated with the African American community in Port Tampa. As the burial ground's location is not well documented in surviving records, rediscovery would likely require collaboration between historic, geospatial, and forensic science methodology. Based on this assumption, a multidisciplinary approach is currently being implemented utilizing oral history interviews, record reviews, historic aerial analysis, remote sensing, and human remain detection dogs. Though the location of the burial ground remains unconfirmed, the resulting examinations performed at MacDill Air Force Base demonstrate the value of such approaches to reconnaissance of lost cemeteries and could be applied elsewhere with similar success.

Dobney, Keith [111] see Weyrich, Laura

**Dodd, Walter (California State University, Fresno)**  
**[21]**

*Why Did Ceilings Evolve in Built Structures? An Ethnoarchaeological Lesson*

In contemporary society, we often talk about having a roof over our head. For hundreds of thousands of years, that is what humanity saw when they looked up inside their domiciles. More recently, ceilings have intervened to alter the view. This poster presents an interesting case study of modern ceiling use, and non-use, among Warihó farmers of northwest Mexico. Variability in construction and the situational contexts associated with it provide compelling reasons for why ceilings became an indispensable part of site structure.

**Doelle, William (Archaeology Southwest)**  
**[219]**

*Unfinished Business: Facilitating Synthetic Research by Expanding Access to Digital Databases*

The digital technology that helped Desert Archaeology gain a foothold and grow in the early 1980s today looks like a fossil from an ancient geologic era. Fortunately, digital databases evolved rapidly over time, and Desert Archaeology made major investments in an integrated company database. That database made the results of past research accessible for all new projects, which made synthetic research more cost-effective and feasible. As the CRM arena has grown dramatically, commitments to databases have

been highly variable. In addition, databases are generally internal to each company. Today, nonprofit Archaeology Southwest and a team of partners at the University of Arizona, Arizona State University, and University of Colorado Boulder are developing cyberSW, a regional database that will be internet accessible. The site-level component of this database is richly populated with ceramic, obsidian, and public architecture data. The intrasite component of cyberSW is progressing rapidly. It addresses the "unfinished business" of my paper title. It has the potential to make the massive amount of digital CRM data that has accumulated over the past two decades broadly accessible.

**Doering, Briana (University of Wyoming), Molly Herron (University of Wyoming) and Madeline Mackie (Weber State University)**

[116]

*Colby Revisited: Reevaluating the Chronology and Context of a Clovis Mammoth Kill Site*

The origins, diet, and traditions of the first Americans, and their impacts on local paleoecology, remain a subject of intense debate among Paleoamerican archaeologists. The Colby Mammoth Site (48WA322), near Worland, Wyoming, is one of 15 widely accepted mammoth kill/scavenge sites in North America, occupied ca. 12,800 cal BP. This Clovis-aged site was excavated by a team of researchers at the University of Wyoming in the 1970s, who tentatively interpreted the assemblage as a potential winter cache. To evaluate this interpretation, we present the results of a combined paleoecology and archaeology study. In addition to new radiocarbon dates from the Colby mammoths (*Mammuthus columbi*), we present carbon and oxygen isotopes to determine seasonality of the kill, the relationship between individual animals, and approximate mammoth mobility. Combined, new research on this important legacy collection adds to our knowledge of human-animal interaction, megafaunal extinction, and early American subsistence traditions.

Doering, Travis [24] see Collins, Lori

**Doershuk, John (University of Iowa)**

[52]

*Introduction to the Joy Creek Major (13PM7) Research Project*

This presentation introduces the context of the Joy Creek Major (13PM7) site research project that explores potential connections between northwest Iowa Mill Creek sites in the eastern Plains and Cahokia. The symposium participants are contributing to better understanding of interactions involved with the emergence of fortified villages following corn-centered agricultural subsistence-settlement adaptations. The Joy Creek Major site (13PM7), while badly damaged by flooding, provides ready access to the exposed basal portions of dozens of large Mill Creek features which have been archaeologically documented and sampled. This symposium builds on extensive recent site context and artifact analyses including gradiometry, geoarchaeological coring, drone-based thermography and photogrammetry, ceramic analyses including temper petrography and pXRF, lithics, fauna, and paleoethnobotany to consider 13PM7 within the Mill Creek culture (Initial variant of the Middle Missouri Tradition) Big Sioux phase. A suite of new AMS radiocarbon results for assays on annual plants from 13PM7 and related northwest Iowa sites contextualize emerging eastern Plains village lifeways and frame potential Cahokia interactions.

**Doershuk, John (University of Iowa)**

[52]

*Chair*

Doershuk, John [97] see Anderson, Mark

Dogandžic, Tamara [186] see Watson, Sara

**Dolan, Sean (N3B Los Alamos National Laboratory) and M. Steven Shackley (Geoarchaeology XRF Laboratory)**

[14]

*What Can Obsidian Tell Us about US Southwest-Mesoamerican Connections?*

Despite the geographic distance and vast disparities in sociopolitical scale, people in the prehispanic US Southwest/Northwest Mexico (SW/NW) and Mesoamerica interacted to some degree. People widely used obsidian in both cultural regions, but archaeologists have not used obsidian artifacts to connect the SW/NW to Mesoamerica (and vice versa). In this paper, we discuss obsidian blades recovered from Spanish-era sites in New Mexico and Arizona, and EDXRF spectrometry confirms they match the geochemical signature of one of the chemical groups of Pachuca obsidian. By discussing how SW/NW and Mesoamerican lithic practitioners organized their lithic technology, we offer reasons why prehispanic SW/NW groups did not use or trade for Mesoamerican obsidian and why the Mexican Indian allies of the Spanish brought so few obsidian blades into the SW/NW beginning with the Coronado expedition in 1540. While cacao and scarlet macaws are markers for prehispanic SW/NW-Mesoamerican interaction, obsidian is not considered an interaction marker. Instead, Mesoamerican obsidian found in the SW/NW is a time marker for 1540 and later, and it provides evidence that Mexican Indians were likely present. Using obsidian, this research expands our understanding of prehispanic SW/NW-Mesoamerican interaction and trade and new insights into the Mexican Indian allies.

**Dolmas, Lewis****[175]***Distributions of Axe Head Styles at Salado Settlements*

One of the central and most intriguing characteristics of settlements associated with the Salado phenomenon (AD 1300–1450+) in southwestern New Mexico and southeastern Arizona is the combining of material culture from Mogollon and Hohokam groups native to these southern regions with that of Kayenta immigrants from northeastern Arizona. One way this mixing can be seen is in ground stone axe heads. Southern style axe heads were made in a ¾-groove style and northern Kayenta axe heads were grooved all the way around, and Salado assemblages may include both types. In this study, I analyze the inter- and intrasite distribution of ¾-groove and full-groove ground stone axe heads to better understand the coalescence of these material cultures.

**Dombrosky, Jonathan (Crow Canyon Archaeological Center)****[173]***Preliminary Findings from the Haynie Site (5MT1905) Fauna*

The Haynie Site (5MT1905) is a multicomponent Ancestral Pueblo community, located in southwestern Colorado, that includes two Chaco period Great Houses. This site is part of the larger Lakeview Community, which includes two other Great Houses located within 1 km. Material recovered from Haynie represents an unparalleled way to examine how Chacoan outlier communities formed, were sustained, and integrated within the larger region. Faunal remains are particularly relevant in understanding how human/environmental relationships played a part in each of these different topics. Here, I present preliminary findings from the ongoing Haynie Site faunal analysis. I focus on how animal resource diversity relates to the establishment of the site, how it shifted during the creation of the Lakeview Community, and whether there was animal resource specialization within this cluster.

Domett, Kate [26] see Muir, Brianna

Dominguez, Ma. Rosario [11] see Folan, William J.

Domínguez-Rodrigo, Manuel [60] see Egeland, Charles

**Domnauer, Colin and Cathy Costin (California State University, Northridge)****[89]***Iconographic Evidence for the Use of Vilca (*Anadenanthera spp.*) during the Formative Period on the North Coast of Peru*

The central role of psychoactive plants in many major precolumbian Andean cultures is well documented, with an abundance of convincing evidence for their use in diverse geographical locations and time periods. However, significant spatio-temporal gaps remain in the archaeological record, where the current evidence of hallucinogen use in certain cultures is scarce or nonexistent. This paper sheds light on one such gap in our knowledge. Here we report our findings of the iconographic depiction of the hallucinogenic plant, vilca (*Anadenanthera spp.*), in Formative period ceramics on the north coast of Peru. Numerous artifacts are highlighted, which not only display morphological depictions of the plant form itself, but include symbolic imagery associated with shamanic themes. In some cases, we observe what appears to be a direct portrayal the subjective effects felt upon the ingestion of this powerful mind-altering plant. From this abundance of evidence, as well as considering the cultural context in which this iconography arises, we argue that vilca was both present in and utilized by Formative cultures on the north coast of Peru.

**Donaruma, William (University of Notre Dame) and Ian Kuijt (University of Notre Dame)****[179]***Archaeology and the Public: YouTube, Subscribers, and Popularizing the Past*

As temporary custodians and interpreters of the past, archaeologists create narratives of local historical moments and evolutionary trajectories that help the general public understand worlds that have now disappeared. We struggle to find engaging and effective means of sharing our knowledge and understandings with the general public. Traditionally we rely on the written word, photographs, blogs, and web pages to create our narratives. We are only partially effective in communicating with the general public and our voice and authority has been diminished through peoples increased reliance on social media for information. In this presentation we discuss the development and goal of the new YouTube channel called Coastal Ireland. This channel provides high-quality visual films that are rooted in archaeological data, oral history, and personal stories, to a general educated audience. This channel is focused on presenting (1) visually rich three-minute films centered on post-medieval and medieval cultural heritage, and (2) thematically driven treatments of Irish heritage, culture, and music. We have developed 16 films at this point. We discuss the rationale and goal of this project and consider how the use of social media such as YouTube provide new opportunities to increase awareness of, and interest in, archaeology.

Donayre Pachas, Sol [190] see Dalton, Jordan

Dong, Yu [193] see Miller, Melanie

Dong, Yu [32] see Wang, Yifan

Dongoske, Kurt [152] see Spears, Michael

**Donner, Natalia (Leiden University), Andy Ciofalo (Leiden University) and Lucy Gill (University of California, Berkeley)**  
**[125]**

*A Deep History of Indigenous Landscape Stewardship and Cuisine in Darién Province, Panama (1300 BCE–present)*

Despite its unique location at the intersection between the North and South American continents, an important locale for biotic and cultural exchange, the Darién Province of Panama has received no regional systematic archaeological investigation until 2019, with the establishment of Darién Profundo. Focused around the Gulf of San Miguel watershed, on the Pacific coast of eastern Panama, this project has partnered with Indigenous and other local communities to create the first chronology of human-environment relationships in this region. We present the integrated results of preliminary starch, ceramic, and faunal analyses, contextualized within regional paleoenvironmental and ethnohistoric data, which suggest consumption of both wild and domesticated taxa and the employment of particular fired-clay kitchenware and cooking techniques that show both continuity and shifting tendencies through time. Faunal analysis to date has focused on shellfishing, suggesting temporal shifts in target species despite continuity in harvesting techniques and disposal practices. We discuss the importance of involving community members in the research process and historical insights that have emerged related to shifting ecological baselines. We address the longevity of Indigenous landscape stewardship and foodways in Darién Province, which continue to influence the contemporary ecology and cuisine of Panama.

**Donta, Christopher (SWCA)**

**[28]**

*The Troublesome Distribution of Ulu in Time and Space*

The distribution of the ulu across North America has defied explanation for many decades, particularly as excavations in the Northeast have pushed its origins further back in time. This artifact, one of the hallmark material items traditionally associated with “Eskimo” populations, was originally assumed to have been brought in an easterly direction across the Arctic with the migration of people from the Bering Straits, expanding in use to Algonquian ancestors of the Northeast. After decades of research, however, the earliest dates for ulu appear to be in the Northeast and not in the Arctic. What can account for this? Did the ulu actually move west across the Arctic, implying that it was originally associated with peoples of the Archaic Northeast? Or was the ulu independently invented in two different regions? This paper looks at previous publications on the ulu, and data from the Arctic and Northeast to clarify the current distribution of dates and locations for use of the ulu. Hypotheses are presented to explain the distribution, and implications for concepts of migration and diffusion are discussed.

**Donta, Jaime (POWER Engineers)**

**[77]**

*They Toil on Foreign Soil: Farmers of the Irish Diaspora in Massachusetts*

The Anthony Farmstead site (SOM.HA.4) in Somerset, Bristol County, Massachusetts, was excavated as part of a mitigation project for a proposed electrical substation. Documentary research suggests that the farmstead was established in 1757 and passed father-to-son through multiple generations of a prosperous New England Yankee family until the mid-nineteenth century, when the property was rented out to tenants. Census records indicate that the longest tenant occupation of the property was by a young family of Irish immigrants. Data recovered during the excavation will be used to shed light on the lives of the Irish tenant farmers, who are not as well represented in the documentary record as are the Yankee inhabitants who preceded them. Archaeological materials will also be used to articulate the immigrant family with the larger Irish nineteenth-century diaspora culture and to consider how the family engaged in identity formation simultaneously as Irish and as new Americans. Nineteenth-century Somerset was a supporting peripheral area to the neighboring industrial hub of Fall River, Massachusetts, and the farmstead data will also be used to examine the influence of and participation in an industrialized and capitalist market framework.

Dorshow, Wetherbee [221] see Meacham, Samuel

**Dossett, Emily**

**[137]**

*Discussant*

**Doubles, Catherine (University of Illinois, Urbana Champaign)**

**[119]**

*Habitation and Interaction in the Lower Illinois River Valley: A Case Study on Household Structure and Ceramics at the German Site (11C377)*

In this paper, I explore cultural interactions that took place in the Lower Illinois River Valley (LIRV) German site (11C377) during the Late Woodland (AD 800–1200) period when novel Mississippian lifeways were being initially developed and adopted in the American Bottom. During the 2019 field season, a house basin was excavated to improve understandings of the nature of social interactions taking place at the German site between local residents and Mississippian peoples. Several sites were additionally used to situate the German site within its currently understood archaeological context. I discuss the results of the excavation and regional comparisons in terms of hybridity, ceramic theory, and household theory to address the ceramic tradition and construction techniques used to build the house basin. Based on this analysis, I argue that German appears to be a typical terminal Late Woodland community, but one with connections to Mississippian ceramic traditions, either in the form of trade or transmission of ceramic production techniques. Expanded interpretations will require more extensive excavations and ceramic analysis; however, the initial examinations demonstrate that the German site will be an important site for the continued study of Late Woodland/Mississippian cultural interaction during this time of transition in the valley.

**Dougherty, Haley (University of Nevada–Las Vegas) and Karen Harry (University, of Nevada Las Vegas)****[144]***Investigating the Source of Sand-Tempered Pottery at Pete's Pocket, a Virgin Branch Puebloan Site on the Shivwits Plateau, Northwestern Arizona*

Three kinds of ceramics were produced in the Virgin Branch Puebloan heartland; one of which—Tusayan Gray Ware, Virgin series—is the focus of this paper. Virgin series ceramics are typically described as having light to medium gray pastes and quartz, or sometimes multilithic, sand tempers. Although sourcing studies have yet to be conducted for these ceramics, they are generally thought to have been produced west of Kanab Creek in areas where white-firing clays and river sands could be found. Where no such materials are present—such as on the Shivwits Plateau—the presence of this pottery has been thought to reflect trade. Recent excavations on the far southern end of the plateau there, however, have yielded a highly variable collection of sand-tempered wares exhibiting tan and brown pastes not typical of Virgin series ceramics. These ceramics also exhibit a high degree of variation in the angularity and mineralogical composition of their sand tempers. To evaluate where these ceramics might have been produced, refiring experiments and mineralogical studies were conducted. This paper reports on the results of those studies and discusses the implications of our findings.

**Douglass, John (Statistical Research Inc.) and Susan Chandler (Alpine Archaeological Consultants)****[219]***The Founding of Modern CRM Archaeology*

Cultural resource management (CRM) is a field that, while begun principally as university-based programs in the 1970s, has its modern foundation in the 1970s and 1980s among founders of privately held firms. Through time, the number of private CRM firms has grown immensely, whereas the number of university-based CRM programs has declined. Early on, CRM firms focused almost strictly on archaeology, but today's CRM encompasses a much wider range of opportunities for clients. This introductory paper offers a background to this session on the founding of CRM firms in North America and a context for the papers to come.

**Douglass, John (Statistical Research Inc.)****[219]***Chair*

Douglass, Kristina [122] see Davis, Dylan

Douglass, Kristina [120] see Hixon, Sean

Douglass, Matthew [204] see Davies, Benjamin

Douglass, Matthew [90] see Tizazu, Michaela Zewdu

Doyon, Luc [139] see Yin, Ruixue

**Dozier, Crystal (Wichita State University)****[136]***Qualitative Study of SAA Members Involved in Higher Education: Preliminary Results*

Higher education, college and graduate study, is the mechanism for preparing archaeologists both in applied and academic careers. The Committee on Curriculum for the Society for American Archaeology published a set of principles for higher education archaeological pedagogy as *Teaching Archaeology in the Twenty-First Century* (2000). The landscape of higher education has evolved in the past 20 years, especially in the roles, obligations, and demography of faculty, students, and archaeology practitioners. To understand the changing needs of the discipline, a discrete but diverse sample of SAA members were interviewed in their roles as faculty members, students, and archaeology professionals. Analysis of the interviews reveals systematic disconnects between the qualifications that archaeology employers are looking for in new graduates, the resources available to faculty members, and the expectations of students within archaeology. This presentation highlights those areas of disconnect, with suggestions for next steps both in recognizing these gaps as well as how professional societies, such as the SAA, can help bridge the divide.

**Dozier, Crystal (Wichita State University)****[136]***Chair*

Dozier, Crystal [39] see Banks, Jennifer

Dozier, Crystal [39] see Gann, Savannah

Dozier, Crystal [69] see Blair, Zoe

**Drew, Brooke (Indiana State University / Cardno)****[178]***The Medallion: An Exploration of Religious Items Recovered from the Milwaukee County Poor Farm Cemetery, 1882–1925*

Contemporary accounts of funerals at the Milwaukee County Poor Farm Cemetery (MCPFC) detail sparse and impersonal burials conducted by institutional workers. Familial involvement was rare, and this is reflected in the low frequency of intentionally placed

grave goods or personal items. Most uncommon among these artifacts are items of ritual or religious significance like rosaries, crucifixes, or prayer medallions. Of the more than 2,000 interments excavated during the multi-phase MCPFC Project, only 29 contained such objects. The unusual presence of these small but important tokens paints a fuller picture of agency in the mortuary process within an institutional context. This paper will explore the significance of these “small things” in understanding the lives, deaths, and burials of these once forgotten individuals.

Drexler, Carl [136] see Colaninno, Carol  
Drexler, Carl [159] see Rayburn, Kathryn

Dubos, Christian [74] see Vidal-Elgueta, Alejandra

Dubreuil, Laure [191] see Kollaard, Jelissa  
Dubreuil, Laure [191] see Paixao, Eduardo

**Duff, Andrew (Washington State University), Judith Habicht-Mauche (University of California, Santa Cruz) and Rob Franks (University of California, Santa Cruz)**

[41]

*Glaze-Paint Composition in the Upper Little Colorado and Western Zuni Regions*

We used LA-ICP-MS to examine glaze-paint pigmentation recipes and lead isotope analysis to investigate lead sources used during the Pueblo IV period in the Upper Little Colorado and Western Zuni regions of the US Southwest. Pigment data suggest common glaze-paint recipes across adjacent regions, suggesting the presence of cross-cutting technological communities of practice and the circulation of ideas, production techniques, and (probably) potters. Additionally, potters in these regions used raw materials that derive from two main sources, Cerrillos and Hansonburg. Potters in the western Pueblo regions seem to have regularly mixed materials from both sources in their glaze paints, a stark contrast to Rio Grande potters who typically utilize a single source. Similarity in glaze recipes applied to both Zuni Glaze Ware and White Mountain Red Ware suggest shared practices at the village, intraregional, and interregional scales. These findings contribute to the increasingly macroregional exploration of glaze-paint technology and we conclude by situating these data in this larger analytical frame.

**Duggins, Ryan (Bureau of Archaeological Research) and Heather Walsh-Haney (Florida Gulf Coast University)**

[46]

*Inundated Wet-Site Archaeology: Manasota Key Offshore and the Future of Submerged Precontact Archaeology on the Continental Shelf*

Delicate precontact archaeological materials located within stratified sediments withstood Holocene sea-level rise and survived thousands of years in the Gulf of Mexico. Manasota Key Offshore (8SO7030) is a Middle Archaic mortuary pond that rests in the nearshore waters of Sarasota County, Florida. Archaeological investigations documented the preservation of prehistoric organic materials including worked wood, cordage, and the remains of at least 11 individuals (including prenatal, juvenile, adult, and geriatric adults). Research at Manasota Key Offshore focused on identifying the boundaries of the inundated paleopond and determining the extent and preservation of archaeological material. This unique site provides a window into Florida's changing landscapes, particularly in relation to prehistoric and contemporary sea-level rise and subsequent human responses. The Manasota Key Offshore site contains an abundance of in situ archaeological material, challenging generations of archaeological attitudes that questioned the survival of submerged sites on the continental shelf and the benefit of their study. This research has the potential to guide state and federal cultural resource managers in the identification and protection of submerged cultural resources located across the country's continental shelves.

**Duggins, Ryan (Bureau of Archaeological Research)**

[46]

*Chair*

**Duke, C. Trevor (University of Florida) and Neill Wallis (University of Florida)**

[150]

*Secret Recipes: Potting Knowledge and Alterity in the Lower Southeastern United States*

Archaeologists involved in pottery provenance research often see petrographic analysis as a complement or supplement to more sophisticated sourcing techniques, such as neutron activation analysis (NAA) or laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS). However, provenance studies typically focus on vessel exchange, which constitutes only a subset of the social relationships implicated in pottery-making. Researchers have recently paid more attention to the extent to which temper “recipes” model social relations and identity. While pottery form and surface treatment can be easily mimicked, tempering practices are typically transmitted through close contact between experts and trainees. Further, social groups can establish alterity and prestige by maintaining control over tempering recipes through selective knowledge transmission and secrecy. Petrographic point-counting arguably provides the most precise means of quantifying and comparing paste recipes. Bearing these observations in mind, we combine point-count, NAA, and LA-ICP-MS data to provide a holistic view of the social relationships surrounding pottery production and exchange during the Late Woodland (ca. AD 650–1050) and Mississippian (ca. AD 1050–1550) periods in the Lower Gulf Coastal Plain. We mobilize these data to argue that some social groups in the Tampa Bay region gained prestige by controlling the recipes and manufacturing techniques of mortuary potting.

Duke, C. Trevor [67] see Wallis, Neill

**Duke, Daron (Far Western Anthropological Research Group), D. Craig Young (Far Western Anthropological Research Group), Anya Kitterman (Hill Air Force Base), Jaynie Hirschi (Air Force Civil Engineer Center) and Konnie Wescott (Argonne National Laboratory)**  
[24]

*An Introduction to the Hello Site: A 12,200-Year-Old Open-Air Haskett Camp in the Eastern Great Basin*

In 2012, a lithic scatter with a Haskett point was found eroding out of the Great Salt Lake Desert playa. Dubbed the Hello site (42TO5136), it was the first indication of intact context found among the hundreds of surficial lithic scatters dating to the terminal Pleistocene–Early Holocene and associated with the Old River Bed delta, a once-vast wetland distributary complex. The Hello site prompted further archaeological survey that resulted in the now well-known Wishbone site, a similarly dated Haskett hearth site located only 200 m away, which was fully excavated in 2016 to mitigate rapid erosion. The Hello site was revisited in 2017 for testing, and a buried hearth was clipped by excavations and sampled for radiocarbon dating but otherwise left in place for future work. Here we present the Hello site data with preliminary results from new excavations to put the assemblage in context with broader patterns in Haskett lifeways during the Younger Dryas.

Duke, Daron [206] see Davis, M. Kathleen

Duke, Daron [187] see Freund, Kyle

Dumouchel, Laurence [20] see Hill, Cameron

**Duncan, Neil (University of Central Florida), Sarah Barber (University of Central Florida), Thomas Penders (Cape Canaveral Space Force Station) and Sandra Wheeler (University of Central Florida)**  
[24]

*The Cape Canaveral Archaeological Mitigation Project: Six Years of Collaborative Research on Cape Canaveral Space Force Station*

The Cape Canaveral Archaeological Mitigation Project (CCAMP) is a collaborative research program between the University of Central Florida archaeology faculty, graduate, and undergraduate students, and personnel from Space Launch Delta 45 of the US Space Force at Canaveral Space Force Station. The project, now in its sixth year, has trained 51 undergraduate and three graduate students in archaeological survey, excavation, site mapping, paleoethnobotany, ceramic and lithic analyses, faunal analysis, and archival records searches. The research team has worked at four historic and prehispanic sites on the station, with particular emphasis on Phase I and II fieldwork and extensive laboratory analysis of materials from the Burns Mound Site (8BR85). Once a large village with an associated burial mound, the site lies on the east bank of Brevard County's Banana River, part of the Indian River Lagoon system. This poster presents a brief history of CCAMP and an outline of some of the findings from the Burns Mound Site. Ceramic analysis and microremains of ceramics residues, together with faunal data suggest that ceremonial and quotidian activities took place at the site between approximately 900 and 1600 CE that attracted participants from beyond the immediate area.

**Dungan, Katherine (Arizona State Museum)**  
[215]

*Local Flavor: Regional and Superregional Patterns in Roosevelt Red Ware in Central Arizona's Tonto Basin*

Roosevelt Red Ware, which is present over a large portion of the late fourteenth to early fifteenth-century southern and central US Southwest, is known both to have been produced locally in many or most of the areas where it was used and to adhere to a set of general design principles across this immense area. The spread of the ware, its consistency across space, and its relationship to the movement of people and ideas, have long fascinated archaeologists. However, at least some regional differences are known to be present in Roosevelt Red Ware, and understanding the place of this pottery in society requires understanding its local as well as superregional context. This study examines "localness" in Roosevelt Red Ware from the Arizona Transition Zone, and particularly the Tonto Basin. Past work demonstrates that Roosevelt Red Ware was produced in the Basin, potentially by a limited group of potters. The work described here uses vessel form and design elements to explore the relationship of Tonto Basin Roosevelt Red Ware to other local pottery traditions and to illuminate larger patterns in variation in Roosevelt Red Ware among regions.

Dunning, Nicholas [11] see Kupprat, Felix

Dunning, Nicholas [48] see Lentz, David

Dunning, Nicholas [48] see Reese-Taylor, Kathryn

**Duru, Gunes (Mimar Sinan Fine Arts University) and Mihriban Özbasaran (Istanbul University)**  
[16]

*How Sheep Shaped an Early Neolithic Community in Central Anatolia*

Aşıklı is one of the earliest Neolithic sites in Turkey. The excavation of the site began as a rescue effort in 1989, but shifted to a formal excavation in the early 2000s. This new phase of excavation enabled us to ask new research questions and form new collaborations. Our primary questions explored the transition from a hunter-gatherer way of living to a settled life, including the emergence of domestication. Mary Stiner, one of our primary new collaborators, made leading contributions to the project not only in her field of archaeozoology, but in other fields of archaeological science as well. By asking detailed questions using in depth methods, Mary and the archaeozoology team produced groundbreaking research that described the emergence of sheep and goat management in detail in central Anatolia for the first time. In our presentation, we draw on this context to discuss the mutual impacts

of “animal management” and material culture. We discuss how changes in subsistence and economy mutually impacted settlement layout, the use of space and potentially building form. Through this presentation, we and the other members of the Aşıklı research team, express our gratitude to Mary Stiner for kindly supporting and invigorating the Aşıklı Research Project.

**Dusseldorp, Gerrit (Leiden University; University of Johannesburg), Luc Amkreutz (National Museum of Antiquities, Leiden) and Welmoed Out (Moesgaard Museum)**

[149]

*Move Along, Move Along: Neolithic Foragers, Mobility, and Settlement Systems ~4000 BCE in the Dutch Wetlands*

Early Neolithic societies in the western parts of the Low Countries were essentially foragers who adopted small quantities of domestic resources into an otherwise fishing-gathering-hunting economy. The appearance of the first sedentary settlements postdates the appearance of domestic resources by around a millennium. The settlement system and mobility strategies of societies practicing small-scale horticulture as well as stock keeping are debated. Small-scale crop growing in the wetlands is only attested at a few locations, at others, cereal remains probably represent imported resources cultivated elsewhere. Livestock soon includes all four classic domestic species, but at many places seems subordinate in relation to hunting, fishing, and foraging. We review evidence from material culture and subsistants to determine characteristics of the settlement system. We focus specifically on different and sometimes contradictory indications for subsistence and seasonality. We highlight some of the limitations of the datasets for the reconstruction of prehistoric mobility strategies and attempt to arrive at a best-fit interpretation of the mobility strategies practiced by Dutch wetland societies around 4000 BCE. Instead of looking at foraging societies with some domesticates as transitional, analyzing their economies and settlement system as an end in itself leads to a better understanding of these societies.

**Dussol, Lydie (Université Côte d'Azur), Kenneth Hirth (Penn State University) and Timothy Scheffler (University of Hawai'i)**

[76]

*Holocene Vegetation Changes and Fuel Use in the Honduran Highlands: The Anthracological Sequence of El Gigante Rockshelter (11,000–1000 BP)*

Holocene pollen sequences have highlighted several episodes of vegetation opening in Central America since the Archaic period, which have often been related to the dispersal of nomadic slash-and-burn agriculturalists from the Central Mexican Highlands. However, few archaeobotanical data from archaeological sites have been available to date to examine woodland changes in relation to prehistoric occupations in the Highlands. El Gigante Rockshelter, Honduras, was occupied in intermittent phases over the last 11 millennia according to excavations conducted in 2001–2002 by the Pennsylvania State University. The anthracological (charcoal) analysis of this long and well-dated sequence allows us to explore changes in the fuel economy of these populations as a result of successive climatic, ecological, economic, and cultural changes from the Paleoindian to the Classic period. This unique case study helps us understand the processes of anthropogenic landscapes construction in prehistoric Mesoamerica.

**Dussubieux, Laure (Field Museum of Natural History)**

[132]

*Production and Circulation of the Glass Beads from Kish, Iraq*

The study of glass in the Middle-East is essentially focused on vessels. Ornaments and more especially beads have been largely neglected and very little is known about their production and trade. Beads in general and glass beads in particular are durable artifacts traded over long distances that can contribute to the reconstruction of interregional exchange networks. From 1923 to 1933 the Field Museum and Oxford University excavated the site of Kish, located in modern Iraq, 80 km south of Bagdad. Kish is an ancient city occupied as early as 3200 BC through the seventh century AD. A little more than 400 glass beads were identified in the anthropology collections at the Field Museum. The scarcity of the contextual information for most of the beads as well as an often-poor preservation state created challenges for their study. This research is based on the typological observation of the beads as well as the elemental analysis of the glass using laser ablation–inductively coupled plasma–mass spectrometry. The results show a complex glass bead procurement pattern involving local production centers as well as production centers located in South Asia.

**Dussubieux, Laure (Field Museum of Natural History)**

[132]

*Chair*

Dussubieux, Laure [132] see Shugar, Aaron

Dussubieux, Laure [132] see Wade, Mariah

**Duwe, Samuel (University of Oklahoma), Chris Garcia (Pueblo of Acoma), Everett Garcia (Pueblo of Acoma), Kurt Riley (Pueblo of Acoma) and Kurt Anschuetz (Pueblo of Acoma)**

[66]

*Protecting and Learning from the Pueblo of Acoma's Heritage in the “Lands Between” of Southeastern Utah*

This project focuses on endangered archaeological sites in southeastern Utah that date to the Early Pueblo period (AD 650–950). This time and place, dubbed the “crucible of Pueblos” by archaeologists, was where the first Pueblo Indian villages emerged some 1,300 years ago as people began to settle into centralized places and increasingly rely on agriculture. Besides the region's value in addressing anthropological questions such as humanity's transition to agriculture, descendant Pueblo tribes, including Acoma, consider southeastern Utah to be an important part of their ancestral homelands; where their respective First Ancestors emerged into the natural world and constituted the original Pueblo people before embarking on migrations to reach their current homes. We emphasize building a co-equal partnership between archaeologists and Pueblo people through community-engaged preservation archaeology to (1) pursue big-picture scientific research questions using low-impact archaeological methods, (2) protect

archaeological sites through raising awareness of the importance of these places and to advocate for federal protection, and (3) facilitate opportunities by members of descendant communities to participate in the stewardship of cultural resources. The latter is vital to Acoma's goals of building a healthy and sustainable future through the protection of the Pueblo's cultural inheritance established by the First Ancestors.

**Dyer, Jennifer (Six Rivers National Forest)**

[207]

*TEK-based Management and Shared Stewardship of a Cultural Landscape in Northern California*

Shared stewardship, collaboration, and cultural revitalization are central tenets of the Western Klamath Restoration Partnership (WKRP). Coming from an adversarial past, WKRP shared values are uniting groups in Northern California with the goal of restoring fire to benefit cultural and natural resources for the community and the health of a landscape. Six Rivers National Forest and the Karuk Tribe have embraced traditional ecological knowledge (TEK), Indigenous science, and tribal values, while also embracing cross-training opportunities, information-sharing, relationship-building, and trust. TEK is informing our approach to forest management that uses fire to reduce fuel loads, improve watershed health, and reduce the risk of catastrophic fires. TEK has led to the formulation of targeted fuel treatments for cultural and ecological resource benefits to protect tribal practices dependent on the use of fire as a land management tool, and to preserve plant and animal species that depend on habitats maintained by frequent fires. TEK connects us to why places are significant, the cultural and natural values at risk, and how we can restore these places through TEK-inspired principles. WKRP is a model for how the Forest Service can work collaboratively with Tribes and be better stewards of cultural landscapes.

**Dyrdahl, Eric (Pontificia Universidad Católica del Ecuador) and Carlos Montalvo (Museo de Arte Precolombino Casa del Alabado)**

[124]

*Late Formative (800–400 cal BC) Social Networks in Northern Ecuador: The Evidence from Las Orquídeas, Imbabura*

The archaeological record in Ecuador is well-known for its abundant evidence of interregional interaction. However, most research to date has focused on contacts between the Ecuadorian coast and adjacent regions of the Andes, leaving out possible connections with the upper Amazon for various reasons. Recently, at the site of Las Orquídeas, located in the outskirts of the modern city of Ibarra, excavations uncovered an intact stratigraphic sequence dating to 800–400 cal BC with abundant evidence of nonlocal raw materials and artifacts. In this paper, we analyze the evidence from Las Orquídeas that indicates that a far-reaching interaction network connected many regions of prehispanic Ecuador. After presenting the general characteristics of this network based on the recovered evidence, special emphasis is placed on possible contacts between the northern Ecuadorian highlands and adjacent regions of the upper Amazon. Ultimately, we argue that various lines of evidence indicate that populations living in the upper Amazon also participated in this network.

**Earl, Dale (US Air Force), Rebecca Baisden (US Forest Service) and Nicholas Poister (US Park Service)**

[207]

*Historical Ecology and Archaeology: Looking to the Past for Future Land Management*

The land managing agencies of the US federal government have long been tasked with the responsibility of balancing the preservation of the natural environment with projects that allow for the use of natural resources. While the protection of historic properties has been a responsibility of the federal government for decades, federal archaeologists' potential contributions to land management decision-making have been largely overlooked. This is despite the fact that archaeologists have developed deep time narratives of human interaction with local environments that span millennia. Historical ecology is a research program for studying the dynamic relationship between humans and their environments in the past, present, and future. The strength of this framework is the way in which it employs a multidisciplinary approach to understand human/environment relationships. This session explores the ways in which the adoption of historical ecological frameworks can facilitate federal archaeologists playing a more significant role in land management programs. We argue that by adopting a historical ecological approach, federal archaeologists will be better able to integrate their work with that of other disciplines, as well as collaborate with Indigenous communities, leading to more holistic strategies in federal land management.

**Earl, Dale (US Air Force)**

[207]

*Chair*

Earl, Dale [207] see Baisden, Rebecca

**Earley, Caitlin (University of Nevada, Reno)**

[55]

*The Good Captive: Portraits and Power in Classic Maya Sculpture*

Existing studies of portraiture in a variety of art historical traditions focus on the elite. In this study, I consider a different type of portrait: the depiction of Classic Maya (ca. 300–900 CE) war prisoners. Often appearing in tandem with their captors—usually kings—captives on carved stone monuments challenge traditional conventions of portraiture in Maya art. I argue that depictions of war captives communicated ideal cultural values through an iconographic interplay between the general and the specific. Beginning with a case study of Piedras Negras Panel 12, I examine conventions for the representation of captives, including “types” of captive bodies and their ability to communicate political and cosmological information. In additional case studies, I consider how shifts in power are expressed in captive portraiture through sequential portrayals and the manipulation of stone sculpture. Depictions of

captives problematize and expand the study of Indigenous American portraiture and demonstrate that disempowered actors played key roles in ritual and political practice in the ancient Maya world.

**Eberl, Markus (Vanderbilt University), Michael McBride (Independent Scholar) and Jesse Spencer-Smith (Vanderbilt University)**

[206]

*Identifying Lithic Microdebitage with Experimental Archaeology, Dynamic Image Analysis, and Machine Learning*

The identification of lithic microdebitage has been an archaeological challenge. So far, scholars have identified lithic microdebitage manually. Sifting through millions of particles under a microscope not only required time (which limited the number of samples) but also increased observer errors. In the following, we discuss novel approaches based on experimental archaeology, dynamic image analysis, and machine learning. We collect microdebitage from the experimental knapping of chert and obsidian; commercially mined sand and gravel serves as comparison. Archaeological test data comes from various sites in the Classic Maya lowlands. Samples contain several hundred thousand particles on average. We analyze experimental as well as archaeological samples with a dynamic image particle analyzer. The latter's output consists of grayscale photos and measurements of ~40 variables for each particle. We use various machine learning models as well as deep convolutional neural network to classify particles. Dynamic image analysis and machine learning allows us to process large microdebitage samples in standardized ways. Combined with experimental data, we can tackle issues that have hampered microdebitage analysis so far.

**Eberl, Markus (Vanderbilt University)**

[206]

*Chair*

Eberl, Markus [206] see Estrada Aguila, Rebecca

Eberl, Markus [206] see Johnson, Phyllis

Eberl, Markus [206] see Rieth, Amy

**Ebert, Claire (University of Pittsburgh), John Walden (Max Planck Institute for Evolutionary Anthropology), Julie Hoggarth (Baylor University) and Jaime Awe (Northern Arizona University)**

[218]

*Low-Density Urbanism, Sustainability, and Resilience in the Eastern Maya Lowlands*

Recent research into urbanism in the southern Maya lowlands has found that cities are characterized by a distinctive type of low-density settlement. Not only did larger cities typically have lower densities than smaller ones, but they also possessed economic systems based at the local level, which likely played key roles in their sustainability and resilience. Here we compare the low-density urban structure of four major Classic Maya polities in the upper Belize River Valley of west-central Belize: Baking Pot, Cahal Pech, Lower Dover, and Xunantunich. Over 75 years of research in this region indicates that these centers never developed the types of nucleated settlement typically associated with western "urbanism." Instead, the longevity of Belize Valley centers was fostered at each site by unique agricultural infrastructure—including in-field farming systems, ditched fields, and water storage facilities—that allowed for intensive food production in addition to access to wild resources. We also argue that the success of low-density cities in the Belize Valley was related to political organization by intermediate elite families who served as district-level administrators. These features provided economic and social foundations for the sustainability and resilience of Belize Valley centers over two millennia of continuous habitation.

Ebert, Claire [157] see Freiwald, Carolyn

Ebert, Claire [96] see Roa, Ian

Ebert, Claire [54] see Walden, John

**Eberwein, Ann (University of Wisconsin–Milwaukee)**

[61]

*Museums and Paleoethnobotanical Methods: A Case Study from Neolithic and Bronze Age Alpine Europe*

Wetzikon-Robenhausen, Switzerland, was the site of numerous occupations by circum-Alpine pile dwelling peoples during the Late Neolithic and Early Bronze Age, between 4000 and 1500 BC. This site was excavated during the second half of the nineteenth century and because of the nature of early archaeological methods, the material culture was dispersed to museums in the United States and Europe as part of an artifact diaspora. Two Robenhausen archaeobotanical collections housed at the University of Pennsylvania Museum of Archaeology and the Milwaukee Public Museum have been analyzed with a focus on food-related plant remains. This paper presents the results of this research. These assemblages are dominated by cereal grains, crab apples, and amorphous charred objects previously identified as bread. This research focuses on the identification of species and food processing methods, and assesses nineteenth-century taxonomic assignments. In addition, the comparison of two museum collections demonstrates the importance of the digital reunification of this material. This analysis shows the utility of "orphaned" museum collections because these findings, combined with data from modern excavations, facilitate an understanding of the circum-Alpine sites and, more broadly, to an understanding of foodways, cuisine, food processing, and agriculture in Neolithic and Bronze Age Europe.

Eccles, Laurie [120] see Hixon, Sean

Echeverría Castillo, Susana [34] see Peniche May, Nancy

Eck, David [66] see Tsesmeli, Evangelia

**Eckert, Suzanne (Arizona State Museum, RPA) and Deborah Huntley (Tetra Tech)**

[150]

*Identity as Expressed through Utility Wares at Goat Spring Pueblo in South-Central New Mexico*

Our research at Goat Spring Pueblo, a late Ancestral Pueblo period (AD 1300–1680) village located in the Rio Abajo region of south-central New Mexico, examines four realms of social dynamics that can be traced in the archaeological record: identity, ritual, economy, and resistance. One goal of our research is to explore the nature of identity through examination of technological style. Specifically, we are interested in how group identity continued or transformed over time. Due to its geographic location and its multiple occupations, Goat Spring Pueblo is ideal for addressing this issue. Not only was this village located at the border between Zuni and Piro lands, but it also was situated along the trail that connected Western Pueblo and Rio Abajo villages. As such, the Goat Spring Pueblo may have been a gateway for the movement of immigrants, religious ideas, and goods between the Rio Grande and Western Pueblo regions. We present the results of our petrographic analysis of utility ware from Goat Spring Pueblo, which indicate shared attributes with multiple cultural regions. This has social and cultural implications for interpreting group identity among residents of this late Ancestral Pueblo village.

**Eckert, Suzanne (Arizona State Museum, RPA)**

[41]

*Chair*

Eckert, Suzanne [41] see Ferguson, Jeffrey

Eckert, Suzanne [41] see Habicht-Mauché, Judith

Eckert, Suzanne [41] see Phillips, David

**Edgeworth, Matthew (University of Leicester)**

[50]

*Up-scaling Archaeological Methods to Deal with Waste Landscapes*

Envisage a section through anthropogenic ground about 16 km in length. Starting in a provincial English town, where the archaeological ground is no more than 2 m deep, it extends into the rural countryside, through a series of giant clay extraction pits associated with a now defunct brick industry. Some are over a kilometer wide. Between the 1970s and the 1990s the massive voids of the pits were filled with compacted landfill waste from the nearby city of London to a depth of up to 65 m, in some cases being overfilled to form low-lying hills. Although on a different order of scale to what most archaeologists are familiar with, this is in every respect an archaeological landscape. The features sectioned have cuts, re-cuts, and fills just like smaller rubbish pits typically encountered on normal-sized archaeological sites. Principles of archaeological stratigraphy still apply—whatever the scale. The features are so large it would be impossible to cut such a section. But it can be drawn from available data. This is a useful exercise in several respects. The question arises—to what extent can traditional archaeological methods be up-scaled to deal with the mega-features of recently formed waste landscapes?

**Edgeworth, Matthew (University of Leicester)**

[50]

*Chair*

**Edmonds, Mackenzie (Indiana University South Bend), Joshua Wells (Indiana University South Bend), Eric Kansa (Open Context), Sarah Kansa (Alexandria Archive Institute) and David Anderson (University of Tennessee, Knoxville)**

[72]

*Identifying Smithsonian Trinomial Site Numbers in JSTOR: The Potential for Open and Reproducible Text Mining of Primary Literature to Revolutionize Archaeological Information Management*

The new JSTOR Constellate portal provides resources to openly and reproducibly text mine the extensive holdings of primary literature in JSTOR, including all of their archaeological and anthropological materials. The Python computer programming language and Jupyter Notebook coding environments are the primary tools for investigators to work with JSTOR/Constellate. Using these tools, the authors were able to identify tens of thousands of Smithsonian Trinomial style archaeological site numbers from a wide range of archaeological and anthropological journals and export them for use with the Digital Index of North American Archaeology (DINAA) Linking Sites and Literature (LSL) project. The methods used to identify Smithsonian Trinomial style alphanumeric strings and to determine authentic site numbers using Python instructions and other digital tools will be discussed with reference to the JSTOR/Constellate “bag of words” approach for making full text data available. JSTOR/Constellate provide beginner and intermediate lessons and templates to guide new users and suggestions are made for the archaeological community to begin making greater professional and educational use of text mining to better grasp the immensity of the archaeological literature and connect it directly back to primary research, collections management, and various forms of computational modeling.

Edmonds, Mackenzie [72] see Wells, Joshua

Edwards, Alysha [83] see Prentiss, Anna

**Edwards, Briece (Confederated Tribes of Grand Ronde), Michael Lewis (Confederated Tribes of Grand Ronde), Chris Bailey (Confederated Tribes of Grand Ronde), Cheryl Pouley (Confederated Tribes of Grand Ronde) and Dustin Hawks (Confederated Tribes of Grand Ronde)**

[114]

*Conceptualizing Western Oregon Stone Bowls as Funerary Objects: A Pilot Study*

Stone bowls are common archaeological objects in western Oregon and are often displayed in museum contexts, yet research into the cultural practices associated with stone bowls has been minimal. Recent community discussions at the Confederated Tribes of Grand Ronde concerning the potential funerary context of a decorated stone bowl has prompted a reexamination of the definitions of and appropriate care for these objects. This paper presents results of a pilot study that statistically analyses physical attributes and recovery context from a sample of stone bowls in Oregon repositories. This analysis uses a practice-derived categorization of possessions as (1) non-funerary, (2) incidentally interred, (3) used in life and interred as funerary objects, and (4) funerary objects created exclusively for funerary activities. The implications for community members, archaeologists, and collections managers are discussed.

Edwards, Briece [223] see Kretzler, Ian

**Edwards, Richard (UW-Milwaukee)**

[227]

*Settlement, Subsistence, and Ridged Fields: Exploring the Impacts and Variation of Agricultural Production in the Middle Fox Locality*

Agriculture has long been associated with the Middle Fox Locality. However, despite the strong indications about the importance of agriculture, interpretations have often been limited by the small number of well-excavated sites and inadequate environmental data to adequately contextualize these finds. However, excavations in the region over the last 20 years, coupled with the publicly available GIS datasets, have opened new avenues of analysis. This paper integrates subsistence data from recent excavations with new and updated spatial data to recontextualize the role of agriculture and its role within the larger settlement system.

**Edwards, Richard (UW-Milwaukee)**

[227]

*Chair*

**Eerkens, Jelmer (University of California, Davis), Kevin Vaughn (University of California, Riverside), Moises Linares-Grados and Christopher Beckham (University of California, Davis)**

[51]

*Stable Isotope Analysis of Faunal Remains and the Development of Pastoralism and Agriculture in the Nasca Region from Faunal Remains*

We report new carbon, nitrogen, and sulfur isotope data from camelid, cervid, and cavid remains from the site of Upanca in the Nasca region of Peru. Occupation at the site began in the Middle Archaic (ca. 3200–3000 BCE) and continued through the Nasca period (100–650 CE). While camelid remains predating 2500 BCE show low  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ , consistent with what is expected of wild animals, remains after this period show increasing, and especially more variable, isotopic values. We interpret this pattern as marking the introduction of camelid husbandry in the region, where some domesticated animals (llamas, alpacas) were foddered on maize, others were foddered on  $\text{C}_3$  plants grown in fertilized fields, and still others hunted from wild stocks (guanaco, vicuña). Data also suggest that cavid and at least some wild cervids were consuming maize or maize-derived products after 2000 BCE. Elevated  $\delta^{15}\text{N}$  values after 2000 BCE also suggest fields were regularly fertilized, while  $\delta^{34}\text{S}$  data are inconsistent with marine-derived products, such as bird guano, being used as fertilizer. Overall, our analysis provides new information on changing agricultural and animal husbandry practices in the region through time.

Eerkens, Jelmer [18] see Tushingham, Shannon

Efrain, Kaarina [90] see Leader, George

**Egan-Bruhy, Kathryn (Commonwealth Heritage Group)**

[171]

*Discussant*

**Egeland, Charles (UNC-Greensboro), Scott Richter (UNC-Greensboro), Ryan Byerly (Far Western Anthropological Research Group) and Manuel Domínguez-Rodrigo (Instituto de Evolución en África)**

[60]

*Harnessing Actualistic Data and Stratified Resampling to Model the Formation of Faunal Palimpsests*

Many archaeo-paleontological faunal assemblages are cumulative palimpsests, meaning that they represent the erasure, reworking, and/or overprinting of material from successive activities or processes. While potentially rich archives of past environmental dynamics, such assemblages pose significant interpretive challenges because of their often-complex formational histories. To unravel a cumulative palimpsest, some knowledge of its integrity (the homogeneity of the agents responsible for a deposit) and resolution (the homogeneity of the events responsible for a deposit) is necessary. We describe a methodology that simulates the formation of cumulative faunal palimpsests through stratified resampling of actualistic assemblages. The simulations produce expected ranges of variation for the frequency occurrence of various taphonomic characteristics (e.g., tooth-marked or cut-marked

bones) based on user-defined integrities and resolutions. We illustrate the technique by comparing simulated cumulative palimpsests to several early Pleistocene faunal assemblages from Olduvai Gorge, Tanzania. These comparisons highlight several issues that must be considered to ensure a valid application of the simulation approach. While the technique we outline here is constructed with and for assemblages of large mammal skeletal remains, it can be readily adapted for other types of faunal or even non-faunal data.

Einwoegerer, Thomas [149] see Brandl, Michael

Ejarque, Ana [89] see Robinson, David

**Ejarque Gallardo, Ángela (Universidad Nacional Autónoma de México), Nora Pérez Castellanos (Instituto de Investigaciones Estéticas), Martha Cuevas García (Coordinación Nacional de Conservación del Patrimonio Cultural) and José Luis Ruvalcaba Sii (Instituto de Física)**

[59]

*Artistic Implications of the Ceramic Technology and Pictorial Palette of Effigy Censers from Palenque, Chiapas, México: A Heritage Science Approach*

Palenque, a Mayan city built in the Classic period (AD 350–850) in Chiapas, Mexico, was characterized by the development of artistic expressions. Of note in this field is the collection of effigy censers, a set of ceramic objects used for ritual purposes. These censers represented the pantheon of Mayan deities worshipped at Palenque and have only been found in the temples of the ceremonial center. These objects were identified in all the temporal phases of the site, spanning a period of 500 years. Throughout their history, effigy censers underwent changes in manufacturing techniques and materials used, which may have been determined by technological, artistic, or cultural factors. This paper presents the first results obtained from the technological study of effigy censers using a set of noninvasive analytical techniques that allow us to resolve questions related to the artistic implications of the manufacturing and decorative techniques. Preliminary results allow us to observe temporal changes in the use of ceramic pastes that can be related to a change in manufacturing techniques. In the case of color, we also observed an increase in the pictorial palette and shades of certain colors over time.

**Ek, Jerald (Western Washington University)**

[110]

*On Classic Maya Imperialism*

Generations of archaeological research and the maturation of the decipherment of the Maya script have generated a wealth of new data on Classic Maya political dynamics. Extant data support two seemingly contradictory conclusions: the city-state as a durable political structure; and episodic development of expansionist polities. Unfortunately, empirical advancements have not yet instigated concomitant refinements in theory, due in part to a reluctance on the part of Mayanists to engage with relevant conceptual frameworks from outside our discipline. This paper contextualizes the growing body of evidence for asymmetrical inter-polity geopolitical networks derived largely from Indigenous textual evidence within comparative conceptual frameworks from anthropology and political science. This article addresses three interrelated questions: (1) Do Classic Maya political dynamics conform to definitions of imperialism? (2) How did the nature of the Maya city-state culture impact expansionist policies enacted by dominant kingdoms? (3) Can theories and conceptual frameworks from outside our field aid in the development of more robust models of Maya political organization? The central thesis of this paper is that political strategies implemented by Classic Maya kingdoms such as the Kaanul (Snake) dynasty of Calakmul have clear analogs in other cultural and historical contexts.

**Ei Hadjen, Mathilde (Université Libre de Bruxelles) and Estelle Praet (University of York)**

[138]

*Naked and Empowered: Nudity and Breast Representation in Aztec Codices*

Female nudity has been depicted through centuries and only recently has this been questioned by feminist activists. Nudity is often interpreted through a Western lens associating it with sexuality. Here we question the association between nudity, notably breast representation, and sexuality by analyzing the following codices: Borgia, Borbonicus, Azcatitlan, Aubin, Boturini, Magliabechiano, Mendoza, Telleriano-Remensis, Tudela, Vaticanus A, Laud, Florentine Codex, and the Tonalamatl Aubin. The vast majority of naked body illustrations can be found in prehispanic codices; in colonial manuscripts, they almost disappear. We can therefore question this disparity: is it due to clerical censorship in the postcolonial codices? Or was it a cultural issue of modesty? In order to be able to find any answer, one has to contextualize the rare images showing flesh as they appear in specific circumstances: captivity, punishment, but also sacrifice, unbridled sexuality, childbirth, transgression, shamelessness, and empowerment. Within this work we focus on breasts representations, among which breastfeeding scenes are common. Recently, archaeological studies have contributed to build a better understanding of weaning and breastfeeding practices through isotopic and trace analysis. This archaeological perspective will contribute to an understanding of the role, perception and breast representation of in prehispanic Mesoamerica.

**Eldredge, Kaitlyn (National Center for Preservation Technology and Training) and Jason Church (National Center for Preservation Technology and Training)**

[197]

*Cleaning Methods for the Removal of Wildland Fire Chemicals from Cultural Resources and Steps to Prepare for Future Fires*

In recent years millions of acres of land have burned in wildland fires across the United States. While wildfire poses a substantial threat to various cultural resources, fire suppression methods can also be detrimental. In addition to water, three classes of fire

chemicals are critical tools used to assist the suppression efforts of firefighting personnel. When cultural resources are accidentally or intentionally exposed to these chemicals, there can be significant consequences. As part of a two-year study by the National Park Service, an experiment was conducted to identify appropriate cleaning methods for precontact and historic building materials exposed to four wildland fire chemicals. A total of four cleaning solutions were compared for their success at removing fire chemicals from low-fired brick, calcareous sandstone, and Douglas fir. Working from the framework of disaster response and preparedness, the results of this experiment are discussed in terms of practical steps to conserve cultural resources impacted by fire chemicals. Additionally, guidance and resources are offered to prepare cultural resource managers for the upcoming fire season.

**Elezi, Gazmend (Postdoctoral Scholar)**

[147]

*Communities of Potters and the Regional Intra-actions in Late Neolithic Albania*

In the Balkans and Aegean, scholars have approached the distribution of Neolithic ceramic categories and circulation of vessels through cultural affiliation, reciprocity, and long-distance commodity exchange. However, the geographic spread of decorated Late Neolithic pottery in southern Albania does not overlap with the sociocultural landscape of interactions suggested by the above approaches. Recent research shows an irregular pattern of technological and decorative similarities of painted ceramic assemblages among settlements and areas. To understand the dynamics of relationships in shaping such a patchy geographical mosaic, I use the Communities of Practice framework. In this way, the main components of the ceramic landscape could be the communities of potters and their interactions, while the circulated technology, materials, and vessels boundary objects that connect individuals and groups from different sites and localities. The widespread stylistic and morphological features of the Late Neolithic pottery could indicate the essential role of the configuration and intra-actions of such communities in building and sustaining regional and interregional contacts. This approach offers a novel perspective to studying the Neolithic pottery alternative to culture-group and settlement-centric contexts that have dominated ceramic studies in the region for decades.

Elias, Albert [140] see Goodwin, Rebecca

Elias, Shirley [140] see Goodwin, Rebecca

**Ellis, Marina and Logan Kistler (National Museum of Natural History)**

[22]

*Archaeobotanical Impact of Precolonial Andean Mining: Investigating Crop Phytoaccumulation of Lead and Mercury*

Today, Andean regions like Potosi and Huancavelica are plagued by mining waste, contaminating air, water, and soil. Recent geoarchaeological research shows a surprisingly early record of ancient metallurgical pollution from the Andes' precolonial era of mining using environmental proxies like sediment and ice cores. This proves useful in confirming the phenomenon's existence but is insufficient in reconstructing a full ecological profile. This project aims to create a novel archaeobotanical method of heavy metal detection focused on four major ancient mining regions from central Peru and Bolivia, inspired by the nontraditional stable isotope analysis used in modern pollution studies. I hypothesize that at recorded lake sediment enrichment rates, archaeo-agricultural soils and plant macroremains will demonstrate a detectable quantity of heavy metals like lead and mercury. This would suggest a regional crop uptake of toxic metals by the decentralized polities period (~AD 1000–1400), damaging (but not completely exterminating) harvests and endangering surrounding communities.

**Ellis, Meredith (Florida Atlantic University)**

[17]

*Transitional Youths: Defining "Adolescence" in Nineteenth-Century New York City through Skeletal Remains*

In the early nineteenth century in New York City, there was no word for teenager. Today, teenagers are that transitional category between childhood and adulthood, but that label and category is a recent invention. And yet, the transitional period, even without a label, existed in the past as well. This paper will examine what I have called transitional youths, those between the ages of 10 and 15 (MNI = 7), in the skeletal remains unearthed from the burial vaults (1820–1850) of the Spring Street Presbyterian Church in lower Manhattan. I argue that these individuals do not represent a clear, unified group; rather, they illustrate the diversity of experiences that could occur as youths became adults in the urbanizing and industrializing space. Skeletal remains and historical records show some of the individuals living out childhood, while others were clearly occupying adult roles. Were these children to be protected, or were they adults, perhaps burying their own children in the vaults? Such questions highlight the complexities of identifying adolescence in the past.

Elvir, Wilmer [154] see Reeder-Myers, Leslie

Ely, Lisa [115] see Deans, Benjamin

Emanuela, Cristiani [61] see Gravel-Miguel, Claudine

**Emerson, Kjersti (ISAS, University of Illinois) and Thomas Emerson (University of Illinois)****[164]***Disentangling the 1924–1930 Rescue Excavations of George Langford Sr. at the Fisher Site, Will County, Illinois*

Between 1924 and 1930, George Langford, an engineer with the McKenna Process Company in Joliet, Illinois, and Albert Tennik, an immigrant factory worker, undertook to salvage what was one of the most impressive sites in northern Illinois. The Fisher Village and Mound site on the Des Plaines River contained about a dozen burial mounds and cemeteries as well as about 50 large house depressions. Langford was a reluctant excavator, first having approached numerous professional archaeologists to undertake the salvage efforts. Ultimately, he and Tennik excavated an amazingly complex set of houses, pits, and stratified occupations primarily dating to the Upper Mississippian era that has never been fully reported. About two decades ago the authors began to analyze the collections. This ongoing research covers two discrete Upper Mississippian ceramics assemblages and sequential village occupations, documents the site's unique architectural record, lays out new dietary information on late precontact agriculture, presents an extensive set of new <sup>14</sup>C dates, notes two distinctive mortuary patterns, defines the site's Terminal Late Woodland antecedents, and discusses its importance within the greater context of northeastern Illinois archaeology.

Emerson, Thomas [164] see Emerson, Kjersti

**Emery, Christina (Archaeological Research Institute), Benjamin Cross (Ohio State University) and Marcus Schulenburg (Archaeological Research Institute)****[65]***Neighbor Dynamics: Examining Intra- and Inter-structural Space Using Paleoethnobotanical Remains at an Early Fort Ancient Site*

The Guard site (12D29), an early Fort Ancient village, was occupied ca. AD 1000–1250 at the onset of the shift from Eastern Agricultural Complex (EAC) to maize agricultural subsistence. This period saw people experimenting with and implementing villages and year-round settlement centered around dependence on maize agriculture. Previous work on structures in Guard has shown that there are patterns in the material culture and subsistence practices across different parts of the village and throughout its occupation. A small-scale, additional study will add nuance to the preexisting dataset. Recent excavations have focused on two structures and an intermediate area. In this poster we examine the macrobotanical assemblages of intra- and inter-structural space in an attempt to identify any differential use of spaces. Currently, we have a limited understanding of the use of space at Fort Ancient villages, in particular in relation to household subsistence activities. This study, through its focus on paleobotanical remains found in both intra- and inter-structural spaces, allows us the unique opportunity to clarify future interpretations of spatial patterns at Fort Ancient villages.

Emery, Christina [114] see Comstock, Aaron

Emery, Kitty [85] see Delsol, Nicolas

Emery, Kitty [13] see Foias, Antonia

Emery, Kitty [96] see Thornton, Erin

**Eng, Jacqueline (Western Michigan University)****[10]***Bioarchaeological Perspectives on Human Adaptations to Life in "Marginal" Environments: High-Altitude Nepal and Beyond*

Humans have settled in diverse environments across the globe, though it may be their habitation of those areas that are characterized as "marginal" that underscores the behavioral plasticity and adaptiveness of our species in the face of extreme stressors. Such environments include those with limited resources, aridity, cold ambient temperatures, and hypoxic conditions at high altitude. Archaeological research in the high-altitude regions of northwestern Nepal offers insights into population history in the Himalayan arc through a multidisciplinary approach spearheaded by Mark Aldenderfer. The High Himalayas Archaeological Research Project in Upper Mustang, Nepal, includes multiple data sources: archaeological data and historic and ethnographic accounts, as well as evidence from ancient DNA, isotopic data, and bioarchaeological data. Together, these lines of evidence have enabled our team to address questions of migration, patterns of exchange, high-altitude adaptations, quality of life, and burial treatments. This paper highlights the bioarchaeological contributions to these reconstructions of community health, disease, and trauma in Nepal, as well as further considerations of human biocultural adaptiveness under "marginal" conditions that have carried over to other aspects of my research. These include studies of early populations of the Inner Asian steppe and Qinghai region.

Encore, Susan [56] see Baxter, Carey

**Eppich, Keith (TJC- the College of East Texas)****[59]***Death Monkeys in the Centipede City! Classic Maya Incised Monkey Designs in the Archaeological Context of El Perú-Waka,' Guatemala*

In a recent chapter, Prudence Rice argued that incised monkey motifs on ceramic bowls of the eighth and ninth centuries feature prominently in the mortuary contexts of the era. The present research explores this connection between simian iconography, death symbolism, and funerary deposits as expressed at the major Classic Maya city of El Perú-Waka.' A recent completion of a comprehensive ceramic catalog for the city allows Rice's hypothesis to be tested directly against the ceramics recovered from Waka,' the "City of the Centipede." Does simian imagery correlate to the mortuary ceramics of the Epiclassic Maya? Does it do so in

the same manner at Waka,' as has been studied in the Mirador region? What could be the connection between simian iconography and funereal ritual among the Classic Maya? What were the Death Monkeys doing in Centipede City?

Eppich, Keith [153] see Navarro-Farr, Olivia

**Erauw, Céline (Université libre de Bruxelles)**

[29]

*The Pyramids with Ramps of the Site of Pachacamac, Peru: Results from a Recent Archaeozoological Analysis*

Pachacamac is a major archaeological site on the central coast of Peru, occupied from the fifth to the sixteenth century AD. This presentation reports the results of a recent analysis of faunal remains recovered within the Pyramids with Ramps, the most prevalent structure type at Pachacamac. Twelve of the total 16 pyramids were excavated by the Ychsma Project (through the Université libre de Bruxelles) between 1999 and 2008. These pyramids were erected by the Ychsma during the Late Intermediate period and appropriated by the Inca during the Late Horizon. This study focuses on these two periods of occupation prior to Spanish conquest. The excellent state of preservation has allowed for the identification of the vast majority of the faunal remains. Most are domestic taxa (camelid, guinea pig, and dog) but wild terrestrial and marine species are also present. Several complete animal skeletons were discovered in the pyramids. This is the first instance in which the faunal remains from these excavation campaigns have been analyzed. It is also the most comprehensive zooarchaeological study of these pyramids to date.

**Eren, Metin (Kent State University), Michelle Bebbler (Kent State University), Briggs Buchanan (University of Tulsa), Alastair Key (University of Cambridge) and Stephen Lycett (University at Buffalo)**

[187]

*Antarctica as a "Natural Laboratory" for Conchoidally Fracturing Rock*

A long tradition of archaeological experiments has suggested that geologic, taphonomic, or postdepositional processes can produce lithic specimens that appear to be knapped or modified by primates. While these experiments serve as an important reservoir of interpretive cautionary tales, they can unavoidably lack aspects of realism given their experimental nature. Field studies of naturally flaked conchoidal rock could potentially complement these experiments, but the presence of primates in most locations globally cannot exclude the possibility that what archaeologists believe to be naturally flaked rocks are actually primate produced. Here, we propose that Antarctica can act as a "natural laboratory" for conchoidally fracturing rock because no primate species has ever occupied it. We present a series of lithic specimens from Antarctica that if found on their own or in an archaeological assemblage, could easily be mistaken for primate-produced artifacts. We discuss the future "archaeological" exploration of Antarctica for conchoidally fracturing rock, and the potential implications of true, naturally produced "look-alike" artifacts for the interpretation of controversial archaeological sites.

**Eren, Metin (Kent State University)**

[187]

*Chair*

Eren, Metin [57] see Boda, Seth

Eren, Metin [57] see Conrad, Grace

Eren, Metin [20] see Gala, Nicholas

Eren, Metin [20] see Mika, Anna

Eren, Metin [187] see Mukusha, Lawrence

**Ernenwein, Eileen (East Tennessee State University)**

[137]

*Moderator*

**Escalante, Kirsty (Tulane University)**

[62]

*Looting and Lidar: An Analysis of Illicit Digging in La Corona, Guatemala Using Airborne Laser Scanning*

Archaeologists have long known about the widespread looting of Maya sites, yet the remote environment and dense forest canopy of the Maya lowlands has prevented a systematic analysis via traditional field methods and aerial and satellite imagery. The application of lidar in archaeology within the last decade provides the first opportunity to visualize the ground surface beneath the jungle canopy and begin to understand the full extent of looting in this heavily pillaged region. Using lidar data from La Corona in Petén, Guatemala, this paper describes a GIS analysis of looting's distribution and the spatial relationships between looting and features of the natural and built environment. In addition to lidar, this research is supplemented by the previous excavations of La Corona archaeologists who have documented looting at the site and examined the methods employed to loot ancient Maya structures. Combining analyses of lidar data with previous investigations of looting at individual sites can generate a wealth of new information about threats to Maya archaeological heritage over an expansive region. This project therefore aims to quantify and analyze the distribution of looting in the Maya area to promote archaeological preservation and prevent looting, a persistent and widespread problem in this region.

**Escue, Claudia (William & Mary) and Jennifer Kahn (William & Mary)****[168]***Geospatial Analysis of Traditional Taro Farming, Rurutu, Austral Islands, French Polynesia*

Taro is the primary subsistence crop across much of Polynesia. Many argue that traditional taro cultivation connects Indigenous farmers to the land and their ancestors. Yet traditional taro cultivation is becoming increasingly rare as island economies rely more heavily on tourism and commercialized farming, and as imported foods replace traditional cultigens. Our research explores taro farming on Rurutu, Austral Islands, French Polynesia, where many farmers have maintained traditional subsistence practices from pre-European contact times to the present. Our Rurutuan case study investigates Kirch's Wet versus Dry hypothesis, which describes the relationship between environmental factors, agricultural choices, and the development of sociopolitical complexity throughout Polynesian chiefdoms. We use Landsat imagery and geospatial suitability analysis to locate 13 potential areas with dormant taro systems on Rurutu. Next, we estimate the island's probable annual taro yields and use such yields as proxy data to approximate the island's precontact population. Our results suggest significant intra-island variability in taro yields and broadly support the Wet versus Dry hypothesis in a Rurutuan context, as wetland agriculture supported large populations and the development of stratified chiefdoms. Finally, we discuss how our preliminary data contribute to contemporary conversations concerning food sovereignty and sustainable farming in Oceania and beyond.

**Esdale, Julie (Colorado State University, CEMML), Lisa Cipolla (Fort Hunter Liggett), Chuck Burns (Colorado State University), Sunny Wood (Fort Hood) and Erik Phillips (Colorado State University)****[56]***Site Capping as Mitigation on Military Training Lands*

The US Department of Defense (DoD) manages over 134,000 archaeological sites located on military training lands throughout the nation. Training using off-road heavy vehicle maneuvers in particular can create a lot of ground disturbance and be destructive to archaeological resources. Archaeologists and training area managers have been working together to find solutions for preserving archaeological sites while keeping areas open to training opportunities. Physically capping sites with removable materials is one such solution. This paper presents the results of a capping study at Fort Wainwright, Alaska, and provides capping case studies from Fort Hunter Liggett, California, and Fort Hood, Texas. This paper will explore issues with using site capping as a preservation tool, and discuss best practices for protecting cultural resources while supporting military training on DoD-managed lands.

Esdale, Julie [105] see Graf, Kelly

Esdale, Julie [56] see Skinner, Dougless

**Espinosa, Alicia (Université Paris 1—Panthéon Sorbonne, UMR8096)****[150]***About the Importance of Integrating the Chaîne Opératoire Concept into Ceramic Studies: The Case of the Virú and Moche Populations Cultural Affiliations and Contacts (Early Intermediate Period, Northern Coast of Peru)*

The development of archaeometric studies has allowed us to address with great detail the choices made by potters regarding the acquisition and preparation of raw materials. However, to better understand the social identity of potters, studies that take into account all the steps of the production process, and in particular the stages of shaping, should be conducted more often. Technological approaches, founded on the *chaîne opératoire* concept, have indeed proven their ability to reach an anthropological reading of ceramic material. These studies are particularly effective when it comes to questioning the affiliations between ancient societies by comparing the technical traditions of potters. To illustrate this method, we present our investigations into Virú and Moche ceramic production, which coexisted on the northern coast of Peru during the Early Intermediate period (200 BC–AD 600). The study of macrotraces, coupled with a petrographic study, reveals that these populations did not belong to the same community of practice, since they do not share the same technical knowledge. Nevertheless, they maintained frequent contact, as evidenced by the circulation of Moche ceramic vessels on Virú sites. These results lead us to reconsider the links between these populations, whose definitions are still debated.

Estève, Julia [181] see Hendrickson, Mitch

**Estrada Aguila, Rebecca (Vanderbilt University), Markus Eberl (Vanderbilt University), Phyllis Johnson (University of Kentucky) and Michael McBride (Hill Country Archaeological Association)****[206]***Testing Microdebitage Variability with Statistical Analysis*

As archaeologists expand their use of microdebitage analysis, addressing and documenting the assumptions made about microdebitage becomes more critical. One of these assumptions is that microdebitage is morphologically the same, apart from size, as macrodebitage. This study attempts to determine the extent macro- and microdebitage share morphological attributes and how they might vary. An additional objective is to understand which variables, if any, vary from one microdebitage size class to another. A soil particle analyzer was utilized to count and measure experimental debitage. The variables chosen for this analysis are based on established attributes to identify microdebitage: transparency and angularity, as well as variables measuring shape and texture. The results indicated significant statistical differences between the microdebitage and macrodebitage datasets. Our research also found there to be morphological variances between the microdebitage size classes.

**Estrada-Belli, Francisco (Tulane University) and Alexandre Tokovinine (University of Alabama)****[153]***In Search of the Kaanu'l Dynasty in Northeastern Peten: Recent Investigations at Holmul and Chochkitam*

Two of the Kaanu'l dynasty's strongest allies in the south during the sixth and seventh centuries were the kingdoms today referred to as Naranjo, in eastern Peten and Caracol, in western Belize. Since the discovery of Dzibanché's hieroglyphic stairway, it has also been evident that the Kaanu'l hegemony began with conquests and territorial expansion out of the city of Dzibanché, in southern Quintana Roo, although the locations and modalities of their initial expansion further south of the Mexico/Guatemala/Belize borders remain unclear. After the discovery of references to the Kaanu'l dynasty at Holmul, the hypothesis was formulated that other references with Kaanu'l's early expansion may be found at sites along a putative route running along today's Guatemala/Belize border. Recent work at Chochkitam, in northeastern Peten, uncovered new texts with royal titles identifying a previously unknown local dynasty and references to the Kaanu'l kingdom supporting the initial hypothesis regarding the possible Kaanu'l progression along the eastern Peten front during the early part of the sixth century.

Estrada-Belli, Francisco [11] see Balanzario Granados, Sandra

**Ethridge, Robbie (University of Mississippi)****[25]***Southeastern Indian Coalescent Societies: Origins and Questions*

Ethnohistorians and archaeologists studying the American Southeast have chronicled the collapse of the precolonial Mississippian world of chiefdoms with European colonization. However, Native people did not disappear. Rather, with this collapse we see Native survivors restructuring their social, political, economic, and cultural orders for the new colonial, and indeed, global, world in which they now existed. Scholars have called this process of restructuring "coalescence" and the societies that resulted "coalescent societies," because they were, in varying degrees, coalescences of people from various polities, language groups, and regions. These concepts have gained traction across much of North America and even beyond. This paper excavates the use of these terms and the understandings of them through the scholarship and proposes that the time has come to begin examining the variations of coalescence and coalescent societies in the American Southeast and proposes methods for beginning this work.

Evans, Adrian [162] see Waudby, Denis

Evans, Daniel [50] see Graham, Elizabeth

Evans, Jamie [161] see Kasper, Kimberly

Evans, Olivia [161] see Kasper, Kimberly

**Everhart, Timothy (University of Michigan Museum of Anthropological Archaeology), Jeremy Turner (Shawnee Tribe Cultural and Historical Preservation), Talon Silverhorn (Ohio Department of Natural Resources) and Bret Ruby (Hopewell Culture National Historical Park)****[196]***A Collaborative Contextual Approach to Scioto Hopewell Elk Canine Pendants*

Scioto Hopewell material symbols are iconic and world-renowned but evade simple interpretations of their meanings and uses. Almost all of these objects and contexts are known only from century-old legacy collections. Archaeological analyses of these are hindered by poor documentation, as well as intrinsic factors including their uniqueness, complexity, and rarity. Herein we advocate for collaborative contextual approaches or any approach that collaborates directly with members of descendant communities and works "bottom-up," tracing outward from associations made explicit within depositional contexts toward broader constellations of relations. We apply such an approach to a single class of Scioto Hopewell objects—drilled elk canine teeth. We examine several hundred excavated in 1920–1921 from three sub-mound structures at the Mound City Group in Ross County, Ohio. We begin with the objects' immediate relations (associated objects and architecture) and trace outward to the broader geographically, temporally, and socially conditioned relations between elk and Native peoples. Preliminary results provide unique insights into Scioto Hopewell sartorial practices, symbolic systems, and human-elk relations. Revisiting legacy collections with a collaborative contextual approach can benefit descendant communities by centering Indigenous perspectives in interpreting the meaning and significance of these assemblages, and improving the NAGPRA inventory process.

**Evgenia, Gelman (Institute of History, Archaeology and Ethnology of Peoples of Far East)****[135]***Discussant*

Expósito de Vicente, Cristina [18] see Vázquez de Ágredos Pascual, María Luisa

**Extract, Jonathan (University of California, Riverside)****[35]***A View from Above: An Iconographic Genealogy of the Representation of Space in Mesoamerica*

Landscape painting and aerial representations of space have been considered unique achievements of Western modernist art and science. However, running contrary to this narrative is the rich corpus of sixteenth-century Indigenous Central Mexican cartography, which contains both navigable geospatial scenes as well as immersive tableaus. Still, to date, archaeologists and art historians are unsure of whether the aerial views of these maps are prehispanic or a colonial-era appropriation of European conventions. In this paper, I provide an iconographic genealogy that demonstrates that aerial tableaus and landscape scenes extend from the sixteenth century back to at least Teotihuacan (ca. 250 BC–AD 650). Furthermore, I argue that although examples of landscapes and tableaus are present in the prehispanic record, they are just one among many strategies that were fluidly used in Mesoamerican writing. Central Mexican painters placed less emphasis on “naturalist” representation and rather used a conventionalized ideographic grammar to communicate complex spatial and temporal information. By clarifying this ideogrammatic spatial syntax, I will highlight examples of tableaus that have been overlooked in the prehispanic Codex Borgia and Codex Zouche-Nuttall.

**Eyerly, Sarah****[211]***Discussant***Fábregas Valcarce, Ramón (University of Santiago de Compostela, Spain), Carlos Rodríguez-Rellán (University of Granada, Spain) and Alía Vazquez Martínez (University of Santiago de Compostela, Spain)****[146]***Twenty Years After: A Program of Research on the NW Iberian Rock Art*

A favorite topic of reputed scholars for more than a hundred years, research on the Galician open-air rock art has experienced a remarkable surge in the last decades. A combination of intensive survey and review of gray literature allowed us to achieve a provisory tally of decorated sites that amounts to more than 3,500 effective. Furthermore, the application of new recording methods—namely photogrammetry—has led to a better knowledge of the carved pictographs, often revealing an as-yet-unknown complex iconography. Those advances have contributed to a better setting of those graphic expressions in their spatial and temporal framework, thenceforth paving the way toward the identification of the prehistoric groups—farmers undergoing swift socioeconomic changes—responsible for their execution.

Fábregas Valcarce, Ramón [187] see de Lombera-Hermida, Arturo

Fagan, John [198] see Mack, Joanne

**Fahey, Brian and Curtis Marean (School of Human Evolution and Social Change)****[68]***Testing the Accuracy of Two Methods Used to Estimate Minimum Number of Elements in Zooarchaeology*

The abundance of skeletal elements recovered from archaeological sites is often reported as minimum number of elements (MNE), a derived abundance unit that corrects observed specimen counts in an attempt to mitigate the effects of bone fragmentation and better reflect the originally deposited assemblage. Procedures to calculate MNE are complex and often subjective. Despite this, there has been little testing of the accuracy of published methods used to calculate MNE. This research tests the accuracy of two methods explicitly described in zooarchaeological literature, the fraction summation approach and the overlap approach. Both methods estimate MNE by counting the number of specimens displaying the same part of a skeletal element, and therefore necessarily originating from independent skeletal elements, but use different methods for recording shared portions of a skeletal element and tallying independent specimens. Accuracy of these methods is tested using an experimentally created sample of heavily fragmented bones that has a known actual number of elements (ANE). MNE values were calculated for this sample and are compared for consistency to each other and to the ANE to determine accuracy of each approach.

Faith, J. Tyler [204] see Davies, Benjamin

Falabella, Fernanda [18] see Ramírez Funes, Horacio

**Falucci, Armando (Eberhard Karls Universität Tübingen), Fotios Karakostis (Eberhard Karls Universität Tübingen), Dominik Göldner (Eberhard Karls Universität Tübingen) and Marco Peresani (University of Ferrara)****[187]***Identifying and Quantifying Morphological Separation between Blade and Bladelet Productions through 3D Shape Analysis*

Laminar blade and bladelet production technologies were adopted by Paleolithic foragers to produce a range of stone tools. Archaeologists have reconstructed the different reduction procedures involved in the production of laminar stone tools, often with an underlying a separation between the bigger blades and smaller bladelets. However, these two blank types are in most cases poorly defined because their classification typically relies on arbitrary size thresholds that do not consider blank shape, which is a fundamental component of tool production and function. In this study, we investigate whether traditional classifications of blades and bladelets are meaningful in terms of morphology. For this purpose, we employ a 3D geometric morphometric approach on a large sample of complete blanks retrieved from the early Protoaurignacian levels at Fumane Cave, in northeastern Italy. Our findings

highlighted distinct morphological tendencies across blank types, including a shape principal component that is significantly correlated with the 3D size of the artifacts. Furthermore, our discriminant function analysis on both size and shape variables correctly classified most artifacts, offering new insights into the technological organization of the Protoaurignacian. Overall, this study underlines the merits of combining shape and size data to explore the multivariate nature of lithic technology.

**Falgueres, Christophe, Norbert Mercier, Maïlys Richard, Olivier Tombret and Yossi Zaidner**  
[191]

*Chronology of the Paleolithic Site of Neshar Ramla (Israel) based on Radiometric Methods, Part 2*

In addition to the first series of radiometric dates published by Zaidner et al. (2021) that assigned an age between 120 and 140 ky for layers V and VI, a set of teeth and burnt flints coming from the upper part of the stratigraphy were studied using the same dating methods. The new results complement the previous ones and can be compared with OSL dates obtained on sediments. These data contribute to defining a chronological framework for a large part of the Neshar Ramla sequence. This framework can then be compared with those established for other Middle Paleolithic Levantine sites that yielded human remains. References: Zaidner Y., Centi L., Prévost L., Mercier N., Falguères C., Guérin G., Valladas H., et al. (2021) *Science*, 372, 1429–1433.

Falgueres, Christophe [191] see Mercier, Norbert

**Fan, Rong**  
[185]

*Settling Down in a Rich Environment: Reconstructing Energy Expenditure from the Human Skeletal Remains at the Jiahu and Beiqian Sites*

Humans as active actors interact with their environment in a myriad of ways. Some of these interactions, particularly those from food consumption and labor, leave markers on their skeletal remains. My research estimates energy requirements needed for daily living based on human skeletal morphology and measurements of lower limb bones of the early farmers at the middle Neolithic sites of Jiahu and Beiqian in northern China. These two sites were in distinct ecological environments. Jiahu is an inland site where the major consumption was terrestrial resources, while Beiqian is a coastal site where people intensively exploited both marine and fresh water resources. Using the site geography, faunal and floral assemblages previously reconstructed by other scholars, my research results indicate that the Jiahu and the Beiqian people settled at these sites because of their rich environment. In this kind of environment, the Neolithic people could acquire adequate resources to meet their daily energy needs within an hour walking distance range while pursuing labor-intensive activities. Integrating human behavioral ecology theories and osteoarchaeological approaches, my research provides perspectives on possibilities of why early agriculture started and how it proceeded, particularly in rich environment such as the Jiahu and Beiqian regions.

Fan, Wenquan [193] see Miller, Melanie

Fang, Hui [32] see Wang, Qingzhu

**Farace, Anthony (University of Florida) and Neill Wallis (Florida Museum of Natural History)**  
[39]

*Visualizing a Swift Creek Vessel Using Nano-CT and 3D Imaging*

Ancient pottery forming techniques in the American Southeast are often glossed under catch-all designations such as coiling. In reality, forming techniques were more complex than a single term implies, but conventional macroscopic analysis limits discovery of relevant evidence. With recent advances in computed tomography (CT) scanning, nano-CT presents a nondestructive methodology that allows visualization of the clay matrix of ceramic vessels, enabling identification and measurement of coils, molded layers of clay, slab joins, and evidence of other construction techniques that can help archaeologists delineate past technological choices relevant to communities of practice. This pilot project utilizes nano-CT to determine vessel forming techniques of a Woodland period Swift Creek Complicated Stamped vessel from Tharpe mound in Jefferson County, Florida. A carved wooden paddle was used to imprint a stamped design across the vessel's surface. The force applied in this finishing technique obliterated macroscopic evidence of vessel forming but did not destroy microstructural evidence observable beneath the wall surface. This analysis demonstrates that a combination of forming techniques were used, including coiling and drawing. The project also demonstrates the usefulness of nano-CT for the creation of 3D models and to compare to complimentary compositional analysis such as thin section petrography.

**Farah, Kirby (Gettysburg College)**  
[156]

*Archaeology and Local Biographies of Place in Xaltocan, Mexico*

The modern town of Xaltocan has been a locus of archaeological research by largely foreign archaeologists for over 30 years. This research has had sweeping effects on the ways in which locals understand and place value on their town's history and has sometimes shaped local narratives of the past. However, even with the considerable contributions of archaeological research, alternative biographies of Xaltocan's past endure and proliferate, preserved by family members and often shared widely across the community. This paper draws on ethnographic research to explore how and why alternative biographies of Xaltocan's past persist and considers how these biographies of place are strategically expressed to assert social and political power in the midst of radical regional changes. The research presented in this paper has been influenced by Wendy Ashmore, who expertly analyzed the vast entanglements and contingencies that make places socially meaningful.

Farahani, Alan [158] see Romo-Caballero, Carlos

**Fargher, Lane (Centro de Investigación y de Estudios Avanzados del IPN) and Marc Marino (University of Arkansas)**  
[220]

*The Political-Economy of Polychrome Pottery in Late Postclassic Tlaxcallan, Mexico*

Research at Late Postclassic (AD 1300–1521) Tlaxcallan documented an urban landscape consistent with collective action theory. Specifically, archaeological survey mapped a well-developed administrative structure that divided the city into a hierarchy of districts and neighborhoods. This structure was materialized through investment in plaza-temple complexes, surrounded by uniform residential terraces, and interconnected through a paved-road network. Excavations demonstrated that public buildings were nonresidential, that domestic architecture and spatial organization were highly uniform, and that wealth inequality was comparatively compressed. Recent research extended these observations by showing that imported obsidian was distributed across social sectors through an open market. Here, we use spatial distributions, petrography, INAA, and ED-XRF analysis of pottery to test hypotheses concerning the ways in which Tlaxcallan's political economy impinged on the production, distribution, and consumption of ceramics. Based on collective action theory, we hypothesize that multiple, local (and nonlocal) communities of production mass produced codex polychromes and monochrome ollas for distribution through an open market. Conversely, based on Neoevolutionary and agency theories, we alternatively hypothesize that (1) ceramic production and distribution were centrally controlled, and (2) polychromes were produced outside Tlaxcallan and/or through elite patronage and deployed in an elite gift-economy or distributed through a restricted market.

Fargher, Lane [62] see Antorcha Pedemonte, Ricardo

Farkas, Michael [15] see Pauketat, Timothy

Farnsworth, Kenneth [119] see Miller, G. Logan

Farrer, Andrew [111] see Weyrich, Laura

**Farris, Glenn (California State Parks, Retired)**  
[45]

*A Kashaya Village (SON-174) at Fort Ross in the 1840s–1850s: A Case Study in Historical Anthropology*

During the tenure of the Russian American Company at the settlement of Fort Ross (1812–1841) on the Sonoma Coast, a permanent village of Native Californians developed adjacent to this community. Previously, Kashaya villages were established upslope, out of the main fog belt, and the coast itself was only visited on a transhumant basis to gather foods from the sea at certain times of the year. Following the departure of the Russians, a German immigrant named William Benitz took over the area of Fort Ross and its hinterland. While he and his family lived there from 1843 to 1867, the local Indians were in danger of being seized by neighboring ranchers and so remained near the fort for their own protection. This is a study of their settlement, especially at site CA-SON-174, based on a combination of archaeological, archival, and ethnographic records. The aim is to present the contact history of the Kashaya presence via an approach using historical anthropology similar to that applied by Professor Kent Lightfoot in his own research at Fort Ross.

**Farshi, Golriz (University of Michigan)**  
[99]

*Gateways of Charity: Mongol Sacred Kingship in Fourteenth-Century Iran*

This paper explores charitable complexes built by Mongol Khans to historicize sacred kingship in thirteenth- and fourteenth-century Iran. As new converts to Islam, the Mongol Khans deployed divine symbols and rituals to lay claim on their ancestral lineage and the inherited mantle of the Islamic Caliphate. This project was not limited to the discursive realm but was embodied in the charitable cities the Khans endowed. These mausoleum-centered endowed charitable city-cum-sovereign was the material representations of the Khan's sacred kingship. Inspired by Buddhist temples and Sufi shrines dotting the landscape of the greater Mongol Empire, endowed cities came to define sovereign piety and authority, linking imperial legitimacy to the circulation of goods and people around the sacred body of the Khan. I examine and reconstruct the physical space of these cities from their extant endowment deeds, ruins, and remains to read the public performance of sacred kingship and the crafting of a new body politic. In specific, I explore endowed charitable cities built in or around Tabriz. I argue that these building projects, referred to as "gateways of charity," were the material representation of Mongol Islam that illuminated the confessional politics of shrine-centered kingship popularized in this period.

**Fauvelle, Mikael (Lund University) and Andrew Somerville (Iowa State University)**  
[222]

*Diet, Status, and Social Change in Southern California Fisher-Hunter-Forager Communities: Bayesian Mixing Modeling of Stable Isotope Values*

Over the course of the Late Holocene, the hunter-fisher-foragers communities of southern California's islands and coasts formed complex and wide-ranging political and economic systems underwritten by maritime trading voyages using sewn plank canoes. In order to better understand these important social and technological transitions it is useful to have robust data on how ancient dietary patterns across the region changed through time. This paper presents a new baseline stable isotope dataset for southern California

with a focus on marine plant and animal species. We use our baseline database to reevaluate previously published human stable isotope values from the region using Bayesian mixing models for dietary patterns. Our results show considerable regional variation in dietary change through time. Northern Channel Island populations display a distinct increase in reliance on finfish relative to shellfish while people from coastal areas show considerably more temporal continuity. Inland communities, on the other hand, show an increase in both finfish and shellfish consumption during the region's Late period. We contextualize these results with a discussion of how our models for dietary change in southern California can help inform the study of economic complexity and technological innovation in ancient fisher-hunter-forager communities.

**Fedick, Scott (University of California, Riverside) and Louis Santiago (University of California, Riverside)**

[96]

*Drought Resistance of Indigenous Food Plants of the Maya Lowlands: Complementary Physiological and Ethnographic Approaches*  
Droughts of varying intensity have been a regular, yet unpredictable, part of life in the Maya Lowlands for millennia, potentially disrupting agriculture and threatening famine. Ethnographic and ethnohistoric sources document a number of plants recognized by the Maya as continuing to produce food under drought conditions. Here, we compare this list with our physiological analysis of all 497 documented indigenous food plants of the Maya Lowlands, in which we identified many drought resistant species. By combining the ethnographic and physiological analyses with nutritional assessment, we propose a list of indigenous food plants that would best serve to provide an adequate food supply under various drought conditions. This aids in the interpretation of potential drought impacts on ancient Maya society, as well identifying an agricultural complex that could serve as a model for future community based resilience under conditions of drought and climate change.

**Fedoroff, Michael (USACE TNTCX/University of Alabama)**

[12]

*Methods of Inclusion: A Call to Decolonize Archaeological Methods in the United States*

The history and relationships surrounding the development of archaeology as a discipline in the United States are fraught with issues of racism, colonization, and state-sponsored ethnocide. Archaeologists have an impact on Indigenous groups in both positive and negative ways, especially in the United States, where collaboration and consultation had a dismal history. Until the passage of historic preservation laws in the twentieth century, few professionals solicited input from Indigenous groups on the significance, treatment, or stewardship of their material items—including human remains. In places across the globe where Indigenous groups do not benefit from any laws or protections, they remain under the tender mercies of Western researchers—often bearing muted witness to practices that differ little from colonial style extractions of material, knowledge, and labor from the community. Despite this sordid history, incremental changes in archaeology, both in the United States and globally, attempt to balance the power dynamic common in these interactions. This paper focuses on the emergence of new approaches to the project of the decolonization as it relates to archaeology in the United States.

**Fedoroff, Michael (USACE TNTCX/University of Alabama)**

[56]

*Discussant*

**Fehren-Schmitz, Lars (UCSC)**

[192]

*From Chavin to Machu Picchu: Paleogenomic Insights into the Population History of the Central Andes*

In recent years paleogenomic investigations have helped to increase our understanding of Central Andean population history. It comes with no surprise that some of this work has been influenced by and even initiated by Prof. Burger. Here we report on the genomic analysis of over 100 individuals buried at the iconic sites of Chavín and Machu Picchu conducted in collaboration with Prof. Burger and others. The genomes of individuals from both sites grant novel insights into long-range interactions between groups in the Andes in the Early and the Late Horizon, as well as into site specific patterns of genetic diversity and demography. By contextualizing the genomic data with the archaeological and historical record we will further address questions related to site function, kinship, and individual life histories. Using the aforementioned examples, we will then discuss both the potential and the challenges of paleogenomics to contribute to regional archaeological research in the Andes.

Fehren-Schmitz, Lars [177] see Brady, James

Fehren-Schmitz, Lars [177] see Verdugo, Cristina

Fehren-Schmitz, Lars [157] see Washburn, Eden

**Feinman, Gary (Field Museum of Natural History)**

[54]

*Discussant*

Feinman, Gary [188] see DeLance, Lisa

Feinman, Gary [54] see Thompson, Amy

Feit, Rachel [4] see Ingalls, Victoria

**Feldman, Robert (Field Museum of Natural History)****[194]***Discussant*

Feliu Beltrán, Núria [155] see Vidal-Lorenzo, Cristina

Felt, Cameron [66] see Niles, Erin

**Feltz, William (University of Illinois at Chicago) and Ari Caramanica (Vanderbilt University)****[115]***ENSO Events and Agricultural Terraforming in the Pampa de Mocan*

Pampa de Mocan is a 5,800 ha coastal desert plain bordering the Chicama Valley and the southern edge of the Pampa de Paján of Northern Peru. While regarded as unfavorable for farming, landscape technologies channeled drainage from ENSO floodwaters to increase agricultural production in this desert plain beginning around 900 BC. This poster will consider a 1,707 ha portion of the Pampa de Mocan to assess the movement of ENSO floodwaters. Drone data collected in 2016 and 2017 were analyzed through photogrammetric and GIS software to observe how floodwaters and sediments were redirected by ancient agricultural features. We compared the Digital Elevation Models (DEM) from both years (pre- and post-ENSO), and the conclusions point to how ancient farmers on the north coast of Peru used destructive events to serve their agricultural needs. Secondly, we would like to offer a methodology that can be applied globally for assessing the destruction and/or manipulation of climatic events.

Fenerty, Brendan [184] see Holliday, Vance

**Fennell, Catherine and Rebecca Graff (Lake Forest College)****[50]***Chicago's Wastelands*

Archaeology's analytical object may be "other people's garbage," as famously set forth by James Deetz. But this must also include the creative and even inadvertent reuse of excess, spent, and worked over materials in ways that force us to question what we ultimately even mean when we, as archaeologists, classify something as "waste." Drawing from several case studies in Chicago, this paper examines the social history of materials we commonly construe as "waste" but also cognate concepts like "rubble" or "ruin." Through cases centered on the repurposing of materials generated by Great Fire of 1871, the incorporation of architectural fragments into the façade of a high-profile building, and engagements with the compromised grounds of "vacant" residential lots, we argue for an understanding of "waste" that moves away from the negativity that inheres in this classification and instead foregrounds practical engagements with ambiguous and flexible material. We ask what, then, are the practical and analytical ends of "waste" and how might archaeological practice engage with material classified as such in a manner legible and ultimately useful across disciplines and for stakeholders?

**Ferguson, Jeffrey (University of Missouri), Suzanne Eckert (Arizona State Museum), Deborah Huntley (Tetra Tech) and Judith Habicht-Mauche (UC Santa Cruz)****[41]**

*Why Is the Grass Always Blue-Greener in Your Neighbor's Yard? Long-Distance Resource Acquisition at Goat Spring Pueblo, NM*

Research at Goat Spring Pueblo, a late Ancestral Pueblo period (AD 1300–1680) village located in the Rio Abajo region of south-central New Mexico, examines cultural continuity and transformation through the lens of movement—the movement of ideas, people, and objects. Part of this research is to identify long-distance social networks, and to place these into broader environmental and cultural contexts. Due to its geographic location and its multiple occupations throughout the Ancestral Pueblo period, Goat Spring Pueblo is an ideal focus for research on movement. The village is located at the border between Zuni and Piro lands and was situated along a trail that connected Western Pueblo and Rio Abajo villages. Further, the Goat Spring Pueblo is located within a day's walk of sources of obsidian, lead, and smithsonite, important raw materials for participation in Rio Grande exchange networks. Results for the isotope sourcing of lead in ceramic glaze paints, XRF analysis of obsidian, and XRF analysis of blue-green minerals recovered from Goat Spring Pueblo suggest that despite local access to each of these geological resources residents were primarily relying on material from more distant sources.

Ferguson, Jeffrey [150] see de la Fuente, Guillermo

**Ferguson, T. J. (University of Arizona)****[219]***Discussant*

Fernandez, Geraldine [124] see Jaimes Betancourt, Carla

**Fernandez, Rachel (Center for Digital Antiquity) and Charlene Collazzi (Center for Digital Antiquity)****[113]***The Digital Archive of Huhugam Archaeology (DAHA)*

The Center for Digital Antiquity at Arizona State University, in collaboration with the Amerind Museum, utilized a 2017 grant from the National Endowment for the Humanities to create a comprehensive digital library of archaeological investigations of the ancient Huhugam (Hohokam). The Digital Archive of Huhugam Archaeology (DAHA) now contains copies of more than 2,000 major archaeological reports, images, and datasets made accessible through tDAR (the Digital Archaeological Record), an established online repository that preserves and provides access to archaeological data. The DAHA collection provides scholars with crucial long-term data for comparative studies, Indigenous communities with access to a wealth of research on ancestral populations, and the general public with a reliable, vetted resource focused on Huhugam culture (1500 BC–AD 1450). In this poster we hope to illustrate how this project came to be and current outcomes, along with potential improvements for future projects.

**Fernandez, Rachel (Center for Digital Antiquity)****[36]***Discussant***Fernandini, Francesca (Pontificia Universidad Católica del Perú)****[189]***Deconstructing the Middle Horizon in the Central and South-Central Coast*

The period between 500 and 900 CE (end of Early Intermediate–Middle Horizon) is a dynamic and interactive period throughout the Andes. Particularly for the central and south-central coast, a series of local independent societies with strong cultural trajectories change their settlement pattern by agglomerating into fewer settlements, introduce nuanced ceremonial practices, and develop new ceramic innovations. These changes seem to be associated with a myriad of contemporaneous natural and cultural events such as a period of intense climatic alterations and the development and consolidation of a strong expansionist state in the southern highlands. While initially these changes were attributed to a direct Wari conquest/presence, research indicates that Wari presence was null in the area. In this talk, we will use a bottom-up approach to contextualize the central and south-central coast developments within the regional and wider Andean context to explore the Middle Horizon as a multidimensional phenomenon characterized by the coexistence of several regional developments.

**Fernandini, Francesca (Pontificia Universidad Católica del Perú)****[189]***Chair*

Fernandini, Francesca [92] see González Gómez De Agüero, Adrián

**Ferree, Tyler (University of California, Santa Barbara) and Gregory Wilson (University of California, Santa Barbara)****[15]***Spindle Whorls*

This paper examines variation in the scale and nature of textile production between Cahokia and other Mississippian societies in the Midwest by comparing variability of spindle whorl amounts, shapes, and sizes between these regions. The results of this research suggest that labor for the production of textiles was organized in a way that was fundamentally distinct in the American Bottom during the height of Cahokia's population and complexity. Textiles were produced on a larger scale in the American Bottom than in surrounding regions, but there is also compelling evidence that craft specialists produced textiles with a wider range of thread thicknesses and with a higher variation in raw materials. These results shed new light on variation in Mississippian political economies by demonstrating a clear difference in the organization of labor between Cahokia and smaller-scale polities throughout the Midwest.

**Ferrell, Morgan (University of Central Florida), Caroline Jasiak (University of Central Florida) and John Schultz (University of Central Florida)****[113]***Photogrammetric Point-Cloud Replicability When Documenting Forensic Archaeological Scenes under Variable Lighting Conditions*

Forensic archaeological scenes involving human skeletal remains in wooded environments can be challenging to document utilizing photogrammetry due to the complex nature of outdoor scenes. Previous research has demonstrated that changing lighting conditions can negatively affect 3D model quality. The purpose of this research was therefore to test the impact of variable lighting on the replicability of 3D point clouds using close-range photogrammetry in a wooded environment. One real-life scattered scene was created using a composite human skeleton and several clothing items. The scene was photographed three times during one day to capture changing lighting conditions: before 10:00 a.m. (Model 1), noon (Model 2), and 2:00 p.m. (Model 3). Photographs were collected freehand from multiple view angles using a Sony  $\alpha 7$  III camera with a fixed wide-angle lens, and the models were processed using Agisoft Metashape Professional. The dense point clouds were then analyzed using CloudCompare to assess point-cloud replicability between model pairs. The cloud-to-cloud distance tool in CloudCompare was used to calculate the mean distances and standard deviations between point pairs. Also, histograms that display these point-to-point deviations were generated for each model comparison, and a Gaussian (normal) distribution was fitted to each histogram for further analysis.

Ferrer, Alexa Ithxayana [20] see Huang, Cindy Hsin-ye

**Ferris, Jennifer (HDR) and Kerry Lyste (Stillaguamish Tribe of Indians)****[83]***Collaborative Archaeology: Recent Investigations at the Olcott Site*

Inadvertent disturbance to the Olcott Site, 45SN14, provided an opportunity for cultural resources management (CRM) practitioners and members of the Stillaguamish Tribe of Indians to complete site excavation and lithic analysis together. The Olcott site, first recorded nearly 60 years ago, was fundamental in defining the early to mid-Archaic period in western Washington, specifically along the South Fork Stillaguamish River and Lake Sammamish. Situated upstream from two named Stillaguamish villages, this was a heavily utilized hunting area for many thousands of years. A portion of the site was examined via controlled excavations and approximately 13 m<sup>3</sup> of back-dirt were screened to recover cultural materials. Tribal members were trained in field and laboratory techniques, and tribal interpretations of the significant cultural materials were shared with the archaeologists. This project exemplifies how important it is to engage in collaborative archaeology that furthers our understanding of material culture and the connection it has with communities today.

**Ferris, Jennifer (HDR)****[83]***Chair*

Ferwerda, Carolin [160] see Alperstein, Jonathan

**Field, Sean (University of Notre Dame) and Donna Glowacki (University of Notre Dame)****[152]***Reimagining the Far View Chacoan Great House Community*

As one of the main areas open to the public, many are familiar with the group of sites at Far View in Mesa Verde National Park, although much about them has been taken for granted. The complete excavation of buildings like Far View House and Pipe Shrine, and the ability to walk among them has led to misperceptions about the nature of this community and its role in ancient Mesa Verde society. For instance, some have questioned whether Far View was a Chaco outlier, thus excluding it from some early inventories of Chaco Great Houses. However, this and other inferences are based largely on what is actually only the eastern edge of this large ancestral Pueblo village. Preliminary results from new research conducted in the community shows a complex village organization. Not only do at least six large pueblos comprise the village core, but also there is platform construction, a predominance of enclosed kivas, a likely bi-wall structure, oversized kivas, and a possible great kiva. Additionally, new information on community roads and water management features indicate coordinated construction and maintenance. All of these findings point to a complex history of this community that was most active during the Chaco Era.

Field, Sean [173] see Glowacki, Donna

Field, Sean [208] see Portman, Katherine

**Figueroa, Alejandro (University of Missouri)****[101]***Rock Art Networks of Central Honduras: Insights from Iconography and Archaeometry*

Research shows that the chiefdoms of central Honduras followed different social and economic trajectories than neighboring state-level societies in Mesoamerica, such as the Maya, since at least the Formative period (ca. 2000 BC–AD 250). Rock art sites in this area, for example, include a standard iconographic style that traverses political and linguistic boundaries. However, existing characterization studies indicate these images were produced using different, possibly local, materials. This paper presents the initial results of a project seeking to identify local sources of iron oxides, namely ochre, and analyze the iconography and chemical composition of rock art motifs across central Honduran sites via pXRF, Raman Spectroscopy, and SEM-EDS. By combining contextual, iconographic, and geochemical datasets, this research aims to elucidate the internal and interregional social, political, and economic dynamics of these societies.

**Figueroa, Robert (Oregon State University)****[142]***Discussant***Filoromo, Steve, Alain Plattner (University of Alabama) and Elliot Blair (University of Alabama)****[8]***Building Community in Moundville's Chiefdom: New Insights from Geophysical Investigations of the Late Mississippian Platform Mound at Snow's Bend (1TU2/3)*

Platform mounds play an important role in community building in the Mississippian Southeast. In this paper we use noninvasive shallow geophysical methods to examine one such mound at the Snow's Bend site (1TU2/3), a single-mound center in Moundville's hinterlands. We identify construction stages and the internal structure of the single mound to understand community-building activities as shown through public architectural projects in the hinterlands. We use a multi-method approach to map the mound summit and profile. For the mound summit, we combine resistivity mapping with ground-penetrating radar (GPR). The mound profile is explored through a combination of electrical resistivity tomography (ERT), time-domain induced polarization (TDIP), and ground-penetrating radar (GPR) along a single transect. We identified subtle variations in construction stages and materials along a single depth-profile and extended these horizontally using the resistivity mapping results. Our approach showcases the utility of TDIP in

identifying subsurface archaeological features. Moreover, our work highlights the utility of multi-method shallow geophysics for exploring the complicated life histories of Mississippian platform mounds.

Filzmoser, Peter [149] see Brandl, Michael

**Finkel, Meir (Tel Aviv University) and Aviad Agam (Tel Aviv University)**

[149]

*Reconsidering Embedded Procurement: A View from the Lower Paleolithic of the Levant*

Binford's idea of embedded procurement, implying that lithic procurement was, in most cases, integrated into other subsistence activities, still governs the interpretations of many archaeologists dealing with Lower and Middle Paleolithic flint sourcing. Results from late Lower Paleolithic Qesem Cave and Lower/Middle Paleolithic Dishon and Achbara flint extraction and reduction complexes, Israel, suggest this concept better be reconsidered. Notable proportions of nonlocal materials were observed at Qesem cave, especially in specific typo-technological categories, demonstrating selectivity in acquisition and exploitation of different flint types. At the Dishon sites, a large number of flint extraction and reduction tailing piles were found, containing rejected hand axes and Levallois cores, implying the formation of task-specific expeditions, aimed specifically at an organized extraction and reduction of flint. Based on these observations, we will try to refute the embedded procurement approach's dominance and establish the existence of direct procurement beginning already during the Lower Paleolithic of the Levant. Furthermore, we will suggest, based on a review of relevant archaeological and ethnographic data, that cultural, social, and ontological aspects also played a role in the shaping the procurement of lithic materials among Lower Paleolithic populations.

**Finnigan, Lauren (University of Notre Dame)**

[39]

*Material Properties and Identification of Historic Brick in the Lower Great Lakes*

Historically, brick and masonry has been disregarded in the archaeological record, often being weighed en masse and discarded with fill dirt. This paper is the result of an extensive analysis into the material properties of historic brick in the lower Great Lakes former Lake Chicago basin and is intended to demonstrate the value of brick as an artifact class as well as to provide archaeologists, architects, and contractors with comparative data and analyses methods to facilitate brick identification in the field and laboratory. Brick samples were taken both in and ex situ in primarily urban areas along Lake Michigan in Chicago, South Bend, Milwaukee, Hobart, and Michigan from sites dated historically to the late nineteenth century. Samples were analyzed by color, texture, hardness, X-ray fluorescence, and in some cases, subjected to contemporary ASTM C67 compression strength testing. Results indicate that historic brick chemistry is too heterogeneous for pXRF comparison and that a multifocal analysis that combines color and hardness with other factors is the most effective method for historic brick identification.

Fischer, Christian [181] see Hendrickson, Mitch

**Fish, Suzanne (Univ. of Arizona)**

[118]

*Celebrating the Multifaceted and Collaborative Career of Paul Minnis*

Paul Minnis and Mike Whalen share an intellectual legacy as contemporary University of Michigan graduates at a time when archaeologists were using perspectives from expanded scales of settlement patterns to explore the interplay among environment, productive economies, and the development of societal institutions. Even before their decades-long Casas Grandes collaboration, Paul's Mimbres and Mike's Jornada Mogollon studies had already incorporated these scholarly trajectories. Such approaches continued to influence the broad scope of their joint Casas Grandes projects centered in northern Chihuahua. In Paul's case, the Michigan heritage of Volney Jones and Richard Ford also enriched his contributions to archaeobotany and the more inclusive field of paleoethnobotany. Throughout his career, Paul built his expertise through pan-Northwest/Southwest analyses of archaeobotanical remains and their context in subsistence and ecological systems. The broad-based outcomes of the joint Casas Grandes research are emphasized here, varying from the region's first documented domesticated chiles to the discrimination of "fields of power" dedicated to production for chiefs. In tirelessly advancing his disciplinary specialty, Paul Minnis taught and mentored, assumed national leadership roles, edited valuable thematic volumes, and authored authoritative treatments of overarching topics, most recently in his book addressing famine foods.

**Fisher, Chelsea (Washington and Lee University)**

[141]

*How the Archaeology of Traditional Ecological Knowledge (TEK) Can Counter "Unused Land" Narratives and Support Indigenous Maya Food Sovereignty*

In the Indigenous Maya cultural area, land grabbing actively undermines the food sovereignty of traditional farming communities. The Maya practice of milpa agriculture—based in the multigenerational-scale management of extensive forested lands—is at odds with the neocolonial logics of land privatization. As climate change and neoliberalism further erode the role of milpa, private developers cast Maya community forests as "unused land" in attempts to erode Indigenous land tenure. But the archaeology of those same community forests demonstrates just how integral they were, and are, to long-term agricultural resilience—even when they were ostensibly "unused." In this paper I discuss how archaeology oriented toward the origins and development of traditional ecological knowledge (TEK) in Maya forests can be leveraged to counter the "unused land" narratives underlying modern land grabbing in Yucatán, Mexico. Through archaeological investigations of precolonial farming settlements in the community landholding of Yaxunah, as well as TEK-based engaged work with Yaxunah community members, I explore possibilities for archaeology to

support Indigenous Maya food sovereignty by reaffirming community ties to agricultural landholdings and consider how these possibilities contribute to the pursuit of food sovereignty within the entangled North American and global food systems.

Fisher, Chelsea [34] see Dine, Harper

**Fisher, Philip (Washington State University)**

[83]

*Topographic Morphometrics and Flake Scar Patterns from Late Paleoindian Goshen and Plainview Projectile Points*

Topographic morphometrics uses 3D models of hafted projectile points to detect similarities and differences in flake scar patterns that result from tool production. These flake scar patterns are mapped at defined elevations on the faces of projectile point models to produce an isocontour, much like a contour line on a topographic map. In small Paleoindian hunter-gatherer populations, it is assumed that the knowledge and technique that goes into flintknapping would be socially transmitted from generation to generation. Based on assumptions from social learning and cultural-historic transmission of traditions it is expected that flake scar patterns should appear more similar within a small group of tool-makers that share a learning lineage than those produced by unrelated groups. With this data archaeologists can begin addressing the social relations of the makers of projectile point types from the archaeological record that look morphologically similar in outline shape. This study applies topographic morphometrics to examine the flake scar patterns of Late Paleoindian Goshen and Plainview lanceolate projectile points from the Great Plains. Results, in conjunction with other archaeological data, can be used to make inferences regarding how these Late Paleoindian point types from the northern and southern Plains may reflect cultural-historic traditions.

**Fitts, Lauren and Marie Meizis (Illinois State Archaeological Survey)**

[164]

*A Preliminary Report on Recent Findings along the Des Plaines River*

The Des Plaines River has long been a corridor between northern Illinois and the Mississippi River. The Northern Illinois Field Station of the Illinois State Archaeological Survey has recently undertaken a large-scale Phase I survey along a 9-mile section of the Des Plaines River for the Forest Preserve District of Cook County between Touhy Avenue and North Avenue. This survey resulted in the relocation of 15 known sites and the identification of 16 new sites. The majority of these date to the Upper Mississippian Langford phase, a complex that developed out of local Woodland traditions in northeastern Illinois, contemporary with Upper Mississippian Huber tradition sites to the south. Langford sites are interpreted as small horticultural villages located at or near the prairie:woodland interface. This paper reports results of the survey and discusses the implications of the presence of multiple small Langford sites, including site location and landform preferences, for previous models of upland Langford settlement patterns.

Fitts, Lauren [164] see Kelly, Jamie

**Fitzgerald, Curran (University of Wisconsin–Milwaukee)**

[29]

*Zooarchaeological Perspectives on the Organization of Domestic Space and Socio-environmental Entanglements at Las Peñas, a Late Intermediate Period Site in the Upper Moquegua Drainage of Southern Peru*

Households act as spaces for the quotidian interaction of people, animals, and cultural practices within a broader ecological setting. Due to the daily necessity of food, a focus on the spatial dimensions of faunal remains recovered from household contexts can provide a high-resolution lens on the organization of domestic space and the cultural practices of everyday life. In turn, these practices of domestic interaction with animals index landscape-scale environmental and social relationships through land-use regimes and long-distance exchange. This paper discusses the results of faunal and spatial analyses on the zooarchaeological assemblage recovered from household excavations at the Late Intermediate period (LIP) site of Las Peñas in the Torata Valley, part of the Upper Moquegua drainage of southern Peru. The spatial patterning of faunal remains in these domestic contexts points toward consistent organizing approaches to domestic space, and consistent and continuous food practices through time and space. Analyses of taxonomic abundance and element frequencies provide insight into social and status differentiation within the site, and evidence long-distance exchange relationships during a time period traditionally characterized by internecine violence and atomized, nucleated communities.

**Fitzhugh, Ben (University of Washington)**

[112]

*Moderator*

**Fitzhugh, William (Smithsonian Institution)**

[135]

*Discussant*

Fitzmaurice, Rosamund [172] see Watkins, Tia

**FitzPatrick, Mackinley (Harvard University), Ari Caramanica (Vanderbilt University), Ana Mauricio (Pontificia Universidad Católica del Perú) and Renata Verdun de Silva Carmo (Pontificia Universidad Católica del Perú)**  
[148]

*A Continental Divide: Barriers to Publishing in American Journals for Latin American Scholars*

Although the data published draws heavily from the region, Latin American scholars remain underrepresented in American archaeology journals. This paper is dedicated to exploring the potential barriers to publication by examining records from Peru and drawing on personal experience and observations. Specifically, the paper reviews the requirements of both professional organizations and the tenure process in the Peruvian academy, and the availability of funding and costs of publication. It also asks whether the ambiguity around a standard of writing style among American journals or reviewers may create an implicit barrier to publication. The analysis points to ways to increase the dissemination of Latin American research in American journals and better support students in the United States and abroad.

**Fitzpatrick, Scott (University of Oregon)**

[135]

*Discussant*

Fitzpatrick, Scott [19] see Napolitano, Matthew

Fitzpatrick, Scott [85] see Giovas, Christina

**Flad, Rowan (Harvard University)**

[148]

*Chair*

Flad, Rowan [148] see Alex, Bridget

Flad, Rowan [158] see Hirai, Nina

**Fladd, Samantha (University of Colorado Boulder) and Sarah Oas (Arizona State University)**

[49]

*Mealing Matters: Revisiting Women's Spaces as Counterpublics in the Pueblo Southwest*

Archaeological thought on women in the Pueblo Southwest revolves around questions of social organization and complementary ritual and economic roles to male activities. These discussions often fall into the trap of dichotomous thinking (e.g., male vs. female, public vs. private, domestic vs. political economies) and fail to critically examine the place of mealing spaces, rooms used for grinding corn or other food preparation activities, within pueblos. Through the location of this intensive and exhausting work, archaeologists theorize over the relative social power, or lack thereof, held by women in the region. We revisit this discussion to assess the ways Pueblo women utilized mealing and food preparation as complementary, transformative, and resistive performances. Using a case study focused on the changes to Pueblo culture in the thirteenth and fourteenth centuries, we examine mealing rooms as spaces for women to exist in between the private and public realms of the pueblo and exert power through influence over cuisine, mealing performance, and the treatment of the associated spaces.

Fladd, Samantha [152] see Oas, Sarah

Fleming, Wyatt [161] see Jones, Eric

**Fletcher, Emily**

[31]

*Creating a Software Methodology to Analyze and Preserve Archaeological Legacy Data*

Archaeology is experiencing a curation crisis. Much archaeological data sits dormant, inaccessible to most researchers. Computational techniques can revitalize this data by facilitating new analyses. However, the Digital Turn also presents a barrier to analysis: most legacy data is in an analog format that computers cannot interact with. These records must be digitized before computational analyses can be applied. To address this, I employ a software pipeline to digitize excavation records associated with the Gulkana site, which holds importance to the Ahtna descendant community and the continuing study of native copper innovation.

**Fletcher, Roland (University of Sydney), Sarah Klassen (Leiden University), Ben Dharmendra (University of Sydney), Paul Prevedoros (University of Sydney) and Scott Ortman (University of Colorado)**

[218]

*Scaling Effects in the Denser Occupation Areas of Greater Angkor: Patterns and Implications*

In Greater Angkor, denser clusters within the low-density urban complex display scaling effects of cumulative density with increasing cluster extent. By contrast, the overall areas of low-density, dispersed urban settlements do not display the scaling effect as is apparent for the Classic Maya urban settlements of the first millennium CE in Mesoamerica and for the Southeast Asian Mainland urban settlements from the mid-first to the mid-second millennium CE. It has, however, been noted that the central areas of the Classic Maya cities do display the scaling effect in relation to the population of the local region around a city. The analysis of clusters of occupation in Greater Angkor indicates that scaling is an effect associated more intensely with the denser, more connected portions of an urban settlement, leading to two key implications: (1) that the areal extent and density at which the scaling effect commences is critically important, and (2) that differential cumulation of wealth and innovation in the denser, well-connected

parts of a low-density urban complex due to the scaling effect is liable to create social disjunction within the entire settlement. These observations may have larger implications for the resilience of contemporary urban networks.

**Fletcher, Roland (University of Sydney)**

[181]

*Discussant*

[218]

*Chair*

Fletcher, Roland [218] see Vo, Thuy

**Flores De La Oliva, Luis Alberto (Universidad Nacional de Trujillo) and Gabriel Prieto (University of Florida)**

[129]

*New <sup>14</sup>C Dates Associated with the Early Intermediate Period and the Late Intermediate Period from Huanchaco, Moche Valley, North Coast of Peru*

A critical aspect of Andean archaeology is the chronological framework used by researchers to anchor their findings and subsequent interpretations. Although previous efforts have favored other approaches such as relative chronologies using ceramic sequences (often proven to be successful) or architectural sequences, it is always helpful to count with absolute dates. Fortunately, current investigations favor more funding for <sup>14</sup>C measurements, generating a better platform to establish absolute dating. This presentation discusses new dates obtained from archaeological excavations in Huanchaco, north coast of Peru. Deeply stratified sites occupied during the Late Early Horizon and the Early Intermediate periods have been excavated to explore the domestic occupations at residential fishing settlements. Some of these sites were later reoccupied for ceremonial purposes by the Chimú, who used these sites as the location for child and camelid sacrifices. This unique opportunity allowed us to measure 70 radiocarbon samples, all of them from primary context and belonging to short-term plants. The result is a refined version of the absolute dating for the Early Intermediate period, specifically for the Viru-Moche interactions during this timeframe. Similarly, we have new dates to interpret the rise and collapse of the Chimú Empire during the first millennium AD

**Flores-Blanco, Luis**

[51]

*Kaillachuro: The Roots of Monumental Architecture in the Titicaca Basin, Central-Southern Andes*

Monumental architecture in the Andes has been central to understanding the evolution of social complexity. Examples investigated in the central-south Andes have been from architecturally complex sites (e.g., Qaluyu, Pukara, and Chiripa) of the Middle Formative and Late Formative periods (after 3000 BP). Little attention has been paid to the earliest monumental constructions of the Preceramic period. From the site of Kaillachuro, a burial mound site discovered by Mark Aldenderfer in the late 1990s, I draw on data from my first season of excavation at the Kaillachuro site to investigate incipient monumentality. Preliminary stratigraphic and radiocarbon evidence indicate that monumental architecture in the Titicaca Basin began at the Terminal Archaic period, at least a thousand years earlier than previously thought, contemporaneous with the examples from the central coast of the Andes. Finally, I discuss whether or not this development was associated with the emergence of complex human institutions and what role the funeral rituals may have played in preceramic societies.

**Flores-Fernandez, Carola (Center for Advanced Studies in Arid Zones, Chile) and Daniel Hernández (Independent Researcher)**

[85]

*Shells as Fishing Tools from the Pacific Coast of South America (~7500–4500 Years BP)*

Fishing was a crucial aspect in the lifeway of coastal societies. Along the northern coast of Chile (18°–30° lat. south), fishhooks on *Choromytilus chorus* shells (mussel) appear in archaeological sites along 16,000 km during around 3,000 years. The chronological and spatial distribution of these artifacts, together with the wide but discontinuous distribution of mussel's habitats, arise interesting questions. In addition, archaeo-malacological assemblages along the northern coast of Chile vary in the abundance of *C. chorus* shells. In some places they are less than 1% and appear exclusively associated with the presence of fishing artifacts and ornaments. In other areas, mussel shells are highly abundant and an important food source. What are the correlations between mussel abundance and hook presence in the archaeological records of northern Chile? Were shells transported along the coast to supply places with low availability? The present study explores these questions through a literature review about mussel shell abundance in shell midden sites along the northern coast of Chile, and examines the potential of carbon and oxygen isotope analyses of *C. chorus* shells to evaluate the origin of the raw material and the social implications of its local or foreign origin.

**Flores-Muñoz, Julieta (Universidad Veracruzana)**

[35]

*Revisiting Tochan: Mapping the House of the Nahuas through Oral Narratives*

Mapping is the established practice through which people visually represent, explore, and share geographic understandings. While cartographic products have become the dominant medium for this, there are many ways of expressing spatiality, and within these lies a rich opportunity to understand different forms in which people create and acquire this knowledge, navigate, and understand their landscape. This research explores how Nahuas in Mixtla de Altamirano Veracruz, Mexico, build a specific understanding of the space called "house" and how this knowledge is transmitted orally over time. In doing so, this research demonstrates the potential that oral narratives have to inform and decolonize historical and archaeological spatial knowledge, and to help scholars reevaluate our own spatial thinking.

Flynn, Barrett [56] see Skinner, Dougless

**Fogelin, Lars (University of Arizona)**

[148]

*Power, Prestige, and the Self-Published Scholar*

In 2019, I released my self-published eBook, *An Unauthorized Companion to American Archaeological Theory*. In the two years since, the book has been downloaded more than 2,000 times. I am happy with the reception my book has received, but I have grown increasingly concerned about questions of privilege, prestige, and promotion that come into play with self-publishing. That is, the experience I had self-publishing as an established scholar is markedly different from that of an emerging scholar. I am old enough to remember the radically egalitarian promise of the internet and cynical enough to recognize the corporate hellhole the internet has become. Absent scholarly peer review, am I any more than an archaeological "influencer"? Absent a determined intervention, I can see no reason why archaeological self-publishing won't perpetuate and exacerbate the existing prestige hierarchies of traditional publishing. If traditional publishing is to be replaced or added to by self-publishing, archaeologists must address the problems of self-publishing rather than perpetuating the egalitarian naïveté of Silicon Valley in the 1990s.

**Foias, Antonia (Williams College), Kitty Emery (University of Florida, Gainesville) and Jeanette Castellanos (Universidad de San Carlos)**

[13]

*Classic Maya Officials and Governance: The Role of Secondary Officials in the Motul de San Jose/Ik'a Polity in Central Petén, Guatemala*

Classic Maya regimes of governance have attracted significant attention in recent years, but most attention has centered on the powerful divine/sacred kings. Less attention has been devoted to the officials below the kings or to their practices in governing. Excavations at secondary centers around Motul de San José will be conjoined with hieroglyphic texts about secondary officials from the Ik' Style polychrome corpus to shed light on the wealth and status, as well as actions and practices of secondary officials in the realm of the Ik'a lords during Late Classic times.

**Folan, William J. (Univ. Autónoma de Campeche), Joel Gunn (University of North Carolina, Greensboro), Pablo Mumary (UNAM) and Ma. Rosario Dominguez (Univ. Autónoma de Campeche)**

[11]

*Oxpemul at the Crossroads: Exploring Its Development*

The archaeological works developed in Oxpemul by Folan et al. have demonstrated a human occupation of the site since the Middle Preclassic. Oxpemul lies on a tributary of the Desempeño River along a transpeninsular route from Chetumal Bay to the west coast at Champotón and Edzná through the Champotón watershed. The possible use of these routes of exchange and communication could explain architectural and population growth during the Early Classic. In this sense, in 2009, at the SO group, two inscribed stela fragments were discovered whose iconography is associated with early powerful rulers that could have settled in the site taking advantage of the natural, political and social changes that were taking place in the regional area during this context. In this paper, through the analysis of archaeological materials and physiographic issues, we will explore the elements that could have determined the transition from Preclassic to Early Classic associated with the establishment of a dynastic lineage at the site.

**Folch, Ramon**

[199]

*Postclassic Sites in the Tepancuapan Area: A Preliminary Approach*

The region surrounding the Classic Maya city of Chincultik was inhabited continuously after the abandonment of the city; documents mention the settlement of Tepancuapa and oral traditions from the Tojolabal and Chuj mention the region as a disputed land in ancient times. Using data from previously known Postclassic and historic sites in Chiapas and Guatemala, a brief survey was carried out to identify sites and record pottery making in the vicinity of Lake Tepancuapan. Isolated finds in caves and offerings at Chinkultic have previously identified important Postclassic materials but no site has been reported in the area so far. Guided by locals from the communities of Yalmutz and Ojo de Agua, new sites with Postclassic domestic materials, defensive locations, caves, and rock art were identified. Comparative studies can then be carried out with neighboring regions and sites which have been sufficiently studied in the vicinity such as Margaritas and the Upper Grijalva River Basin. This site could bring new information to understand the problems surrounding the culture and eventually identity of the inhabitants on the Comitán region during the sixteenth century.

Foley, Sarah [66] see Niles, Erin

**Follensbee, Billie (Missouri State University)**

[70]

*Function Follows Form: Experimental Archaeology with Seashells and Formative Period Mesoamerican Jade Facsimiles as Textile Tools*

Many Formative period Mesoamerican jade artifacts are readily identifiable as ornaments, as they have clear counterparts in both form and function in later Mesoamerican cultures. Other such artifacts, however, have proven puzzling to scholars, who initially categorized them as "miscellaneous objects," "objects of unknown use," or "implements for mysterious unknown purposes." Scholars later tentatively identified some of these artifacts as facsimiles of bivalve seashells, as they illustrate rounded shapes and a hinge; replication studies, meanwhile, suggest that the jade facsimiles were functional as textile-making tools. In 2020, Andrew

Turner suggested that specific seashell species may be models for the jade facsimiles, astutely observing that some jade “spoons” are comparable with the Atlantic wing oyster. Ensuing research has now identified specific seashell models for several other jade artifacts, and experimental archaeology illustrates that, like the jade facsimiles, these seashells have forms that function well as tools for spinning, twining, and weaving.

Foor, Thomas [83] see Prentiss, Anna

**Ford, Anabel (UCSB)**

[126]

*Intensification Does Not Require Modification: Tropical Swidden and the Maya*

Agricultural intensification and the archaeological correlates are not obvious. Archaeologists want to equate capital-based investment and arable farming as the path to intensification. The presence of terraces to slow water or canals to drain water are methods to bring marginal lands into new uses. Labor-based economies, especially those of the Americas before European conquest, present an entirely distinct track toward intensification. Tropical settings in general, and the Maya in particular, demonstrate a mastery of nature, cultivating biological capital as a product of their culture with skill and fire. Embedded fields transform to forests in a poly-cultivation practice that emphasize how diversity prevails in the tropics worldwide. As with most traditional land use systems, the Maya milpa cycle reduces temperature and evapotranspiration, conserves water, maintains biodiversity, builds soil fertility, inhibits erosion, and nurtures people. These labor investments do not leave direct evidence on the landscape, save for the implicit density of settlement, yet the imprint of their management is in the forest landscape itself.

Ford, Anabel [54] see Horn, Sherman

**Ford, Ben (Indiana University of Pennsylvania)**

[161]

*Is That an Ore Chute?*

Historic accounts of Newport village (ca. 1790–1830) mention a chute for loading iron ore onto riverboats. The chute purportedly extended along a steep riverbank and was used to move western Pennsylvania iron ore to the Conemaugh River for shipment to Pittsburgh. Recent archaeological surveys at the site of Newport have identified a substantial stone and earth berm that modifies the riverbank slope. This poster explores the possibility that the berm is the foundation for the chute, discusses similar features at other sites, and suggests what the construction of this berm implies about the intent and perspective of the village residents.

**Ford, Paige (Arkansas Archeological Survey)**

[143]

*Betwixt and Between: Using Relational Approaches to Evaluate Borderland Assumptions in the Late Precontact Ozark Plateau*

Borderlands—as indirect and artificial constructions resulting from the delineation of environmental, political, and cultural boundaries—have been historically deemed as problematic or murky because they do not fit neatly within the categories that are used in archaeology to organize cultural worlds in the past. Problematically, archaeologists often assume that these cultural boundaries and borders are factual and all-encompassing, when they are often based on limited datasets that do not reflect the ways in which past communities built and maintained their relationships to surrounding groups. Since the material remains left by these peoples do not fit our categorical schema, many assumed borderlands remain unevaluated and understudied, meaning the people and communities residing in those areas are presupposed to embody the social characteristics of a borderland group—maintaining weak and diverse ties to surrounding cultural complexes. This paper aims to illustrate the importance of evaluating the taxonomies commonly utilized in archaeological research, especially at suspected cultural borderlands. As such, this research uses social network analysis on the ceramic manufacturing practices of Late Precontact communities residing within and surrounding an environmental area and assumed cultural borderland—the Ozark Plateau—to arrive at a more nuanced view of their regional relationships.

Ford, Paige [15] see Lambert, Shawn

Forest, Marion [225] see Allison, James

Fornai, Cinzia [191] see May, Hila

Fornós-Astó, Joan [108] see Llobera, Marcos

Forrest, Kathleen [66] see Niles, Erin

**Forste, Kathleen (Boston University), Amalia Pérez-Juez (Boston University), Alexander Smith (SUNY Brockport) and Paul Goldberg (Boston University and Tubingen University)**

[108]

*Preliminary Investigations of Andalusian Agriculture at Torre d'en Galmés, Menorca, Spain*

Across the Iberian Peninsula and Balearic Islands, archaeologists of the Islamic period (ca. eighth through fifteenth century CE) have investigated agricultural systems through the analysis of architectural, faunal, and plant remains. Current botanical evidence suggests relative continuity in the suite of legumes, naked wheats, and hulled barleys cultivated by people across the Roman, Late Antique, and Islamic periods, while the variety of fruits increased over time. These broad patterns are based on a patchwork of data that varies in quantity and quality across ancient al-Andalus. Such patterns, however, do provide baseline data against which individual assemblages can be compared. In this paper we present preliminary botanical results from 19 flotation samples collected from Islamic deposits at Torre d'en Galmés, Menorca during the 2021 field season of the Menorca Archaeological Project (MAP). Samples were recovered from a cistern and from the collapse of a domestic structure that was used as a dump after abandonment. Using these botanical data, we assess the preservation of macrobotanical remains in these deposits, identify the major cultivars, and begin to investigate cropping strategies employed by the medieval inhabitants.

Forste, Kathleen [108] see Smith, Alexander

**Fort, Casie, Katherine Grillo (University of Florida), Lindsay Bloch (University of Florida) and Steven Brandt (University of Florida)**

[94]

*Using pXRF Analysis of Ceramics to Determine the Nature of Holocene Inselberg Occupation at Three Sites in Southern Somalia*

Guli Waabayo Rockshelter is one of numerous sites discovered in the 1930s, 1940s, and 1980s on the Buur (Somali for "hill") Heybe inselberg ("the hill of the potters' sand") in southern Somalia. The nature of rockshelter occupation at Buur Heybe has been debated, with two primary models proposed to explain the site's Holocene deposits: 1) long-term occupation by sedentary hunter-gatherers and farmers, and 2) sporadic occupation by more mobile hunter-gatherer and/or pastoralist peoples. Portable X-ray fluorescence spectrometry (pXRF) of ceramics recovered from the rockshelter contributed important data to this debate, via identifying different paste recipes that may represent distinct production origins. Paste homogeneity could indicate either long-term or repeated occupation of the site by people(s) using ceramics produced entirely locally, while distinct recipes might indicate long-distance movement of ceramics resulting from either residential mobility or trade/exchange. Contemporary pottery from the Buur Heybe region was included as a proxy for local clay signatures. Further comparison was made with ceramics from nearby Gogoshiis Qabe Rockshelter and the open-air Rifle Range Site ~25 km SW of Buur Heybe. Our results emphasize the complex occupational history of this region and the significance of the sites to the people who produced the pottery.

Fortin, Julien [221] see Meacham, Samuel

**Forton, Maxwell (Binghamton University)**

[102]

*A Long Way From Chaco: The Mac-Stod Great House and Regional Rock Art Practices*

Great house structures are a hallmark feature of the Chaco World, used by archaeologists to map the extent of Chaco's influence across the Colorado Plateau. The Mac-Stod great house in Petrified Forest National Park is a solitary Chaco-style structure on the geographical margins of the Chaco world. Mac-Stod is a poorly understood structure, and the degree and nature of Chacoan influence it exerted on local populations is unknown. A notable feature of Mac-Stod is the abundant petroglyphs marking the surrounding mesa slopes. One possible means of measuring the impact and singularity of Mac-Stod is through comparing/contrasting the content and context of Mac-Stod's rock art with sites in Chaco Canyon and non-great house sites in Petrified Forest. Similarities between Mac-Stod and Chaco Canyon's rock art may reflect shared iconographic practices of a larger Chaco World. Conversely, if Mac-Stod's rock art bears similarities to the non-great house communities found throughout Petrified Forest, then whatever Chacoan influence embodied in Mac-Stod had limited impact on the local population. This study gauges the impact of Chaco structures on local communities through assessing largely understudied and underreported iconographic data found in rock art sites.

Fossile, Thiago [64] see Colonese, André Carlo

Foster, Cher [154] see McKillop, Heather

**Fox, Amy (University of Toronto)**

[216]

*Whose Tools: Broadpoint Typologies of Northeastern North America*

Northeastern North American regional typologies define three related types of broadpoint: the Atlantic point in the Maritimes and New England, the Snook Kill point in New York and Ontario regions, and the Lehigh/Koens Crispin point in the Susquehanna and Delaware River valleys. Each point existed at the same time and was made on locally available raw materials. A sample of 246 broadpoints all defined regionally as one of those types is studied using 2D elliptical Fourier outline analysis. Using a principal components analysis, the point types are compared for differences in shape. What results is a complete lack of defining characteristics that would separate the types. A history of Archaic period research is taken into consideration to explain the reasons that these point types were initially separated and not considered the same type. What results is a critical examination of historic

practice, specifically the role that conceptual archaeological tools such as typologies play in the construction of world- building over archaeological time.

**Fox, Jacqueline (Logan Simpson) and Travis Cureton (Logan Simpson)**

[208]

*Recent Rediscoveries of Hohokam Multistory Architecture in the Phoenix Basin*

Archaeologists working in the Phoenix Basin have recently relocated the position of a Hohokam multistory integrative feature within the village site of La Plaza (AZ U:9:165[ASM]) that was destroyed in 1895. Data recovery excavation at that location has revealed foundational elements of these unique pieces of architecture, including wall footers and features related to their construction. This presentation summarizes newly recovered data to explore how these Classic period Hohokam integrative facilities functioned.

**Fracchia, Adam (University of Maryland)**

[205]

*Behind the Curtain of Ruin: Exploring the Many Meanings and Uses of Baltimore's Urban Landscape*

Like other postindustrial East Coast cities, the landscape of Baltimore is marked by blocks of vacant homes and sections of the city ranging from impoverished to affluent. Areas of the city have seen disinvestment and neglect and show a ruined landscape that has been contextualized differently by various groups and for different purposes. For many, these neighborhoods are a sign of urban decay and represent a contagion or prove a racist ideology. In such a climate of fear, residential differentiation has been heightened and opportunities lost for collaboration and community. Archaeology operates within this environment and value system, having the opportunity to support current paradigms or illustrate the definitions and alternative uses of ruins.

Fracchia, Adam [169] see Wadford, Tabatha

**Frchetti, Michael (Washington University in St. Louis)**

[122]

*Discussant*

France, Christine [201] see Aguayo, Esther

**Franco, Nora (CONICET-IMHICIHU and University of Buenos Aires-FFyL)**

[76]

*Knowledge Acquisition and Its Importance to Understanding Technological Changes: Some Examples from the South of South America*

Chronological hiatuses and technological changes are frequent in Central and South Patagonia from the Pleistocene–Holocene transition to the Late Holocene. The presence of chronological hiatuses has been related, in most cases, to the existence of arid periods. The presence of technological changes can be due to several factors, such as environmental changes, reorganization of human populations, and the entrance of new human groups. The existence of human population replacements has been identified on cultural and genetic bases in at least one case in the Late Holocene. The importance of knowledge acquisition for people entering a new space in order to provide additional information about the reason for lithic technological changes is discussed for different cases in central-south Patagonia. They are analyzed using an organization of technology perspective within an ecological evolutionary framework. The results obtained do not allow us to discard the possibility that, at least in one of our cases, the lithic technological changes identified may be related to the entry of new human groups, which is likely possible because of the huge spaces and low population densities involved.

Frank, Jacob [126] see Langlie, BrieAnna

**Franklin, Elaine**

[190]

*Discussant*

Franklin, Hayward [41] see Phillips, David

**Franklin, Paris (University of Wyoming) and Todd Surovell (University of Wyoming)**

[57]

*The Carbon Footprint of an Archaeological Excavation*

Archaeologists regularly study how development projects will impact the environment and how climate change affects existing cultural resources. Less often do we reflect and determine how we could potentially be contributing to climate change through our own work. This paper seeks to estimate the average environmental impact of a long-term data recovery project using data from the La Prele Mammoth site, an ongoing excavation in Carbon County, Wyoming. We use records of crew numbers, mileage, and consumption of nonrenewable resources such as food, water, and gas purchases between the 2015 and 2021 seasons to estimate the total carbon dioxide equivalent produced by the project. We use these data to accomplish three things: (1) Use carbon

accounting to determine the average consumption of nonrenewable resources per person per day while on an excavation. (2) Build a model that can be applied to other excavation projects. (3) Suggest ways to make long term data recovery projects more sustainable. Overall, we aim to help principal investigators and crew chiefs plan future projects in a more responsible and environmentally conscientious manner.

Franks, Rob [41] see Agostini, Mark  
Franks, Rob [41] see Duff, Andrew

Frederick, Charles [116] see Koenig, Charles

**Freeman, Andrea (University of Calgary)**

[190]

*Employing Digital Technologies at Archaeological Sites for Education and Tourism*

Educators, museum curators, and heritage site managers moved quickly to employ a variety of digital tools during the height of the COVID-19 pandemic in order to service students and the general public. In this paper, I explore some of the ways in which virtual classroom assignments and virtual tourism were employed. I also describe the resources available, including GoogleEarth, ArcGIS, and structure from motion software to determine what digital technologies can be used for virtual tourism and virtual education. I acknowledge not only the limitations of these technologies, but also provide an understanding of where and when to employ accuracy and the challenges of shared resource use. Critically, I also investigate why institutions may choose to embrace or decry the use of these tools in the future.

Freeman, Jacob [47] see Gil, Adolfo

**Freiberger, Julia (University of Nevada–Las Vegas) and Debra Martin (University of Nevada–Las Vegas)**

[173]

*The Use of Fire for Ritualistic Destruction and Purification of Highly Fragmented Human Remains*

The ways in which humans interact with fire is unique to us, no other animal manipulates fire as we do. Fire has not only been used as a weapon of total destruction, but many cultures use fire as a form of ritualistic destruction. In the Puebloan world fire has been used as a form of purification, ritualistic closure of sites and ritualistic punishment. There have been suggestions that prehistoric Puebloan cultures practiced witch burning as an act of purifying and exorcising evils. Burning and ashes serve a critical role in many Pueblo ceremonies and curing rites. Highly fragmented human remains have been collected at numerous Ancestral Puebloan sites. A large number of these skeletal collections have shown evidence of burning, yet the use of fire and the patterns and reasoning regarding the burning of these remains is still highly debated. An examination of ethnographic literature about Puebloan witch execution, as well as the ceremonial act of burning a whole village to restore cosmic balance in the world, ceremonial site closure using ash, and even anthropophagy, should be examined as an explanation for the burning of the highly fragmented human remains found at multiple sites.

Freidel, David [188] see Rich, Michelle

**Freire, Shannon (University of Wisconsin–Milwaukee) and Catherine Jones (University of Wisconsin–Milwaukee)**

[178]

*The Scrapbook: A “Conundrum of the Archives”*

Analysis of the twice-excavated Milwaukee County Poor Farm Cemetery (MCPFC) has documented several types and varieties of postmortem skeletal modification attributed to autopsy and medical dissection. These interments have been associated with the local medical establishment, including medical and dental colleges. Following a consolidation of Milwaukee’s medical colleges in 1913, Marquette University became the sole institution of medical and dental education during the final years of the cemetery’s use. This may have coincided with a change in mortuary behavior as recent research has identified a reduction in the complexity of burials in the northeastern section of the cemetery used between 1918 and 1925. Critically, fewer anatomized individuals are represented archaeologically in this section than are documented historically. In order to explicate these behavioral changes in the archaeological record, Marquette University archives were utilized to provide data about contemporaneous anatomical teaching practices and the subsequent disposition of remains. Central to this research is a dental student’s scrapbook, replete with the ephemera of “bright college days.” This historical document, a vital window into the entanglements and processes that produced the MCPFC, has created as many questions as it answers.

**Freire, Shannon (University of Wisconsin–Milwaukee)**

[178]

*Chair*

**Freiwald, Carolyn (University of Mississippi), Claire Ebert (University of Pittsburgh), Julie Hoggarth (Baylor University) and Jaime Awe (Northern Arizona University)**

[157]

*An Archaeometric Ethnography of Maya Dog Management in the Eastern Lowlands*

The dog is the world's oldest domesticated animal and the main domestic species in the Maya region. Dogs served many purposes, from hunting partners in life, to food, tools, and offerings after death. They also show aspects of human mobility that may differ from migration. Dog remains were not evenly distributed across space or time, but findings of long-distance exchange and variable diets leave questions about how the species was managed. This study builds an archaeometric ethnography of dogs from western Belize for 2,000 years, from the Preclassic through Terminal Classic periods. Strontium, oxygen, and carbon isotope values from tooth enamel identify the animals' origin and diet, and X-rays and dental morphometrics their ages-at-death. The uniformly young animals had origins in western Belize and highly variable diets across time. These data hold broader significance for studies that use dogs as surrogates for human diet and mobility, as well as for understanding Mesoamerican domestication and animal management strategies. Dog mobility closely tracked that of humans from the same sites, but diet did not. The lack of old individuals may reflect a management strategy and provides a useful measure for other commonly used species and animal management in the Maya region.

Freiwald, Carolyn [130] see Le Moine, Jean-Baptiste

Freiwald, Carolyn [53] see McNeil, Cameron

French, Jennifer [17] see Nowell, April

**French, Kirk (Pennsylvania State University)**

[133]

*Moderator*

**Freund, Kyle (Far Western Anthropological Research Group), D. Craig Young (Far Western Anthropological Research Group), Lucas Martindale Johnson (Far Western Anthropological Research Group), Daron Duke (Far Western Anthropological Research Group) and M. Kathleen Davis (Far Western Anthropological Research Group)**

[187]

*What Is an Obsidian Source? Implications for Provenance Studies*

The answer to the question of, "What is an obsidian source?" may seem straightforward, but for archaeologists it is often difficult to define concisely. A review of the literature reveals that sources can variably be defined by their geology, geochemistry, and/or geography. For example, a source can represent an eruptive event or a series of eruptive events in a defined area, focusing on the formation processes that lead to visibly discrete strata. Sources can also be defined by their geochemistry, using statistical techniques to reveal discrete groups. Lastly, a source can represent a collection locality, a definition that emphasizes human behavior and the specific locations where people procured raw materials. There are benefits and shortcomings to each of these definitions, and this paper explores the topic in further detail, using case studies from around the world to highlight how the answer largely depends on the research questions being addressed.

Freund, Kyle [206] see Davis, M. Kathleen

**Friberg, Christina (Indiana University Museum of Archaeology and Anthropology) and Gregory Wilson (University of California, Santa Barbara)**

[8]

*Reconceptualizing Mississippian Society: Consolidation and Collapse in Cahokia's Western Frontier*

How should archaeologists conceptualize the boundaries and organizational configuration of Mississippian societies? The answer depends on the scale, character, and impact of the social, political, and economic dynamics that connected indigenous groups across the precontact Midwest and Southeast. To engage with these issues, we summarize research on the Mississippian period occupation of the Big River Valley in the Ozark Highlands of southeast Missouri, approximately 100 river km southwest of the Cahokia site, the largest and most complex precontact Indigenous society north of Mexico. This region represents yet another mode of Cahokia-related Mississippian settlement that extends beyond the polity's traditionally conceived regional boundaries. We present data on two geographical scales: (1) an examination of the Long Mound and Village site (23Je9) in the Big River Valley, a little understood mound center with strong ties to Cahokia; and (2) a diachronic summary of regional patterns of settlement. We argue that the Mississippian society of Cahokia comprised a number of different contiguous and discontinuous settlement areas, with various modes of organization and interaction. We also contend that diachronic changes in the settlement and use of the Ozark Highlands on the western edge of Cahokia's frontier provide important clues to the society's consolidation and collapse.

Frie, Adrienne [69] see Raab, Bailey

Friedman, Erin [78] see Look, Cory

Friedman, Richard [152] see Weiner, Robert

**Fries, Eric (UNLV)****[54]***Inequality at the Aguacate Sites, Western Belize, as Expressed via the Gini Coefficient*

Settlement in the Aguacate region of western Belize is characterized by closely spaced minor centers of roughly similar size and architectural elaboration. The social organization of the region has consequently been viewed as heterarchical in nature with relatively low inequality between centers. However, residential structures associated with these centers vary considerably in size, and the variation in configuration and size of these structures also appears to have a spatial component. Thus, the Gini coefficient provides a tool for assessing intrasite inequality within the settlement associated with each minor center, as well as comparing the degree of inequality present at each center and within the region as a whole. Of particular interest is the variation between settlement zones closely clustered around monumental architecture, as compared to settlement groups located in remote areas such as the Zibal North group.

Friesen, T. Max [78] see Thornton, Taylor

**Frost, R. Jeffrey (California State University, Stanislaus)****[103]***To Follow the Sun: Solar Observations in Precolumbian Costa Rica*

Precolumbian societies throughout the Americas positioned temples and other architectural constructions to observe astronomical events. While such practices are well established ethnographically in Colombia, where solar observations have been used to mark time and maintain ritual calendars, evidence for astronomical observations has not been identified archaeologically in other regions of the Intermediate Area. Recent research demonstrates that many late period (ca. AD 900–1500) centers throughout central and southern Costa Rica include one or more architectural constructions oriented to observe solar horizon events including summer and winter solstices, equinoxes, and the zenith passage. As case studies to illustrate these patterns I present data from Nuevo Corinto, Cubujuqui, Rivas, and Guayabo de Turrialba.

**Frost, R. Jeffrey (California State University, Stanislaus)****[103]***Chair***Fruhlinger, Jake (Idaho National Guard)****[56]***Chair***Frykholm, Soren (University of Michigan) and Karla Aguilar (Zona Arqueológica de Monte Albán)****[123]***Narrativas del paisaje en Oaxaca*

En esta presentación investigamos las "líneas narrativas" modernas asociadas al paisaje en Oaxaca, incluyendo la percepción del tiempo y las actividades rituales que se llevan a cabo en los sitios arqueológicos. Nos enfocamos en la "herencia viva" y exploramos prácticas culturales de larga data asociadas con el mundo físico, tanto natural como construido. En particular, evaluamos las actitudes, interpretaciones y prácticas rituales asociadas con Monte Albán, la antigua capital zapoteca, y sus periferias.

Frykholm, Soren [220] see Whittington, Stephen

**Fuchs, Peter (Free University of Berlin), Renate Patzschke (Free University of Berlin) and Jesus Briceno (Ministerio de Cultura, Trujillo, Peru)****[3]***From the Sunken Plazas to the Entombment of Temples: Architecture and Ritual at Sechin Bajo, Peru*

The constructive tradition of Sunken Plazas represents one of the main components of the formative architecture in the Central Andes. In Sechin Bajo, a site in the Casma valley, north-central coast of Peru, this tradition can be traced back to the middle of the fourth millennium BCE. Here a sequence of four structures, partly built over one another, could be documented and dated by over 70 radiocarbon samples. The first structure consisted of a platform with a series of five sunken plazas constructed successively and dating all to the fourth millennium BCE. Within the following construction activities, dating up to ca. 1500 BCE, traces of feasts during the different structures and their renovation phases could be documented.

Fulton, James [132] see Zori, Colleen

**Fulton, Kara (University of North Texas)****[159]***The Value of Team-Based Learning in an Asynchronous Online Archaeology Course*

Teamwork is a skill that many employers value, yet studies suggest college graduates rarely excel in this area. Since teamwork is not unique to any one discipline, it can be incorporated into nearly any type of course. We, as instructors, can provide students with multiple opportunities to practice collaborating in teams, receive peer and instructor feedback, and positively contribute to improving

student competencies. Further, studies have shown that collaboration provides additional social, psychological, and academic benefits. Team-Based Learning (TBL), an evidence-based collaborative teaching strategy, is one way of incorporating collaboration and teamwork into classes. This poster presents a case study for how TBL was implemented in a high enrollment (approx. 160 students), online, general education introductory archaeology course. I will discuss the TBL process that was used (including assignment formats/timing and team formation) and provide tips for incorporating TBL online. Additionally, I will examine student perceptions about their own skills and the course content, collected through a pre- and post-survey within the class.

**Furlong, Julia (Arizona State University)**

[160]

*Modeling Prehistoric Population and Cultural Change throughout the Plateau of Northwestern North America*

Investigating trends in human paleodemography, combined with paleoenvironmental data, is becoming more and more common. This study aims to investigate human paleodemography of the Plateau culture area of northwestern North America through time as it relates to a changing environment and cultural landscape. Summed Probability Distributions of radiocarbon dates, used as a proxy for population density, will be plotted alongside major climatic trends and major technological and cultural transitions throughout the Plateau. Radiocarbon dates accessed from tDAR (the Digital Archaeological Record) will be used in tandem with spatially gridded climate data from PaleoView, an open-source dataset used to generate and view paleoclimate data at a global scale with fine temporal resolution. By comparing these datasets, insights into past human adaptations to the landscape can be investigated throughout the Plateau. Population density data will be parsed into three regions, the Canadian Plateau, the Southern, or Columbia, Plateau, and the Eastern Plateau, to understand differences within the greater Plateau culture area focusing on changing cultural adaptations through time and between regions.

**Gaffney, Vincent**

[137]

*Discussant*

**Gaggioli, Amanda**

[205]

*Discovering a Catastrophic Day: The 373 BCE Helike, Greece, Earthquake and Its Aftermath in Cultural Memory and the Socio-natural Landscape*

Earthquakes have been linked to disaster, abandonment, and ruin throughout the past. However, since ancient times humans living with persistent geological hazards have demonstrated forms of resilience. The 373 BCE earthquake in Helike, Greece, remained one of the most famous disasters in Greco-Roman culture. Its cultural memory into modern times influenced archaeological research, which had centered on desires to locate the earthquake ruined and submerged city as it had been described in ancient sources. Excavations, however, have revealed that Helike was not decisively destroyed in the 373 BCE earthquake. In fact, settlement of Helike has been continuous, since the third millennium BCE, despite high seismic hazards. An analysis of the cultural memory of the 373 BCE event and the socio-natural residues of Classical (early fourth century BCE) and also Hellenistic (late fourth century BCE) Helike settlement remains reveals not only resilience but more significantly a political ecology of human-earthquake relationships. Cultural decisions negotiated environmental conditions, political leadership and organization, economic resources and production, and cultural values. The case of Helike reveals cultural continuity and change in the aftermath of earthquakes and associated seismic hazards that complicates preconceived notions of landscapes of disaster, ruin, and social downturn resulting from earthquake hazards.

Gagnon, Celeste [29] see Torres Morales, Genesis

Gaikwad, Nilesh [18] see King, Adam

Gaikwad, Nilesh [89] see Skaggs, Sheldon

**Gaines, Alisha (Florida State University) and Natalie King-Pedroso (Florida A&M University)**

[27]

*In the Wake of Evergreen: Teaching after the Plantation*

Through the experiences of two literature professors "on the dig" at Evergreen Plantation in Edgard, Louisiana, this talk addresses an innovative pedagogical approach to teaching Afro-Southern literature. Theoretically framed by Christina Sharpe's question in "In the Wake: On Blackness and Being": "how does one memorialize chattel slavery and its afterlives, which are unfolding still?"; it considers how the archaeological dig, the material culture produced by it, and the nonmaterial aspects of folk culture shared by the community's residents promote and support illuminating interdisciplinary discussions both in and beyond the classroom.

Gaitán Ammann, Felipe [193] see Wesp, Julie

Gajardo, Javiera [200] see Uribe, Mauricio

**Gala, Nicholas, Stephen Lycett (University at Buffalo) and Metin Eren (Kent State University)****[20]***Knapping Injuries: A Survey of Modern Knappers*

The craft of producing stone tools by percussion (knapping) is widely regarded to be an activity that can cause injuries. New knappers are encouraged to wear safety equipment to mitigate these risks. However, how dangerous is knapping exactly? We conducted an anonymous survey of 174 modern knappers (IRB approved), and asked them to describe the frequency and severity of their injuries while knapping. We report the result of this research, and discuss its implications for experimental archaeology and the evolution of flaked stone technology.

**Galaty, Michael (University of Michigan)****[147]***Discussant*

Galaty, Michael [147] see Mehmetaj, Haxhi

Galaty, Michael [147] see Schultz, Julian

**Galeazzi, Fabrizio (StoryLab, Anglia Ruskin University)****[10]***Online Collaborative Infrastructures and 3D Visualization for Documentation, Analysis, and Preservation in Archaeology*

Digital tools and data infrastructures have been rapidly introduced to archaeological and heritage practices throughout the past decades; however, the role played by 3D documentation and visualization in the development of the field is not yet thoroughly explored. This paper discusses the impact and potential of applied 3D technologies in the development of new methods and practice with a particular emphasis on real-time data recording and collaborative infrastructures that provide the possibility of publishing spatial data and related datasets online. Starting from the experience acquired during the development of the ADS 3D Viewer, a web-based visualization platform for the analysis and archiving of 3D data integrated within the Archaeology Data Service repository, this presentation intends to open a discussion on the impact that online infrastructures can have on archaeological practices and clarify: if the development of online 3D collaborative platforms on-site can make data instantaneously available and integrated to support online study, analysis and verification of hypotheses; and how visualization and virtual manipulation of 3D representations of archaeological stratigraphy during excavation may increase collaborative and interpretative processes in the day-to-day fieldwork practices.

**Gallaga, Emiliano (UNACH)****[86]***The Mogollon from the Other Side: New Research from Chihuahua*

In the 1970s, the publication of *Casas Grandes: A Fallen Trading Center of the Gran Chichimeca* by archaeologist Charles Di Peso made a massive wave across the Mogollon sea and adjacent areas. This eight-volume publication illustrated that prehispanic communities from the Mexican side of the border were as complex as those far-better studied in the American Southwest. However, despite nearly 50 years since Di Peso's publication, for many years, Paquimé has seemed an isolated island in this Mogollon sea. Lately, several archaeologists from both sides of the border, and their research, have demonstrated that not only was Paquimé not as complex as originally thought, but more importantly, that it was not an isolated cultural event within the Chihuahuan region. In fact, the region was more connected through repeated interactions with their Mogollon neighbors north of the border than previously statements indicated. This paper presents some of this recent research conducted outside Paquimé and demonstrates that this region had a vibrant and more complex cultural development with more evident northern connections than suggested.

Gallagher, Rebecca [20] see Lillios, Katina

Gallareta Negrón, Tomás [34] see Parker, Evan

**Galvan, Melissa (Tulane University) and William Ringle (Davidson College)****[34]***Early Monumentality in the Puuc Region, Yucatán*

Recent investigations in the Puuc region of Yucatán have revealed an occupation spanning from the early Middle Preclassic to the Late Classic period. Lidar supported survey and excavations at different sites within the region revealed an intense and complex early occupation, driven by highly productive soils and attested to by an unusually dense network of monumental construction present in different communities. In this paper, I present new archaeological findings from the sites of Muluchtzekel and Uchebenmul. Our ongoing research indicates that monumental construction began as early as the Middle Preclassic period and that these architectural spaces were the foci for some of the first public gatherings in the Puuc region. Though early sites of different sizes have been identified, there does not appear to be any clear hierarchy of settlement organization during this time. Our findings also offer an opportunity to explore the early social and political networks of the Puuc region and its interaction with the remainder of the northern Maya Lowlands.

**Galvan Benítez, Miguel Angel****[73]***Manejo del agua en el conjunto monumental de Atzompa, Oaxaca*

La recolección y almacenamiento de agua pluvial es una de las prácticas más antiguas en Mesoamérica. La investigación arqueológica en diversos sitios ha permitido la identificación y documentación de sistemas de canales, depósitos subterráneos, galerías filtrantes y almacenamiento en recipientes, el sistema de desagües y el más común que son los depósitos a cielo abierto. En el caso específico del Conjunto Monumental de Atzompa, los estudios arqueológicos sobre el aprovechamiento del agua de lluvias no han sido extensos, sin embargo, gracias al hallazgo en una de sus primeras temporadas, se logró identificar y estudiar un elaborado sistema de conducción y depósito de almacenamiento de agua. En la presente ponencia se exponen valiosos datos sobre la captación, distribución y usos de las aguas pluviales en la parte sureste del sitio, dando cuenta de cómo la planeación urbanística de Atzompa iba de la mano con la solución al problema del abastecimiento de agua en el lugar.

**Gamble, Erin (University of Washington)****[139]***Pottery Production, Use, and Identity at Hamanaka 2, Rebun Island, Hokkaido, Japan*

This paper discusses the production and use of ceramic technology at the Hamanaka 2 Site on Rebun Island in Northern Hokkaido, Japan. Manufacture techniques, paste composition, and temper of 112 sherds are analyzed using thin section petrographic analysis and pXRF. These data are then used to discuss changes and/or continuities between stratigraphic layers to examine how local expressions of identity can be visualized and quantitatively analyzed. We then use the geochemical and elemental data to conduct preliminary analysis on relationships between local goods and trade goods and their influence on identity. From these three datasets, we propose a model for the formation of the Okhotsk Culture. This model suggests that engagement in commodity economies by first millennium hunter-gatherers in Northern Hokkaido was a risk-mitigation strategy that led to the formation of the Okhotsk Culture.

**Gamble, Lynn (University of California, Santa Barbara)****[131]***Discussant***Gancz, Abigail (Pennsylvania State University), Sterling Wright (Pennsylvania State University) and Laura Weyrich (Pennsylvania State University)****[111]***Archaeological Dental Calculus Sampling Strategies: Best Practices for Archaeologists*

Dental calculus is a nonrenewable and informative substance for answering archaeological questions about health, diet, and culture. With the rise in demand for destructive analysis, we sought to evaluate and improve the ways in which researchers document and sample this material. Specifically, our goal was to determine how researchers sample dental calculus, what types of skeletal and dental metadata they record, and how they specifically account for contamination. To do this, we sent out a digital survey to over 110 international organizations and individuals involved in dental calculus research. Our findings suggest that researchers have highly variable approaches to metadata collection, sampling strategies, and contamination controls. These differences, which seemingly arise from intellectual siloes associated with diverse training and academic backgrounds, pose a serious challenge to research reproducibility and collaboration. Without appropriate and well-documented metadata, archaeological inquiries cannot fully harness biomolecular techniques to answer questions about the past. Using the results of our survey, we suggest an updated list of guidelines for dental calculus recording and sampling practices, as well as freely downloadable sample recording sheets. We hope that standardizing and streamlining the recording process will help increase access and strengthen interdisciplinary research of dental calculus.

Gancz, Abigail [111] see Weyrich, Laura

Gandy, Devlin [89] see Robinson, David

Gandy, Jennifer [116] see Wernecke, D. Clark

Gang, David [18] see Zimmermann, Mario

**Gann, Savannah and Crystal Dozier (Wichita State University)****[39]***Starch in Deflocculation: The Effects of Calgon on Ancient Starch Recovery*

Calgon, or sodium-hexametaphosphate, is a rapid and inexpensive way to clean artifacts that have been recovered from archaeological sites. Soaking artifacts or sediment samples in Calgon is a common deflocculation process, most often with a 5% solution. While Calgon is still used in laboratory and field settings today, ancient starch research suggests that the deflocculant may cause granule damage, changes in morphology, and reduction in starch quantity, which would greatly impact interpretations of starch analysis. The following study tested the effects of Calgon on starch recovery by soaking a mixture of *Lycopodium* tracer spores and common cornstarch in a 5% deflocculant solution over different lengths of time. Preliminary results suggest that Calgon

can significantly reduce the number of starch granules recovered from samples. This research has important implications for ancient starch recovery and research methods.

Gann, Savannah [69] see Blair, Zoe

**Garbellano, John Michael**

[67]

*Hudson River Shell Middens: New Realizations at Dogan Point*

This poster explores cultural and environmental evidence for the earliest occupation and use of shellfish and other resources along the Hudson River Estuary, specifically at the Dogan Point site. Dogan Point is one of the oldest (if not the oldest) shell midden sites in the northeast and greater Atlantic region of North America. However, the site's boundaries, presence and absence of shell, and relationship to Early and Middle Archaic adaptations and human-environmental relations have not been fully realized. My research is focused on answering questions about these topics, and this poster discusses and shows the preliminary results of my fieldwork and post-fieldwork analysis during the summer and fall of 2021 and winter of 2022. I discuss the idea of ancient human-ecosystem relations and adaptations that developed at Dogan Point and allowed Early and Middle Archaic peoples to survive through periods of rising and stabilizing sea levels. I also discuss and show the areas where renewed excavations took place as well as what was found. Lastly, I lay out the next steps of my research for 2022–2023, the methods I intend to use, and why.

García, Chris [66] see Duwe, Samuel

**García, Dante (Zona Arqueológica de Monte Albán)**

[73]

*La élite política y social de Atzompá en el complejo urbano de Monte Albán*

Uno de los principales aportes del Proyecto Arqueológico del Conjunto Monumental de Atzompá (PACMA) es el conocimiento y documentación de las residencias habitacionales de la élite social, política, económica y religiosa del barrio de Atzompá durante el clásico tardío (600–950 dC). La residencia Casa de los Altares es el conjunto habitacional más complejo dentro de los tres que han sido explorados en este sitio. Esta ponencia se enfoca en señalar cada uno de sus componentes arquitectónicos y la importancia de su organización espacial en las relaciones de poder establecidas con los demás componentes urbanos y sus ocupantes. En este sentido, cobra importancia integrar en una misma lectura la interpretación de las diferentes ofrendas, consistentes en objetos de cerámica, lítica pulida y tallada, y otros materiales, que dan cuenta del pensamiento cosmogónico y religioso, de las dinámicas económicas, políticas y sociales que desempeñaron los actores sociales que habitaron los espacios de este complejo residencial.

**García, Dante (Zona Arqueológica de Monte Albán)**

[73]

*Chair*

García, Everett [66] see Duwe, Samuel

García, Percy [189] see Cusicanqui, Solsiré

**García-Des Lauriers, Claudia (California State Polytechnic University, Pomona)**

[128]

*Text, Place, and Landscape: Los Horcones in Teotihuacan's History of Interactions*

Among Karl Taube's most enduring contributions to Mesoamericanist archaeology is his work on Teotihuacan writing. At the site of Los Horcones on the Pacific coast of Chiapas, several monuments are inscribed with Teotihuacan style linear texts and represent one of the largest corpuses outside of the great metropolis. In this paper, I would like to revisit these texts with an eye for how they not only record time, but also space and place. I propose that these monuments are critical to Los Horcones' identity as a place where Teotihuacanos played an important economic and ideological role. In addition, glyphs on these monuments may ultimately represent toponyms for the site of Los Horcones itself portrayed in Central Mexican style writing.

**García-Des Lauriers, Claudia (California State Polytechnic University, Pomona)**

[128]

*Chair*

García Patzán, Dora Maritza [11] see Kovac, Milan

**Gardner, A. Dudley (Western Wyoming College)**

[57]

*Eagle Rock Shelter's Diverse Macro-botanical and Faunal Assemblage during the Paleo Period*

Eagle Rock Shelter, in west central Colorado, contains a ladder stratigraphical sequence from the Paleo period (13,000 BP) to Late Prehistoric period (105 BP). The faunal assemblage during the Paleo period at the site (13,000 to 9000 BP) contained

evidence of use of small game, fish, birds, and deer sized mammals. The macrobotanical assemblage indicates both berries and cacti were processed during Paleo occupation of the site. Subsistence data from the Paleo horizons are reviewed and suggestions for further analysis of macro floral materials recovered from the deposits in the shelter are presented.

**Gardner, Jonathan (Edinburgh College of Art [University of Edinburgh])**

[50]

*Gaining Ground: Demolition Waste as Raw Material*

Cities have always been built with and upon the remnants of their predecessors. Vast quantities of rubble produced through demolition, conflict, and natural disasters underpin nearly all places of habitation as part of a globe-spanning anthropogenic deposit that Matt Edgeworth has called the “archaeosphere” (2015). While such material is considered “waste” in the sense of a “left-over” or unwanted substance, in the immediate aftermath of deconstruction or destruction such rubble rarely remains “wasted” for long, instead usually being rapidly reused in new cycles of construction. While small-scale architectural salvage and “spolia” are well recognized archaeologically, the reuse of bulk quantities of demolition rubble in the creation of new or altered terrain is rarely discussed. It is the investigation of such landscaping processes, where rubble acts as the primary “raw material,” that is the subject of this paper. Employing a contemporary archaeological methodology, I trace how demolition waste has been used to radically alter the landscape using examples from the UK and, in particular, acts of land “reclamation.” In exploring the history of such sites, I also examine how this creative reuse of waste material necessarily disrupts taken-for-granted assumptions and assertions about the value of particular materials and places.

**Gardner, Jonathan (Edinburgh College of Art (University of Edinburgh))**

[50]

*Discussant*

[50]

*Chair*

Garg, Ketika [149] see Chauhan, Parth

**Garland, Carey (University of Georgia), Victor Thompson (University of Georgia), Matthew Sanger (Smithsonian Institution) and Karen Smith (South Carolina Department of Natural Resources)**

[79]

*A Multiproxy Assessment of the Impact of Climate Change on Estuarine Resources for Late Holocene (ca. 4500–3800 BP) Native American Villages of the Georgia Coast*

This study combines Bayesian chronological modeling with high-resolution climate and cultural datasets to understand the nature and timing of environmental change correlated with the emergence and abandonment of Late Archaic period (5000–3000 BP) shell ring villages on Sapelo Island, Georgia. Our models indicate that Native Americans occupied the shell rings at varying times with some generational overlap. By the end of the complex’s occupation, only Ring III was occupied before abandonment ca. 3845 BP. Ring III consists of smaller oysters harvested from less saline estuaries compared to earlier occupations. These data, when integrated with recent tree ring analyses, show a clear pattern of environmental instability throughout the period when the rings were occupied. We argue that as the climate became unstable around 4300 BP, aggregation at shell rings provided a way to effectively manage fisheries that are highly sensitive to environmental change. However, with the eventual collapse of oyster fisheries and subsequent rebound in environmental conditions ca. 3800 BP, people dispersed from shell rings, and shifted to non-marine economies and other types of settlements. This study provides the most comprehensive evidence for large-scale environmental changes that drove societal transformations on the Georgia coast during the Late Archaic period.

**Garrett, Zenobie (University of Oklahoma) and Erin Crowley-Champoux (University of Southern Maine)**

[40]

*Irish Ring-Ditches: A Multivariate Approach*

In Irish archaeology the term ring-ditch is applied to a type of site that is circular in appearance, but due to taphonomic and/or anthropogenic processes the function of the site is unknown. Over 1,100 have been identified through remote sensing and archaeological monitoring, but fewer than 100 have been excavated. Many are assumed to be plowed out funerary monuments; however, they have also been interpreted as round houses and other more modern types of features. Complicating the picture further is that while ring-ditches are traditionally associated with the Irish Iron Age, sites of this type have been found that date to all periods of prehistory up through the medieval period. This poster will explore what role multivariate analysis can serve in the understanding and interpretation of this seemingly ubiquitous, but enigmatic site type. Can environmental and construction variables help refine and improve our understanding of what ring-ditches are? To what extent can the limited excavation data be extrapolated and applied to unexcavated sites? Finally, how can multivariate analysis inform future research into ring-ditches and provide guidance for archaeologists and heritage officers?

Garrison, Andrew [117] see Barket, Theresa

**Garrison, Thomas (University of Texas at Austin) and Edwin Román (University of Texas at Austin)****[128]***Legitimizing a Wandering Axis: Articulating Symbols of Authority and Centrality in a Mobile Maya Court*

Karl Taube has consistently connected his analyses of Mesoamerican iconography to concepts of centrality and kingship. Temples, hearths, trees, and the divine royal body itself could all be marked with symbols of the axis mundi, the center of the world through which cosmological power flows, to be channeled and manipulated on behalf of the kingdom. But what happens when circumstances force a dynasty to shift its physical center of authority? How can royal authority be legitimized through its connection to the cosmological world center when the earthly center is relocated? The answer lies in the articulation of symbols of kingship and centrality at a landscape scale, linking sequent foci of power through architectural alignments and rituals relating to death and renewal. This paper examines the mobile Maya court of the Pa'ka'n dynasty of El Zotz that ruled from different locations in the Buenavista Valley of Guatemala for several centuries. The Pa'ka'n kings may have moved their dynasty as many as five times in the course of its history, and each relocation would have required symbols and rituals of legitimation, assuring that the royal connection with the divine center was still intact.

**Garrison, Thomas (University of Texas at Austin)****[11]***Discussant*

Garrison, Thomas [104] see Clark, Morgan

Garrison Darrin, Ann [64] see Holcomb, Justin

**Garvey, Raven (University of Michigan), Lauren Pratt (University of Michigan) and Kaitlyn Poe (University of Michigan)****[129]***Cumulative Culture versus Radiocarbon Gaps in Peru: A Case for Un-muddling the Middle*

As in other world regions, the Peruvian middle Holocene (middle/late Preceramic period; ca. 9–4 kya) is understudied relative to other periods. Archaeologists increasingly recognize, however, that humans' environmental modifications and demographic trends during this period created the landscapes and conditions necessary to support developments of the Early Formative and subsequent periods, including the transition from exclusively wild-foods diets to diets centered on domesticates. Our meta-analysis of previously published radiocarbon dates suggests several impediments to a more complete understanding of the Peruvian middle/late Preceramic; namely, uneven geographic and stratigraphic representation. Based on patterns revealed in neighboring regions as a result of increased attention to the middle Holocene, we suspect that addressing these imbalances in Peru will dramatically improve our understanding of the periods and places historically at the core of Central Andean archaeology. "Un-muddling" the middle Holocene will, moreover, contribute to a clearer understanding of hunter-gatherer adaptations more generally.

Gastélum Strozzi, Alfonso [174] see Ibarra López, Miguel

**Gates St-Pierre, Christian (Université de Montréal), Marie-Annick Prévost (Archaeological Services Inc.), Karine Taché (Université Laval), Iris Lee (Université de Montréal) and Camille Després-Coulombe (Université de Montréal)****[109]***An Integrative Approach to the Study of Ancient Foodways: A Case Study from the Iroquoian Isings Site, Quebec*

The Isings site is a small Iroquoian village from the late fourteenth or early fifteenth century located in Southern Quebec. It represents the earliest sedentary settlement discovered so far in this area, yielding evidence for the construction of permanent dwellings (longhouses) and for the cultivation of domesticated plants such as maize and squash. However, food products obtained from collecting, fishing, and hunting activities remained important in the daily diet of the inhabitants of the site. In this paper, we will illustrate how a combination of paleobotanical, zooarchaeological, and biomolecular analyses through a holistic and integrative approach provides a more complete reconstruction and understanding of ancient foodways.

Ge, Yun [156] see Taube, Karl

**Geiger, Elspeth (University of Michigan)****[141]***From Fire to Fruit: Opportunities for the Integration of Archaeological Data with Anishinaabe Wild Harvests*

Over the last decade there has been a growing recognition that most landscapes in North America were created and maintained through Indigenous fire regimes. This paper discusses the intersection between contemporary Anishinaabe fire management initiatives, food sovereignty, and archaeological data. Ethnographically, Indigenous peoples have used intentional forest burning to promote the growth of underbrush, berry patches, and mast-producing trees. As initiatives among tribes in northern Michigan, like the Center for Cooperative Ecological Resilience, explore these practices, there are opportunities to move beyond wildfire management and into food sovereignty. Access to affordable food and access to healthy food options are a substantial focus among tribes in northern Michigan. The wild harvest of berries has huge potential as a means of self-determination and medicine. However, to implement fire management techniques for the benefit of wild harvests, it requires an understanding of forest ecology pre-European influence. Excavations from the Cloudman site in northern Michigan have yielded data on the species composition of plant communities in the precontact, and the utilization of the local forests by Anishinaabe ancestors. Considering this research, there are new opportunities to combine archaeological data with contemporary goals.

**Geiger, Elspeth (University of Michigan)****[141]***Chair***Geller, Pamela (University of Miami)****[156]***Compassion as Archaeological Praxis*

Compassion, Thích Nhất Hạnh explains, is a verb. It includes intellectual or vicarious identification with another person's or group's experiences. Empathy is then translated into moral action. Though this engaged Buddhist has little, if anything, to say explicitly about archaeology, in this talk I meditate on the applicability of his ideas for its practitioners. I argue that archaeology must make the practice of compassion—in classrooms, meeting spaces, field sites—a central part of its disciplinary ethos. We do not have to look far for examples on which to build. Wendy Ashmore's legacy is instructive for fostering an archaeology of compassion at a pivotal moment in the discipline's history. Clearly, the queries she posed about the past remind us of how intellectually productive it is to unearth different ways to be human. Just as important were her lessons in kindness, mentorship, and diplomacy in present-day social interactions. To take up this subtle praxis might help the discipline reckon with its long-standing, systemic sexism and racism, which is foundational but not inevitable.

**Geller, Pamela (University of Miami)****[193]***Discussant***George, Richard (University of California, Santa Barbara), Weston McCool (University of California, Santa Barbara) and Douglas Kennett (University of California, Santa Barbara)****[51]***Modeling Climate-Population-Conflict Relationships in the Maya and Nasca Regions*

Understanding the influence of climate change and population pressure on human conflict remains a critically important topic in the social sciences. Yet studies that systematically quantify the relative effect of these variables among prehistoric populations, or across multiple centuries, remain limited. Importantly, climatic and demographic factors have both been shown to influence the frequency and severity of human conflict. The interaction between climate and demography has the potential to further amplify these dynamics, as climate change may structure population growth and carrying capacity and both climate and population influence per capita resource availability. We compare paleoclimatic and demographic data with osteological evidence for lethal trauma from 354 directly radiocarbon-dated individuals from the Nasca Highlands and the Maya lowlands. Summed probability distributions of radiocarbon dates provide relative population estimates for each region and relationships between climate, population, and conflict are examined with Generalized Linear Models (GLMs). In the Maya case we find a direct causal relationship between drought and conflict without the mediating influence of population change. In the Nasca Highlands we find that favorable climate conditions promoted rapid population growth, resource strain, and resulting violent competition. Our work highlights the complex relationships between climate and demography resulting in conflict.

Geraci, Pete [126] see McLeester, Madeleine

**Gerard-Little, Peregrine (Argonne National Laboratory), Dana MacDonald (University of Massachusetts, Amherst), Daniels O'Rourke (Argonne National Laboratory) and Conner Wiktorowicz (Argonne National Laboratory)****[24]***Environmental Reconstruction and Rural Landscapes: A Multidisciplinary Approach to Exploring a Historic New Hampshire Farming Community*

In the 1940s, the US government acquired property in Hillsborough County, New Hampshire, for an aerial gunnery complex, preserving a range of cultural resources from wider development. These cultural resources are central to reconstructing local, rural agricultural life and community in New Hampshire during the 1700s–1900s at the landscape scale. This multi-method study combines documentary sources and archaeological data, including palynological analysis of a local peat core, to track local landscape development and human activity over time. The palynological sedimentary archive speaks to the rich biodiversity of the pre-settlement transition hardwood forest. Local forests did not significantly change due to Euroamerican settlement until after the onset of significant forest harvesting ca. 1800—overstory taxa reached their low point in ca. 1870. A steady increase in disturbance taxa indicate a subsequent land conversion to pasturing and farming until 1880–1910 CE, correlating with a peak number of historic sites. This study demonstrates the capacity for unified archaeological methods to accurately reconstruct the dynamic histories of local landscapes and communities. It also demonstrates the importance of cultural resources management at air force installations to archaeological research and the preservation of cultural heritage.

Gerard-Little, Peregrine [24] see Wescott, Konnie

Germick, Stephen [215] see Cray, Joseph

**Geurds, Alexander (University of Oxford)****[154]***Chair*

Geurds, Alexander [125] see Gill, Lucy

Geurds, Alexander [154] see Kolbenstetter, Marie

**Ghaheer, Fatemeh****[183]***Neo-Assyrian Empire: Imperial Power's Effect on Agricultural and Pastoral Strategies of Farmers in Semiarid Environments through Phytolith Investigation*

The Neo-Assyrian Empire ruled from the eastern Mediterranean Sea to western parts of Iran and to the Persian Gulf during the first millennium BC with their main centers located in Mesopotamia with a well-organized agricultural system. In this paper, I will employ political ecology and phytolith analyses to examine the impact of the Neo-Assyrian Empire on agriculture and land-use in Iraqi Kurdistan, at ongoing excavations of Assyrian period sites in the Peshdar Plain Project, directed by Professor Karen Radner, University of Munich. In this study, I explore how farmers' agricultural activities were affected by the empire and transformed to marginal lands neglected by the power. Marginalization of the populations' activities was one of the political strategies of the Neo-Assyrian and many empires to control the populations and their actions. Marginalization was not only limited to lands but also to the type of substance products for humans and animals' consumption. I also suggest that empire's political strategies shifted crop processing and storing activities to more central locations controlled by the power which limited the inhabitants' access to food accumulations. These allowed the empire to have more control over the movements and activities of the residents.

**Ghezzi, Ivan (Pontificia Universidad Católica del Perú)****[103]***High-Precision Dating of the Chankillo Solar Observatory: Wiggle-Matching and Modeling Dendroarchaeological Radiocarbon Dates*

Chankillo is a large ceremonial center located on the north coast of Peru, built and dedicated to a solar cult at the end of the Early Horizon. It contains an astronomical observatory, unique in its kind, worldwide, for covering the entire range of solar positions throughout the year. It has installations allowing impressive solar alignments to be observed by the public, as well as installations for the elites, which used alignments and light and shadow casting devices to mark dates. To investigate all possible astronomical functions at Chankillo, we developed a chronology of its construction, occupation, and destruction. Radiocarbon dates of short-lived materials obtained through excavations were combined with radiocarbon dates obtained from the rings that mark the cutting dates in wood from algarrobo trees, firmly associated with the architecture and stages of construction of the site. Wiggle-matching and modeling of these radiocarbon dates in Oxcal allowed us to achieve high precision results. The new Chankillo chronology allows us to deepen our archaeoastronomical investigations, as well as to reveal many details of the human occupation of this important ceremonial center.

**Ghezzi, Ivan (Pontificia Universidad Católica del Perú)****[192]***Chair*

Ghezzi, Ivan [192] see Lau, George

Gibaja, Juan [98] see Marreiros, Joao

**Gibson, Wesley****[5]***Maximum Entropy on the Colorado Plateau*

In this paper, I present and discuss two predictive models for open-air Basketmaker II settlement patterning in two regions on the Colorado Plateau. Predictive models are primarily used in cultural resource management but can also be used in research into past settlement behavior. The methods to create predictive models vary considerably between regions and are rarely compared between regions to determine their effectiveness. To determine if predictive models are an effective tool in two areas on the Colorado Plateau, I use a machine learning modeling approach known as Maximum Entropy analysis to create open-air Basketmaker II settlement models for Black Mesa in Arizona and the Grand Staircase-Escalante National Monument in Utah. These two areas were chosen because they contain classic Basketmaker II sites but vary in regard to climate, topography, the amount of land subjected to intensive pedestrian survey, and the number of sites recorded. By conducting the same analysis in two regions, the efficacy of this particular modeling technique can be tested. I present both models and discuss which environmental factors are most useful for predicting the presence of open-air Basketmaker II sites as well as the minimum requirements for creating useful predictive models on the Colorado Plateau.

**Gibson, Wesley****[5]***Chair*

**Gierek, Lynn, Morgan Blanchard and Margan Grover****[24]***New Dena'ina Settlement Identified on Joint Base Elmendorf–Richardson, Alaska*

2020–2021 Section 110 research conducted by Northern Land Use Research Alaska, LLC, in cooperation with the Joint Base Elmendorf–Richardson (JBER) cultural resources management, evaluated 14 Alaska Heritage Resource Survey (AHRS) sites and for National Register listing and identified a small Dena'ina settlement at JBER in Anchorage, Alaska. The settlement consists of three late Dena'ina house pits and associated cache pits located on the north side of the Eagle River Flats in an active impact zone. <sup>14</sup>C dating of charcoal from a hearth in one of the house pits yielded a conventional radiocarbon age of 1720–1780. Testing in a second house pit yielded interesting finds including skeletal faunal remains: foot bones from an individual lynx and postcranial fragments from at least two pine martens. The three house pits are the only confirmed house pits at JBER. The house pits have the potential to guide a variety of research questions from seasonality and social stratification to economic exchange through the upper Cook Inlet with European communities. The site provides new information on late Dena'ina settlement on the east side of the upper Cook Inlet and demonstrates the Dena'ina's long cultural connection to lands within the boundaries of JBER.

**Gifford-Gonzalez, Diane (University of California, Santa Cruz)****[16]***Of Mice and Humans*

I have known Mary Stiner since she was a new grad student in the UNM graduate program, when she and my former undergraduate student Steve Kuhn were forming their personal and intellectual partnership. I was struck by her artistic gifts, as well as her intelligence and humor, all of which served her well in navigating a department then filled with very big personalities. I was the “outside member,” and the only zooarchaeologist, on Mary's dissertation committee. As I read Mary's research on Neanderthal and modern human uses of animals, I got the same inkling that I'd had when reading Steve's midterms and finals at UC Santa Cruz: why the hell am I teaching someone so much smarter than I am? Mary richly deserves the Fryxell Award, for her work on the dynamics of human-animal interactions over evolutionary time, and the many insights she—and Steve—have published, on using evolutionary ecology to tease out this narrative. Because her work has focused on smaller species as well as larger ones, I offer a view of how, on a much shorter time scale, analysis of archaeofaunal rodents contributes to assessing Native use of fire in landscape management in central California.

**Gifford-Gonzalez, Diane (University of California, Santa Cruz)****[41]***Constructing Community with Trash*

For over 30 years, Judith Habicht-Mauche and I shared a department, intradepartmental struggles, overload teaching in a nascent graduate program, and for much of it, a common door between our labs, through which shared graduate students and errant postdocs came and went. During this time, I came to be inspired by Judith's work on the potters and societies of the North American Southwest. Her drive to recruit conceptual frameworks that enabled her command of high-tech analytic methods to pay off, in terms of telling well-supported stories about people, seeped into my own zooarchaeological thinking. This poster presentation is an outcome of one such line of thinking that she and her research inspired in me, thinking about individuals and communities in the ancient East African landscape.

**Gifford-Gonzalez, Diane (University of California, Santa Cruz)****[6]***Discussant***Gijanto, Liza (St. Mary's College of Maryland)****[80]***Abolition and Its Aftermath on the Gambia River*

The abolition of the Atlantic Slave was marked by the founding of the British colony of Banjul on the Gambia River in 1816. A planned urban center, the city developed around a series of neighborhoods designated as colonial, merchant, and African laborer spaces. Among the most prominent settlers were the Liberated Africans from Sierra Leone and French traders from Goree who were instrumental in the growth of the colonial economy. This established two new colonial identities that must navigate British colonial socioeconomic rules to establish themselves in direct opposition to the indigenous communities, particularly the liberated Africans who began their time in the colony as indentured. This paper explores the tactics each group used to express their “non-other” identities via material means drawing on the archaeological and historical record.

**Gil, Adolfo (CONICET-IANIGLA Grupo Vinculado San Rafael), Jacob Freeman (Utah State University), Eva Peralta (Instituto de Evolución, Ecología Histórica y Ambiente), Manuel López (IADIZA-CONICET and UNCuyo) and Gustavo Neme (Instituto de Evolución, Ecología Histórica y Ambiente)****[47]***Looking in the Border: Variation in Central Western Argentina Human Population Dynamics and the Spread of Maize Farming*

We test the hypothesis that when foragers adopt domesticated plants, the result is a large, long-term spike in population growth followed by an abrupt decline. We expect more pronounced population declines in regions more suitable for agriculture than those with less suitability for agriculture due to specialization on domesticates at the expense of hunting and gathering activities. Central western Argentina's environmental variation makes the region a useful location to test this hypothesis. We propose that the magnitude of boom-bust periods varies with local socioecological conditions, in particular, the suitability of areas for the production of domesticates. We evaluate it using RC-SPD and human bone stable isotope results from archaeological remains covering the last 3000 years cal BP.

**Gill, Lucy (University of California, Berkeley), Irene Torreggiani (University of Oxford) and Alexander Geurds (University of Oxford)**

[125]

*Cuisine and Ceremony: Coupling Ecological and Archaeological Perspectives in the Mayales River Valley (Chontales, Nicaragua)*

The Mayales River Valley (Chontales, central Nicaragua) is known for its monumental anthropomorphic sculptures, large mounded sites, and zoomorphic petroglyphs. These archaeological traces are the material manifestations of human-environment relationships, but they cannot be fully understood without paleoenvironmental context, which remains understudied in this region. This is particularly concerning given the extreme erosion, droughts, and inundations that have plagued Chontales for the past decade, caused by the intersection of drastic hydroclimatic and land use changes. We present results of the first integrated zooarchaeological and archaeobotanical analyses from this region, focusing on the site of Roberto Amador (~1000 BP) and incorporating selected results from other sites of the valley for comparison. We interpret these results from: (1) an ecological perspective: constructing environmental baselines prior to the implementation of large-scale cattle ranching; and (2) an archaeological perspective: studying strategies for resources procurement, land use, cuisine and taste, and funerary practices. We introduce new evidence of animal domestication alongside a primary reliance on diverse wild animals from freshwater streams, lakes, tropical dry forest, and rain forest. We specifically compare mortuary and non-mortuary contexts, to elucidate the variability of interactions between humans and the Mayales River Valley's flora and fauna.

Gill, Lucy [125] see Donner, Natalia

**Gill, Rachel (University of Illinois, Urbana-Champaign) and Lisa Lucero (University of Illinois, Urbana-Champaign)**

[22]

*Zooarchaeological Analysis of Biodiversity and Health of the Ancestral Maya Forests of Central Belize*

The ancestral Maya have had a long and successful habitation of the semitropical rainforests of Central America, despite the challenges this kind of humid environment presents. Archaeological evidence indicates the near-continual occupation of many sites in the Maya lowlands for several centuries, even through periods of political and social transition. Using previously unanalyzed zooarchaeological remains excavated from Saturday Creek (300 BCE–1500 CE) in central Belize, I demonstrate that the presence of umbrella species in the archaeological record indicates a biodiverse and relatively healthy forest surrounding the site. Umbrella species are those identified in conservation biology as those that have many species within rare or unpredictable habitats that overlap with them. Previous assumptions about the Terminal Classic period (800–900 CE) indicate a severe and aggressive overuse of resources including land clearing for agriculture. However, the presence of umbrella species in the archaeological record suggests the ancestral Maya were not aggressively overusing forest resources available to them at this critical period of political and social transition, but rather worked with the forest or managed local resources for over a millennium.

Gilley, Brian [159] see Sievert, April

Gilligan, Meredith [215] see Stewart, Caitlin

Gillreath-Brown, Andrew [47] see Bird, Darcy

**Gilman, Patricia (University of Oklahoma) and Thatcher Rogers (University of New Mexico)**

[86]

*Mimbres Connections into the Southern Mogollon Region: The West Baker Shrine Site at the Far Edge of Things Mimbres*

The West Baker site is a 26-room Mimbres pueblo on the southeastern slope of the Pyramid Mountains—at the far edge of things Mimbres. It contained an important shrine, a large pit encircled by rock and filled with thousands of pieces of shell, turquoise, and other artifacts. To our knowledge, this shrine has no direct parallel at other Mimbres sites. We argue that West Baker was a habitation site and not a temporarily used farmstead. We also contend that people at this site had social relationships with those in the Mimbres Valley heartland located about 100 km away, and the shrine must have been important to people in both areas. We discuss the data supporting our contentions as well as the possible reasons for and meanings of the shrine by contextualizing them within the transborder area during the Mimbres Classic period.

Gilman, Patricia [118] see Nelson, Margaret

Gilman, Patricia [14] see Plog, Stephen

**Gilmore, Kevin (HDR)**

[22]

*"When the Well Is Dry, We Know the Worth of Water": Drought, Temporal Climate Variability, and Prehistoric Population Dynamics on the Western Margin of the Great Plains*

Archaeologists often cite drought as a major disrupter of prehistoric human societies and driver of culture change. However, the response of human societies to drought is complex and context-dependent. Population size, density, and how close it is to carrying capacity define that context. Severe drought and temporal climate variability both have a negative impact on net primary productivity and therefore the quantity and predictability of critical resources, and in conjunction these effects are amplified synergistically. The computation of the Volatility Index from the reconstructed annual PDSI (Cook et al. 2010) allows examination of the interaction of drought and climate variability on prehistoric people. In eastern Colorado, the Early Ceramic Drought (AD 250–550) is characterized

by extended severe but stable drought. A small, dispersed (but increasing) population significantly below carrying capacity adopted technological innovations in response to drought that increased resource procurement and processing efficiency, allowing population growth during periods of reduced environmental productivity. Conversely, during the Medieval Climate Anomaly (AD 950–1450), a large, rapidly expanding, denser population closer to momentary carrying capacity responded differently to climate change. After the rapid onset of severe drought and variability AD 1145–1158, population size and density decreased significantly and groups were smaller, dispersed, and more mobile.

Gilmore, Zack [114] see Minette, Elizabeth

**Gilstrap, William (Massachusetts Institute of Technology)**

[226]

*Pottery Technology and Cultural Transfer along Anatolia's Great Caravan Route*

Excavations of Early Bronze III phases (ca. 2350–2250 BCE) site of Kanligecit in Eastern Thrace revealed material remains reminiscent of contemporary and slightly earlier sites in western and central Anatolia. The presence of monumental architecture similar to Troy II coincides with the first appearance of wheel-made pottery—Anatolian Red-Slipped tankards and depas cups—suggest strong eastern influence. These pottery forms were followed by wheel-made plainwares and shapes such as high-necked jars that first arrived in Cilicia from the south before being transferred along trade routes to central Anatolian sites like Kulluoba. Strong Anatolian traits, particularly wheel-made pottery, indicate to some that EB III Kanligecit was an Anatolian colony. Others contend it is a product of cultural and technological diffusion assisted through expansion of existing trade routes from Syro-Cilicia across central Anatolia. This phenomenon similar to that observed in the EB II Aegean in which Anatolian architectural features and drinking sets (e.g., Lefkandi-Kastri group) become widespread. This paper examines production technology of both Red-slipped and plainware from contemporary phases at Kanligecit and Kulluoba to provide insight into the degree that Kanligecit potters adopted the use of the wheel and to provide new insight into the nature of this cultural shift.

**Gingerich, Joseph A. M. (Ohio University), Timothy Cleland (Smithsonian Institution), Gwenaelle Kavich (Smithsonian Institution) and William Childress (Archaeological Society of Virginia)**

[117]

*Is That Really Late Pleistocene Blood? A Case Study from the Clovis Assemblages at Smith Mountain, VA*

Many recent studies have been published that report the recovery of proteins and residues on stone tools. This avenue of research could provide important insights about hunter-gatherer activities. The most common type of analysis has been detection blood residue. Because many immunological approaches to detect blood residue have been called into question, we suggest a multifaceted approach to protein residue studies. Here, we present a case study on a late Pleistocene artifact from Smith Mountain, Virginia, USA. This study discusses the results of immunological analyses, FTIR, mass spectrometry, and SEM analyses on a ca. 13,000-year-old Clovis point from eastern North America.

Ginsburg, Sarah [39] see Russ, Jon

**Giovas, Christina (Simon Fraser University), Scott Fitzpatrick (University of Oregon) and Sandrine Grouard (Muséum national d'Histoire naturelle)**

[85]

*Advancing Chronology Building for Introduced Agouti (*Dasyprocta* sp.) in the Precolumbian Lesser Antilles, Caribbean*

Between 2500 and 500 BP Indigenous peoples introduced numerous animals to the Caribbean from the continental Americas. Among these was the agouti (*Dasyprocta* sp.), a medium-sized, Neotropical rodent. Although the agouti is the most widespread and ubiquitous of precolumbian introduced animals, attention to the cultural dynamics and chronology of its introduction has been limited. Notably, only one specimen has been directly radiocarbon dated despite the same having been done for many other prehistorically introduced animals, which has altered the accepted timing of arrival and their endemic status. Accordingly, the agouti's low-resolution chronology significantly hampers understanding of the sociocultural conditions of introduction and interaction with humans. Here, we report seven new AMS dates from five sites on four islands: Antigua, Nevis, Marie Galante, and Carriacou. These dates represent the first critical, systematic effort to develop a chronology for this species in the Lesser Antilles. We discuss the archaeological significance of these results and recommendations for future chronology building, including the application of chronometric hygiene protocols.

**Giraldo Tenorio, Hernando (Universidad del Cauca), Mateo Díaz (Independent Researcher) and Germán Corrales (Universidad del Cauca)**

[167]

*Actividades domésticas y producción artesanal prehispánicas en el valle de Popayán, Colombia*

El control de la producción de bienes de alto poder simbólico o utilitario ha sido tradicionalmente hipotetizado como parte de las estrategias de liderazgo para los diferentes cacicazgos del suroccidente colombiano (2500–500 aP). No obstante, para el valle de Popayán, los documentos históricos del siglo XVI no mencionan la participación de las elites políticas nativas en la producción especializada de bienes, y no hay investigaciones arqueológicas previas dirigidas a describir las actividades económicas de los pobladores prehispánicos. Recientes investigaciones arqueológicas de contextos residenciales proporcionaron información de las actividades de consumo y producción de las viviendas de alto estatus en la región. Contrario a lo esperado, la información de los contextos domésticos sugiere que las elites locales no participaron en la producción artesanal especializada, sino que produjeron lo necesario para su propio consumo.

**Gjyshja, Zhaneta****[147]***Lluga: Preliminary Data from a Late Neolithic Site in Western Kosova*

This paper presents the preliminary results of survey work conducted at the multi-period village site of Lluga, located in the Dukagjin region of western Kosova. The site is approximately 3 ha, situated on a plateau, bounded by a creek to the north, with a nearby freshwater spring, which local people still use. Preliminary analysis of numerous artifacts, recovered during a 5 × 5 m gridded surface collection, including stone tools, ceramics, and at least eight taxa of animal bones, suggests that the site was occupied at least since the Late Neolithic and continued in use into the Bronze Age and down to medieval times. The high density of chert tools, including cores, primary and secondary flakes, blades, and awls, indicates that it was a lithic workshop. Many other artifacts, including ground tools of various raw materials, shapes, and sizes, burned daub, ceramic wasters, a spindle whorl fragment, and a Vinča figurine head, present evidence for complex and dynamic human activity at the site. Lastly, magnetic gradiometry results indicate possible longhouses, multiple anthropogenic features, and a potential enclosure. These data point to the multifaceted nature of Lluga in western Kosova.

**Gjyshja, Zhaneta****[147]***Chair***Glascocock, Michael (University of Missouri) and Rodrigo Loyola (University Paris Nanterre)****[192]***Once Upon a Time: Obsidian Circulation during the Early Peopling of the Atacama Desert*

Early humans to South America encountered wide diversity of ecosystems, including the Atacama Desert. Due to its extreme aridity, the Atacama Desert is generally considered a marginal cultural area inhabited by a handful of scattered hunter-gatherer groups. Very little is known about the level of contact between groups living in the Atacama and the neighboring area of northwest Argentina. To investigate the extent of interaction networks of hunter-gatherer groups in the region an obsidian artifact investigation was conducted. Several hundred artifacts from archaeological sites occupied during the Early Archaic (13,000–11,000 BP), Middle Archaic (11,000–5500 BP), Late Archaic (5500–4500 BP), and Early Formative (3500–2500 BP) were analyzed by X-ray fluorescence (XRF), and a subset of undetermined artifacts were studied by neutron activation analysis (NAA). A combination of local and long-distance sources was identified, as well as several currently unknown sources. Temporal differences in source usage indicate that interaction networks expanded over time. The evidence supports that hunter-gather groups maintained long-distance contacts with one another as a key strategy for survival in one of the most extreme environments on earth.

Glascocock, Michael [150] see de la Fuente, Guillermo

Glascocock, Michael [167] see Navas-Méndez, Ana

Glascocock, Michael [67] see Wallis, Neill

Gliganic, Luke [10] see Meyer, Michael

**Glover, Jeffrey (Georgia State University) and Dominique Rissolo (University of California, San Diego)****[128]***Tales of an Iconographer in an Iconography-Poor Zone: Karl Taube and His Legacy in the Yalahau Region*

Taube first became acquainted with the Yalahau Region in the 1980s while living and studying Yucatec Mayan in the small community of San Juan de Dios. As a young epigrapher, iconographer, and archaeologist, the region looked promising. Megalithic architecture connecting Naranjal culturally to the major Formative site of Izamal and Postclassic murals executed in the East Coast style at San Angel seemed like a promising start for the archaeology of the region; however, as we all know, carved monuments and detailed iconographic data are not what the Yalahau region had to offer. After Taube and Fedick started the Yalahau Regional Human Ecology Project in 1993, Taube continued to expand the scope of his research beyond northern Quintana Roo, becoming the pan-Mesoamericanist we are celebrating today. In this paper we would like to reflect on the influence that Taube had on the archaeology in the Yalahau region and more importantly on us as scholars. Whether it be interpreting cave art or inspiring us to think more broadly about the connection between ancient Maya beliefs and the material record, Taube's influence in the Yalahau region lives on through the work that we continue to this day.

Glover, Jeffrey [67] see Goff, Lindsey

Glover, Jeffrey [177] see Przybyla, Joy

Glover, Jeffrey [154] see Rissolo, Dominique

**Glowacki, Donna (University of Notre Dame), Gonzalo Huidobro Marin (University of Notre Dame), Sean Field (University of Notre Dame) and Alan Hamlet (University of Notre Dame)****[173]***Ancestral Pueblo Water Management: Reinvestigating the Purpose and Function of Far View Reservoir*

Over the last century, archaeologists and paleohydrologists have debated the purpose and function of a large, circular, masonry-lined structure known as the Far View Reservoir on the Mesa Verde cuesta. The controversy centers on whether it was a ceremonial feature or for water storage. Additionally, those who believe it was used for water storage have put forward different explanations of how the system actually worked. Building on previous studies, an interdisciplinary team of archaeologists and hydrologists assessed these hypotheses using a combination of (1) evidence from previous Far View excavations, (2) hydrologic modeling to identify feasible locations of potential ditches, and (3) new field studies to confirm or refute hypothesized ditch locations.

Preliminary investigation showed that local water supply infrastructure would have been required to provide water for the Far View community, and the nearest alternate water source is at least 2 km away. Hydrologic modeling using a 5% slope for ditches showed that the system would likely have used one main feeder ditch on the mesa top with two side ditches in the upper watershed. Our field studies confirmed this basic configuration, and found fewer ditches than some earlier studies had hypothesized.

Glowacki, Donna [152] see Field, Sean  
Glowacki, Donna [208] see Portman, Katherine

Gneisinger, Walter [191] see Paixao, Eduardo

**Godbout, Genevieve (CELAT—Université Laval)**  
**[80]**

*A Freedom to Labor in Nineteenth-Century Canada*

This paper centers on the material record left behind by working-class African Canadian and African American migrants in the heart of Toronto in the latter half of the nineteenth century. The residents of this neighborhood participated in a transnational movement toward freedom-seeking, in a context when racialized economies followed different yet entwined trajectories in Canada and the United States. While most narratives about Black Canadian history of this period tend to foreground the liminal transformation between servitude and nominal freedom afforded by the Underground Railroad, the archaeological record presents us with the opportunity of foreground the lived experience of urban labor, including that carried out by women in their residence. This paper draws from archaeological material collected from privy and backyard contexts closely associated the Simpson family, who migrated from the United States to Toronto as free people around the 1830s. This material is used to interrogate the politics of skilled labor in a context where discourse on race, nationalism, gender, and poverty worked to entrench social distinction in a fast-growing industrial city.

Godfrey, Laurie [120] see Hixon, Sean

**Godhardt, Ava (University of Montana), Lauri Thompson (Center for Archaeological and Tropical Studies), Julie Saul (Programme for Belize Archaeological Project) and David Hyde (Western Colorado University)**  
**[91]**

*Contemporaneous or Close at Death? Two Late Classic Burials from the Medicinal Trail Community, Northwestern Belize*

Excavation of Group A at the Medicinal Trail Hinterland Community archaeological site in northwestern Belize, near the major polity of La Milpa, uncovered the remains of two individuals in cobble fill, interred semi-flexed. The upper individual was placed head to the east and feet to the west, while the lower individual was placed head to the west and feet to the east. Though there was, in some areas, fill located between the individuals, suggesting they may have been interred at different times, both show a high degree of skeletal articulation. Articulated vertebral columns, as well as pelvis and lower limb bones suggest contemporaneity of the burials, or at least very little time between interments. Though fragmentary, the burials, designated A-8-a and A-8-b, consist of well-preserved and diagnostic skeletal remains including cranial elements as well as postcranial components. The level of preservation of the two individuals is remarkably better than previous burials at this site. This poster discusses the excavation process used, the osteobiography of each individual, their significance with regards to Maya mortuary practices, and the possible causes for the well-preserved remains. Additionally, an assessment of the timing of the interment of the two individuals will be provided.

Goebel, Ted [105] see Graf, Kelly  
Goebel, Ted [113] see White, John

Goemaere, Eric [155] see Chanteraud, Claire

**Goff, Lindsey (Georgia State University) and Jeffrey Glover (Georgia State University)**  
**[67]**

*Navigating the Built Environment of Ancient Maya Coastal Ports along the Yucatán Peninsula*

Archaeological research along the littoral of Mexico's Yucatán Peninsula has led to the discovery of hundreds of precontact coastal settlements. Following the work of Andrews (1990), these ancient Maya coastal sites had multiple functions ranging for simple fishing villages to international port sites that facilitated long-distance, canoe-based trade. It is the latter category that we focus on in this poster. The built environment of these port sites and the geomorphological characteristics of their surrounding coastline played a critical role in the services they provided for traders. While individual site-level analyses exist, we take a broader comparative approach to highlight the similarities and differences in how these sites were constructed, and in turn experienced by the people who inhabited them and who visited them.

**Göhring, Andrea (LMU Munich), Martin Gruber (LMU Munich) and Kai Kaniuth (LMU Munich)****[157]***The Complementary Work of Archaeology, Human Morphology, and Multi-isotope Analyses: Identifying Nonlocals within Archaeological Skeletal Remains from Karacamirli, Tepe 5 (Azerbaijan)*

Excavations at Tepe 5 (Karacamirli, Azerbaijan) revealed a cemetery with radiocarbon-dated burials of the Late Bronze/Early Iron Ages (LBA/EIA) and of two narrow timeframes in Late Antiquity (mid-third to late fourth century, during the Sasanian domination) and in the Medieval period (fourteenth century, during the Mongol occupation). Archaeological, morphological, and multi-isotope analyses were conducted to shed light on the local population of the Kura river basin and trace potential migratory patterns and other effects due to changing historical settings. Gaussian Mixture Model clustering allowed defining groups using craniometric indices. According to these indices, some individuals were indicated as possible nonlocals. This was further validated using multi-isotope fingerprints. The potential regions of origin differed between individuals dating into LBA/EIA and Medieval times. The isotopic data also revealed a different diet for Late Antique individuals compared to the remaining individuals, indicating a different cultural origin. Moreover, from a morphological point of view some medieval individuals showed signs of nutritional deficiencies, indicating a worsening of the living conditions after the Mongol invasion. Based on this multidisciplinary approach it was possible to identify primary nonlocals, including the definition of potential regions of origin, and individuals with a different cultural background. (images of human remains)

Gokee, Cameron [186] see Rosenstein, Dana Drake

**Goldberg, Paul (University of Tübingen) and Takis Karkanas (Malcolm H. Wiener Laboratory for Archaeological Science)****[16]***Seeing Stratigraphy*

Stratigraphy is the lowest common denominator of any archaeological site and provides the ultimate context for anything that is found there. And yet, besides a basic course in archaeology and perhaps geoarchaeology, most excavators are not trained to see site stratigraphy and stratigraphic details, which include both geogenic and anthropogenic processes and factors. Misplaced emphases on color, for example, or on incorrect and incomplete understanding about how sediments accumulate and how they relate to the archaeological materials (e.g., fauna, ceramics, lithics, architecture) are common. Such misunderstandings can lead to not only poor or incorrect documentation and interpretation of the site but also a dismissal of crucial aspects of site history recorded in the deposits. To help remedy this situation, we have been teaching a weeklong field school on site formation, stratigraphy, and geoarchaeology, first in Corinth and now in the Athenian Agora. Student involvement focuses primarily on archaeological context, geoarchaeology, and material sciences, and emphasizes field observations, on-site laboratory analysis, the recording of stratigraphy, and the understanding site formation processes. Feedback from past participants indicates that they learned to see things that they had never paid attention to previously and thus we feel that we have surpassed our goal.

Goldberg, Paul [108] see Forste, Kathleen

Goldberg, Paul [60] see McPherron, Shannon

Goldberg, Paul [108] see Smith, Alexander

**Golden, Charles (Brandeis University)****[13]***Negotiated Authority, Public Goods, and Classic period Maya Statecraft*

Modern scholarship gives us ever more nuanced, subtle visions of Maya sovereigns and of a broader populace whose lives are brought into focus by regional surveys and household archaeology. But our views of Classic Maya statecraft remain reliant on texts, imagery, and material culture that were meant to glorify dynastic rulers and their allies. Such data inevitably skew us toward representations of the exercise of power from above. How, then, can our sources help us to model the ways in which Maya statecraft was built around broader participation and consent (if not consensus), multi-party negotiations, collective action, and trust? What public goods did the Classic Maya state provide, and can our data point us to a model of civil society, its functions, and its discontents? In this paper, I explore the processes, goals, and risks of statecraft for royal courts and rural hamlets that led to centuries of expansion and subsequent retrenchment and restructuring of the institutions and practices of Maya rulership in the first millennium AD.

Golden, Charles [153] see Scherer, Andrew

Göldner, Dominik [187] see Falcucci, Armando

**Goldstein, Lynne****[45]***Discussant*

**Goldstein, Paul (UC San Diego), Nicola Sharratt (Georgia State University), Bruce Owen (Sonoma State University) and Sarah Baitzel (Washington University)****[87]***Comparing Household and Settlement of the Moquegua Province and John Janusek's Tiwanaku*

John Janusek's contribution to the archaeology of native American urbanism and social identity is well-known. Research on five centuries of Tiwanaku expansion, colonization, migration, and ethnogenesis in the Tiwanaku provinces of Moquegua, Peru, has been informed by Janusek's analysis of the Tiwanaku capital, including his vast store of published and unpublished comparata on every aspect of Tiwanaku life. Rare is the field or lab season when we do not wonder: "Did John find any of those?" about some feature or artifact. More importantly, our understanding of the expansion and collapse of Tiwanaku civilization has evolved in constant conversation with John Janusek's vision of identity, pluralism, and polity in the Tiwanaku homeland. Here, we describe recent research on state-contemporary (AD 700–1000) and post-expansive (AD 900–1200) Tiwanaku Moquegua, and some of our alignments, convergences, and divergences with Janusek's interpretations. Contrasts and similarities in settlement pattern and household and mortuary practices between the Tiwanaku core and the Ilo, Moquegua, and Tumilaca sections of the Osmore valley, encourage insights into understanding organization and change in expansive complex societies.

**Goldstein, Paul (UC San Diego)****[217]***Discussant*

Goldstein, Paul [85] see Rubinatto Serrano, Juliana

**Goldstein, Steven (Max Planck Institute for the Science of Human History), Natalie Mueller (Washington University in St. Louis), Anneke Janzen (University of Tennessee, Knoxville), Emmanuel Ndiema (National Museums of Kenya) and Nicole Boivin (Max Planck Institute for the Science of Human History)****[186]***Evidence for Early Domesticated Cattle and Finger Millet (Eleusine coracana) at Kakapel Rockshelter, Western Kenya*

Finger millet (*Eleusine coracana*) is a tetraploid grain crop that was grown along with sorghum (*Sorghum bicolor*) and pearl millet (*Pennisetum glaucum*) by farming societies across sub-Saharan Africa prior to European colonialism. Finger millet continues to be a critical arid-tolerant crop for small-holder farmers across much of Africa and southern Asia today. Despite its importance in the past and present, it remains the only major grain for which the exact region, time period, and processes of domestication remain unresolved. Few grains of *E. coracana* have been recovered from archaeological contexts in Africa dated to 2000 years BP. Here we report the archaeological contexts and periods documented at Kakapel Rockshelter in western Kenya and present early evidence for both cultivation and arrival of domesticated animals. Significant quantities of finger millet were recovered in Early Iron Age and Kansyore forager contexts, presenting the earliest secure examples of the crop, and plant agriculture, in eastern Africa. Zooarchaeological and ZooMS analyses also identified the earliest cattle in western Kenya, preceding the arrival of herders to the region. These findings provide new insights into the mechanisms involved in the spread of diverse forms of food production in eastern Africa.

**Goldstein, Steven (Max Planck Institute for the Science of Human History)****[6]***Moderator*

Goldstein, Steven [186] see Mueller, Natalie

Golitsko, Mark [160] see Grogan, David

Gollihue, Elaine [173] see Mink, Philip

Goman, Michelle [154] see Hedgepeth Balkin, Jessica

Gomes, Ana [186] see Skosey-LaLonde, Elena

**Gómez Barrillas, Oswaldo (IDAEH)****[53]***La Plaza de los Siete Templos o Plan de Plaza 7 de Tikal: Nuevas Interpretaciones*

Marshall J. Becker es un investigador visionario y su legado debe de continuarse. Entre sus principales aportes está el haber comprendido la importancia que la organización espacial de las ciudades Mayas ayuda a comprender su desarrollo religioso, social y político. Muchos han seguido y ampliado sus importantes postulados. Las investigaciones en la Plaza de los Siete Templos de Tikal revelaron que este conjunto arquitectónico no es el producto de un solo momento y de una sola idea constructiva, sino que se trata de la adaptación ingeniosa de los sacerdotes, arquitectos e ingenieros que asesoraban a los gobernantes de la ciudad. Veremos como un espacio constitutivo del Grupo Tipo E, se transformó en una plaza dedicada al juego de la pelota, que luego fue utilizada para la exaltación del gobernante de turno, para finalmente convertirse en un espacio de viviendas improvisadas para personas que no pudieron abandonar la ciudad.

Gómez Barrillas, Oswaldo [53] see McNeil, Cameron

Gómez-Pujol, Lluís [108] see Llobera, Marcos

**Gonçalves, Célia (ICArEHB, Universidade do Algarve), Daniela Maio (ICArEHB, Universidade do Algarve), João Cascalheira (ICArEHB, Universidade do Algarve) and Nuno Bicho (ICArEHB, Universidade do Algarve)**  
[98]

*Intrasite Spatial Analysis at the Upper Paleolithic Site of Vale Boi, Southern Portugal*

The usefulness of spatial analyses across an archaeological site has been solidly demonstrated by several studies over the last decades. The main advantages of these approaches are in providing an alternative perspective for understanding site function, the occupational organization of human living and associated activities, identifying clusters and data anomalies, defining potential activity areas, shifts in space occupancy over time, and helping in the identification of site formation processes. Due to the high-resolution methods used for data acquisition over the last two decades, the Paleolithic site of Vale Boi, in Southwestern Iberia, is an optimal resource for the application of spatial analysis techniques. Vale Boi is a multicomponent site with a fairly complete Upper Paleolithic record, spread over several open-air loci and a rockshelter area. This presentation focuses on the use of geospatial analysis tools, such as the Kernel Density Estimation, Average Nearest Neighbor statistics, and artifact orientation patterns for the characterization of the distinct archaeological horizons in Vale Boi's rockshelter and terrace and their relevance for understanding human occupation patterns at the site.

Gonciar, Andre [71] see Bethard, Jonathan

Gonciar, Andre [71] see Zejdlik, Katie

**Gonzales, Mikayla (University of New Mexico), Caroline Watson (William & Mary), Emily Hull (William & Mary), Emmanuel Macias (University of New Mexico) and Amy Thompson (University of Texas at Austin)**  
[159]

*Why Should Students Present Posters at the SAA Annual Meetings?*

The first poster presentations at the SAAs were in 1996, with a session consisting of six presentations. Now, posters comprise a key component of the SAAs with more than 500 posters presented at the annual meetings. Of those, more than half are led by students. Poster presentations provide an ideal venue for students to get their foot in the academic door as a place to get feedback on their research, network with a variety of scholars and professional archaeologists, and gain crucial skills in public presentations. It is important that posters be well-designed and engaging. We highlight key elements for poster presentations including simple language, compelling images, and clear research design and findings. After the SAAs, posters can be shared with stakeholder communities, creating transparency and conveying information of archaeological research to the greater public. Here, we include testimonials on the value of poster presentations from archaeologists of varying experiences, including undergraduate students, graduate students, professors, and CRM professionals, highlighting the utility of posters for presenting research, networking, and professional development in archaeology. Poster presentations are central to the SAAs, and presenting posters provides new opportunities for students, including applying for the annual SAA Student Poster Award.

**Gonzalez, Edith (University at Buffalo SUNY)**

[166]

*Island Laboratory: The Global Flow of Agricultural Knowledge from Barbuda, West Indies*

This paper traces the interaction between people and the environment in the West Indies, through archaeological and archival investigations of sugar plantations in the island nation of Antigua and Barbuda. Using materials from the Eccles Centre for American Studies at the British Library and estate records at the Bodleian Library, it examines how ideas—specifically botanical knowledge from British academic institutions and traditional ecological knowledge from enslaved people on Barbuda—moved through the empire. Throughout the eighteenth century, the Codrington family owned sugar estates in English Caribbean colonies. They held several plantations in Antigua and leased the entire island of Barbuda. Large-scale sugar production on the island of Antigua created dramatic ecological disturbance. The immediate environmental consequence on Antigua was a scarcity of fresh water, so Barbuda became an agricultural laboratory to discover drought resistant crops to supply sugar estates with provisions when political conflict interrupted the Atlantic trade networks. This research seeks to place the culture of Barbuda in the wider context of global exploration and economy, and highlight the specialized relationship to the land and wealth of traditional ecological knowledge that became a cornerstone of emergent indigenous Barbudan culture.

**Gonzalez, Edith (University at Buffalo SUNY)**

[212]

*Moderator*

[166]

*Chair*

**Gonzalez, Sara (University of Washington, Seattle)**

[121]

*Telling Survivance: Connecting the Past with Present in Archaeologies of Colonialism*

In advocating for holistic, diachronic, and broadly comparative approaches to colonialism that directly integrate Indigenous perspectives, Kent Lightfoot's research at Fort Ross provides a model for connecting colonial pasts with their legacies in the

present. Drawing on my community-based partnership with the Confederated Tribes of Grand Ronde, I examine the broader impacts of a holistic, diachronic, broadly comparative, and engaged archaeology of colonialism. Specifically, I argue that connecting past and present through engaged, collaborative practice with Indigenous nations is critical for the field in three regards. First, such an approach recognizes that Indigenous communities today continue to grapple with the structures and ongoing violence of settler colonialism. Second, it is rooted in the acknowledgement of tribal sovereignty. And, finally, it is oriented in the enduring presence of Indigenous communities today, what Anishinaabe scholar Gerald Vizenor refers to as survivance.

**Gonzalez, Sara (University of Washington, Seattle)**

[121]

Chair

Gonzalez, Sara [141] see Leonard-Doll, Katy

Gonzalez, Nicholas [158] see Jaramillo, Sara

Gonzalez Barba, Gerardo [63] see Meraz Munguia, Miriam

**González Gómez De Agüero, Adrián (Trent University), Francesca Fernandini (Pontifical Catholic University of Peru) and Paul Szpak (Trent University)**

[92]

*Agricultural Practices at Cerro de Oro, Cañete Valley, Peru: An Isotopic Investigation*

Isotope analysis on plants reflects the environmental conditions under which the plants were grown. For example, high plant  $\delta^{15}\text{N}$  values may be related to the use of natural fertilizers such as llama dung or seabird guano, burning/shifting cultivation or tillage and others forms of agricultural intensification. This research aims to study agricultural practices at Cerro de Oro in the Cañete Valley, Peru, during the transition between the Early Intermediate period and the Middle Horizon. Agricultural products represented a very important part of the diets of the inhabitants of the site and irrigation was necessary to support large-scale agriculture, but little is known about other methods of agricultural intensification, such as crop amendments. The isotopic data from the plant remains shed light on the ways in which the inhabitants of the site used fertilizers and how these practices varied over time. Understanding these practices allows us to assess how the agricultural economy supported this growing monumental site of great regional importance.

Gonzalez Herrera, Ulises [19] see Chinique de Armas, Yadira

Gonzalez Herrera, Ulises [125] see Reyes, Idali

**Gonzalez La Rosa, Luis Manuel (University of Toronto), Aleksa Alaica (University of Alberta) and Kelly Knudson (Arizona State University)**

[157]

*Migration or Seasonal Mobility? Weaving Together Age, Isotopes, and the Vertical Archipelago in Northern Peru*

Debates on the mobility of past human populations have focused on nonlocal material culture and biomolecular analyses of human remains. An undervalued proxy for human mobility rests in the zooarchaeological record. Dogs and closely managed livestock animals often accompany human communities during seasonal mobility and migration. We tap into this wealth of information by exploring the age profiles of camelid and human remains from the Late Moche site (CE 600–900) of Huaca Colorada to address the temporalities of mobility among human and nonhuman animals. Interwoven with isotopic analyses this investigation tracks the life histories of humans and their livestock during a transformative period in the Andean past. Results from human ( $N = 21$ ) and camelid ( $N = 152$ ) teeth reveal that females were spending part of their pregnancies in highland environments. Young people were interred at Huaca Colorada in tandem with juvenile camelids of coastal origin. We argue that commensal politics underscored the gathering of long-distant kinship groups engaged in the transformation of the Moche political economy in the face of imperial expansion and highland interactions at the end of the first millennium CE. This paper emphasizes that detailed age analyses must accompany isotopic research to differentiate migration from seasonal mobility.

Gonzalez Tepetla, Julio [56] see Conti, Alberto

**Goodale, Nathan (Hamilton College) and Colin Quinn (Hamilton College)**

[83]

*Inter-analyst Reliability and Replicability of Curation Indices*

One of the most productive recent advancements in the study of lithic technological organization has been a greater understanding of stone tool use-life history. William Andrefsky Jr. directly contributed to studies of stone tool curation with indices or ratios of realized to maximum tool utility. Archaeologists have employed curation indices to better understand human utilization of stone as a tool resource. Using curation indices, researchers have been able to discuss the implications of raw material quality and availability, how stone tools are embedded in past human lifeways and procurement practices, and the socioeconomic relationship between human behavior and the activities that they engage in. The utility of these interpretations, however, are built on an assumption that the measurements that underpin these indices are both reliable and replicable. In this paper, we test three reduction indices for reliability and replicability when they are employed by different lithic analysts. Results indicate that while some indices are more

reliable, their replicability is variable. Based on these results, we suggest some best practices for developing new, and applying existing, curation indices.

**Goodale, Nathan (Hamilton College)**

[83]

Chair

Goodale, Nathan [83] see Prentiss, Anna

Goodman, Beverly [154] see Rissolo, Dominique

**Goodwin, Rebecca (University of Western Ontario), Lisa Hodgetts (University of Western Ontario), Albert Elias (Inuvialuit Elder), Shirley Elias (Inuvialuit Elder) and Mervin Joe (Parks Canada)**

[140]

*Stories, Knowledge, and Memories: The Use of Digital Storytelling to Share Inuvialuit Knowledge*

The process of archaeological research often extends beyond traditional field sites, affecting descendant communities and generating more than just archaeological knowledge. While the repatriation of objects and ancestors have become important concerns in the discipline, discussions around the repatriation of knowledge are still lacking. Archaeologists often rely on Indigenous Knowledge Holders to provide the oral history required to understand the material record but rarely consider how this documentation can also benefit the community. In this paper, we will discuss one method of digital repatriation, the use of digital storytelling methods to share Inuvialuit Pitqusiṁik Iṁisimaniq (Inuvialuit Knowledge) with youth. We will describe our collaborative oral history research, demonstrating how we transform aspects of archaeological knowledge production into useful educational materials for descendant communities. We will also explore the use of social media for reaching non-archaeological audiences.

**Goodwin, Whitney (University of Missouri), Leslie Reeder-Myers (Temple University) and Marlen Aguilera Rosales (Universidad Nacional Autónoma de Honduras)**

[82]

*Socio-ecological Resilience at the Selin Farm Site, Northeastern Honduras*

The Selin Farm site (AD 300–1000) in northeastern Honduras sits along the edge of the Guaimoreto Lagoon and the Caribbean coast and at the border between Mesoamerica and Central America. For nearly a millennium, this community leveraged their unique location to navigate significant social, cultural, and environmental change. Our interdisciplinary investigation of the site addresses two questions. First, how has the local fishery responded to sea-level rise and climate change, landscape modifications through both natural and cultural processes, and human resource use over time? Second, how do people in the community leverage their own traditional ecological knowledge and cultural foodways to create resilience in the face of external factors beyond their control? While the lagoon and surrounding landscape played an important role in the lives of the people at Selin Farm, their socio-ecological system also interacted with larger economic, political, and social networks. Between AD 800 and 1000, inhabitants of the site shifted their social and political networks toward the south. Rather than following regional trends toward decentralization and population decline, coastal groups in northeastern Honduras used their location in a borderland to their advantage, resulting in a long-term trajectory of stability and increasing centralization despite significant societal change.

Goodwin, Whitney [154] see Reeder-Myers, Leslie

Goodwin, Whitney [220] see Ronsairo, Karleen

**Gorczyk, John (Cornell University)**

[85]

*Rooting for Answers: Exploring Human-Pig Interactions during the Early Neolithic in Southeastern Europe*

The early Neolithic in southeastern Europe was characterized by novel relationships as humans and animals adapted to each other's biological requirements and rhythms while migrating into new environmental niches. Zooarchaeological, isotopic, and genetic work have revealed much about the timing and characteristics of spreading human-animal communities during this time. For example, throughout the region Neolithic communities relied heavily on caprine and cattle husbandry to supplement a subsistence base overwhelmingly reliant on domesticated cereal crops. Other components of the Neolithic "package"; namely, pigs, are often less numerous in faunal assemblages, leading to homogenous explanations for their presence. This paper presents data from Slatina, an early Neolithic site in northeastern Bulgaria, where the low number of pig remains precluded detailed compositional, demographic, and biometric analyses. However, the stable isotopic results showed marked contrast with pigs from other sites, suggesting that pig husbandry was a variable practice across the early Neolithic. These data permit a glimpse into the lived experiences of pigs and their people, demonstrating how researchers can move past the problems of low sample size and focus on the non-subsistence roles of animals, including their place in local landscapes and the potential for them to form intimate bonds with humans.

**Gore, Angela (Center for the Study of the First Americans, Texas A&M University)**

[213]

*Wait Wait . . . Don't Tool Me: Toolstone Provisioning in the Nenana Valley, Alaska*

The interior Alaskan record is important to understanding dispersals and adaptive behaviors of the earliest Eastern Beringians. How did early Beringians and subsequent populations subsist upon the landscape and adapt to shifting climates? The lithic record of the Nenana Valley, interior Alaska, offers an opportunity to explore toolstone procurement and selection behaviors, providing further

insight into human response to cultural and environmental change. Geochemical techniques such as portable X-ray fluorescence (pXRF) are used to explore toolstone procurement strategies in the record. pXRF studies thus far have been largely focused on obsidians, though obsidian artifacts are few in interior Alaskan assemblages. Non-obsidian fine-grained volcanic materials (e.g., rhyolites, dacites, andesites and basalts) are comparatively abundant in Nenana Valley assemblages; thus, geochemical investigation of these materials have the potential to provide a more holistic picture of toolstone provisioning behaviors. This paper presents results of my dissertation research integrating regional raw material surveys, pXRF geochemical analyses of non-obsidian volcanic artifacts, and lithic technological analyses of 19 late Pleistocene and Holocene assemblages from the Nenana Valley to provide an in-depth look at toolstone provisioning through time.

Goriunova, Olga [198] see Schulting, Rick

**Gowland, Rebecca (Durham University)**

[17]

*Discussant*

Grados, Aaron [29] see Tavera Medina, Ana Carito

**Graf, Kelly, Ted Goebel (CSFA, Texas A&M University) and Julie Esdale (CEMML, Colorado State University)**

[105]

*The McDonald Creek Archaeological Site, Tanana Flats, Interior Alaska: An Update*

Since 2013, Colorado State University and Texas A&M University have been collaborating on a multiyear, multidimensional research project to investigate use of the Tanana Flats area of Interior Alaska, especially focusing on excavation work near Blair Lakes. Here we deliver an update on one facet of this research, excavations of the oldest layers at the McDonald Creek site. This site is situated in eolian deposits that mantle an ancient remnant of an alluvial terrace of the Tanana River. It contains three cultural components, dating to ~13.8 ka, 13–12.7 ka, and 6–4 ka, respectively. The two oldest, terminal Pleistocene, components preserve thousands of lithic artifacts, faunal remains, paleoethnobotanical remains, and diverse features. These components are providing new and interesting views of hunter-gatherer lifeways in eastern Beringia.

**Graf, Kelly**

[112]

*Discussant*

Graf, Kelly [31] see Shelley, Nathan

Graf, Kelly [120] see Smith, Heather

**Graff, Rebecca (Lake Forest College)**

[182]

*Excavating Archaeology and Architecture at Three Chicago Homesites: The Gray-Cloud House, the Charnley-Persky House, and Mecca Flats*

Chicago's civic identity is intimately tied to its nineteenth- and twentieth-century architectural heritage. Daniel Burnham's Beaux-Arts architectural program of the 1893 World's Fair, the Chicago School of architecture and its steel-framed skyscrapers, Louis Sullivan's "form follows function" aesthetics, Frank Lloyd Wright's prairie homes, Ludwig Mies van der Rohe's modernist boxes—all are heralded, evoked, and monetized as a central part of what the city is supposed to offer to the world. As an archaeologist who excavated at some of these famous sites of academic architectural significance, I am interested in the ways that the practitioners of archaeology and architectural history engage in disciplinary boundarywork that sometimes obscures their different ontological and epistemological assumptions about the built environment. This paper draws from work at three Chicago homesites: the Charnley-Persky House, an elite white residence on Chicago's Gold Coast, long studied for its architectural significance as an example of Louis Sullivan and Frank Lloyd Wright's domestic design; the Gray-Cloud House, a purported station on the Underground Railroad in the Old Irving Park neighborhood; and the vanished Mecca Flats, a center of the Black Metropolis during the Great Migration era that was demolished via urban renewal and its concomitant structures of racism.

Graff, Rebecca [50] see Fennell, Catherine

Graham, Anna [49] see Kassabaum, Megan

**Graham, Elizabeth (Institute of Archaeology), Richard Macphail (UCL, Archaeology), Julia Stegemann (UCL, Environmental Engineering), Simon Turner (UCL, Geography) and Daniel Evans (Cranfield University)**

[50]

*A Dirty Business*

Our research on Ambergris Caye, a coral island on Belize's barrier reef, focuses on decomposition rather than on preserved fragments of what people have left behind. In other words, we are looking at the bulk of what constitutes archaeological deposits: dirt. Where dirt serves as a medium for plant growth, we call it "soil." Comparing the thickness of soil where people have lived to thickness where there has been no human occupation shows much greater accumulation where humans have been active. Soils at

archaeological sites are also often characterized by higher fertility—what we call Maya Dark Earths—than soils formed naturally over the same parent materials. The implication is that the decomposition of what people throw away, leave behind, or bury forms soil—and lots of it. Yet, we do not characterize the landscapes where we choose to dig as wastelands because they have been altered by time. Our mission, given modern threats to soil security, is to apply what we are learning from wastelands of the past to the treatment of, and attitudes toward, waste and garbage today. Recycling is commendable but puts off the inevitable. We need to embrace waste as the soils of the future.

**Graham, Elizabeth (Institute of Archaeology)**

[218]

*Discussant*

Graham, Elizabeth [218] see McLellan, Alec

**Grant, Christopher (University of Chicago)**

[80]

*Styling the New Urban South: Working Women in Afro-Creole New Orleans, 1880–1920*

Faubourg Tremé is often referred to as America's oldest African American neighborhood and has been the site of significant sociocultural and political developments in New Orleans for the past two centuries. From the colonial period onward, the neighborhood fostered the growth of the city's Creole population and displayed a distinct cultural and demographic makeup unmatched in other parts of the American South. Following emancipation, the city's *ancienne* population entered a period of social and economic decline—but beauty work and hair care offered women opportunities for styling new urban communities structured on autonomy and entrepreneurship. Work in the beauty and hair care industries allowed for the development of new urban social bodies and styles, both challenging the traditional racial hierarchies that had long portrayed the Creole city. Assemblages from a late-nineteenth/early-twentieth-century household in the Tremé neighborhood provide evidence of new gendered labor formations that took shape after the Civil War. This paper examines how these labor forms—and their associated material culture—assisted in managing the effects and legacy of slavery in the city.

Grau González-Quevedo, Esteban [44] see Hernandez-de-Lara, Odlanyer

**Grauer, Kacey (Stanford University)**

[142]

*Moderator*

[142]

*Discussant*

**Graumlich, Emma and Jessi Halligan (Florida State University)**

[116]

*Paleoenvironmental Analysis through Gastropods at the Page-Ladson (8JE591) Inundated Terrestrial Site, Northwest Florida, USA*

Excavations at the Page-Ladson site located within the Aucilla River in northwestern Florida have revealed extensive inundated sediment sequences dating from approximately 16,000 to 8,500 years ago. These sediments contain artifacts that span from the pre-Clovis period (14,500 years old), through the Clovis period (13,200 years old), and into the Early Archaic period (11,200 years old). In addition to stone tools and megafaunal bones that inform about the intricacies of pre-Clovis lifeways, sediments house environmental indicators that contribute to our greater understanding of the regional paleoenvironment. One such indicator is preserved gastropod shells. Gastropods, a large taxonomic class within the phylum Mollusca, are one of the most valuable proxies for reconstructing past environments. This is due both to their ubiquitous nature at archaeological sites and the organism's sensitivity to even the slightest of environmental changes. Through the sampling and analysis of gastropods at the Page-Ladson site, this study hopes to increase our understanding of the local environment experienced by the site's inhabitants, to help explicate the tempo of late Pleistocene and early Holocene environmental changes at the site, and, when combined with other extensive paleoenvironmental proxy records from the site, demonstrate the unique utility of gastropods for paleoenvironmental reconstruction.

**Grávalos, M. Elizabeth (Field Museum)**

[92]

*Crafting the Casma Polity: Compositional Analysis of Ceramics from Peru's Casma Valley Held in Field Museum Collections*

The Casma polity is notable for defying Andean sociopolitical trends, maintaining power when other polities were failing (e.g., the Moche). Research demonstrates that the first Andean states consolidated power at the onset of the Middle Horizon (ca. AD 600–1000), with their subsequent dissolution toward the early Late Intermediate period (ca. AD 1000–1450). But the Casma polity's trajectory was different—they coalesced around AD 700 and sustained power until they were colonized by the Chimú Empire approximately seven centuries later. How did they persist at a time when other polities declined and local communities experienced hardship elsewhere? Previous research hypothesizes that the Casma were successful because they were highly integrated across several northern coastal valleys. To begin evaluating the sociopolitical integration of the Casma polity, this study presents a preliminary compositional analysis of Casma ceramics held in the Field Museum's collections. Former curator Donald Collier systematically collected pottery fragments from the lower Casma Valley in 1956, making up the majority of the Field Museum's Casma collection. Here I present the results of laser ablation–inductively coupled plasma–mass spectrometry (LA-ICP-MS) and thin section petrography of a sample of the Museum's collection to think through production and provenance.

Grávalos, M. Elizabeth [129] see Williams, Patrick Ryan

**Gravel-Miguel, Claudine (Arizona State University), Julien Riel-Salvatore (Université de Montréal), Fabio Negrino (Università di Genova) and Cristiani Emanuela (Sapienza—Università di Roma)**

[61]

*Combining Agent-based Modeling and Random Forest Algorithm to Study the Pleistocene-Holocene Occupation of Liguria, Italy*  
This research uses different types of computer modeling to predict the geographical location of archaeological sites dated to the Pleistocene-Holocene transition in the Liguria region (northwest Italy). It uses an agent-based model (ABM) to document the impact of topography on mobility in the region. The ABM models human mobility over different types of terrain, where walking speed is based on an algorithm calibrated with modern fitness tracking data. The ABM thus creates a map of the easiest paths one would travel through the coastal mountains of Liguria. This mobility map is then used, along with maps of topography and distance from water sources as independent variables for a Random Forest algorithm that uses the location of already known transitional archaeological sites as observations. It computes the sites' geographical 'requirements' to predict the likelihood of finding new settlements in places that have not yet been explored. This research also identifies the geographical characteristics that may have been the most influential for settlement during the Pleistocene-Holocene transition, and how those may have changed over time.

Gravel-Miguel, Claudine [61] see Brun, Catherine

**Graves, Michael**

[67]

*Integrating Aerial Photography with Lidar in Reconstructing the Boundary for the Leeward Kohala Field System, Hawai'i Island*  
Archaeologists attempted to estimate the spatial extent of the Leeward Kohala dryland agricultural field system for several decades now with the most recent effort based largely on lidar imagery for north Kohala, Hawai'i Island. Current estimates suggest the field system was about 60 km<sup>2</sup> in size. Limited lidar coverage and substantial land development in the northeastern, windward portion of Kohala create uncertainty about the boundary and hence extent of the field system in this area. Aerial photographic imagery, both historic (1950–1980) and recent (2000–2019), provide a supplementary means to identify locations of former dryland fields and to fill this gap. Creating a geographic information system of these fields suggests the extension of dryland agriculture well to the east and inland of the current boundary; its spatial extent is now estimated to be nearer 110 km<sup>2</sup>. Irrigated agriculture also occurred in a portion of windward Kohala indicating a mixed system of cultivation of greater and more reliable productivity.

**Graves, Timothy (Versar Inc.) and Myles Miller III (Versar Inc.)**

[118]

*Adding Form to the Formative: Michael Whalen's Contributions to Jornada Mogollon Research Viewed from the 1970s through the 2020s*

In 1977, Mike Whalen published "Settlement Patterns in the Eastern Hueco Bolson" that described the results of one of the first large-scale surveys in the southern Southwest. Nearly 20 years later he published his 1994 monograph on the Turquoise Ridge pithouse village. His two decades of work in the Jornada Mogollon region and numerous publications laid the foundation for most of the early exploratory period of research of the 1970s and 1980s. His work on settlement patterns, site testing methods, chronological studies, ceramics, architecture, the pithouse-to-pueblo transition, and residential mobility among early agricultural communities established the baseline data that guided much of the survey and excavation work of that early period. Many of his early discoveries and interpretations gave "form" to the Formative period of the region, and those discoveries and interpretations continue to resonate through the research of the twenty-first century. We review his influence from the perspective of the 1970s and 1980s, and how we can still detect undercurrents of his foundational research five decades later.

**Graves, William (Statistical Research Inc. and University of Arizona)**

[5]

*Power, Identity, and La Présence Plains*

I use Stuart Hall's concept of *présence* to explore the intersection of power and identity among the Jumanos pueblos, a group of late prehispanic and early colonial period pueblos in New Mexico occupied from AD 1300 to the 1670s. *Présences* are sets of relations, meanings, and material symbols that are variously combined to create identities. The Jumanos pueblos shared a group identity for hundreds of years that was constructed with reference to different *présences*, including cultural traditions and social relations with the southern Plains. This engagement with a *Présence Plains* also provided a critical avenue for prestige enhancement and the creation of inequalities among the Jumanos pueblos: bison acquisition. The distribution of bison remains is not equal among different sites, and the residents of one village, Gran Quivira, appear to have enjoyed greater access to socially valuable bison and the prestige that came from such access. Bison was procured through exchange with Plains groups, in part through the hosting of trade fairs and directly through hunting. Through such engagements with a *Présence Plains*, both power and identity were created, experienced, and transformed, and the Jumanos pueblos provide an ideal context to explore the complex relationship between these two social phenomena.

**Green, Paul**

[56]

*Assessing the Past, Mapping the Future: DoD's Goals and Objectives for Archaeology and Cultural Resource Management*  
DoD has provided serious funding for archaeology and CRM overall since the late 1980s. We consider how DoD and the military departments conducted CRM planning over this period, including notable successes, failures, and lessons learned or ignored. With

this picture in mind, we consider the gaps remaining, new challenges, and potential solutions for military CRM in the post-9/11 world.

**Green, Ulrike (Orange Coast College)**

[217]

*Community, Migration, and Cross-cultural Interactions: An (Attempted) Review of 30 Years of Archaeological Research in the Osmore Drainage*

The last 30 years have seen immensely active archaeological work in the Moquegua Valley, from the coastal valley all the way to the upper tributaries. This research, which built on the foundations of the early work of the Programa Contisuyu in the 1980s, has pushed us toward a much more nuanced understanding of ecology, migration, cultural change, and identity in the valley and provides a unique cultural narrative spanning from the Archaic period to the Late Horizon. In this paper I attempt to review this body research on a broader scale and seek to identify trends and changes in Moquegua archaeology over time. Some of our understanding transformed as new archaeological technologies and methods became available, for example, whereas other interpretations shifted with changing theoretical approaches. As this session shows, research in Moquegua encompasses a wide variety of topics ranging from migration, cross-cultural exchange, collapse, and ethnogenesis, to gender, diet, and labor to name a few. Additionally, insights from research in the Osmore drainage are not only locally significant, they also have far-reaching implications for Andean archaeology.

**Green, Ulrike (Orange Coast College)**

[217]

*Chair*

**Green, William (Beloit College and University of Iowa)**

[52]

*Intensification via Diversification: Initial Middle Missouri Plant Use Strategies*

Early villagers of the Initial Middle Missouri variant (IMMV) raised a wide variety of crops. They not only farmed the “Three Sisters” of maize (*Zea mays*), common beans (*Phaseolus vulgaris*), and squash (*Cucurbita* spp.), but they also continued growing native Eastern Agricultural Complex crops—goosefoot (*Chenopodium berlandieri*), sumpweed (*Iva annua* var. *macrocarpa*), erect knotweed (*Polygonum erectum*), sunflower (*Helianthus annuus*), and little barley (*Hordeum pusillum*)—as well as tobacco (*Nicotiana* sp.). They also collected fleshy fruits such as elderberry (*Sambucus nigra* ssp. *canadensis*), grape (*Vitis* sp.), and sumac (*Rhus* cf. *glabra*) and other wild plants. Within this mix, maize and goosefoot are routinely the most abundant and ubiquitous plant food remains at IMMV sites. While Joy Creek Major (13PM7) is no exception to this pattern, its assemblage is notable in the presence of pale-seed chenopods and amaranths. The latter resemble *Amaranthus hypochondriacus* and *A. cruentus*, cultigens of Mesoamerican origin heretofore undocumented in the Great Plains. The large suite of domesticated plants, coupled with documentation of IMMV ridged fields in the nearby Little Sioux River valley, indicates investment in intensification via diversification, a risk reduction strategy of food production similar to that posited by Gallagher and Arzigian (1994) for the Oneota tradition.

**Green, William (Beloit College and University of Iowa)**

[164]

*Discussant*

Greenwald, Alexandra [57] see Baka, Abby

Greer, John [107] see Greer, Mavis

**Greer, Mavis (Greer Archeology) and John Greer (Greer Archeology)**

[107]

*Northern Plains Migration as Reflected in Rock Art*

From earliest archaeological evidence the Northern Plains of North America have experienced continual geographic change in social, political, and cultural boundaries. Change is evident in alteration of artifact styles throughout the archaeological record, but also with temporal and regional shifts in rock art expression. Perhaps the most dramatic change can be seen in Native migrations resulting from Europeans expanding into and across the continent. Native populations responded to European movement—and similar advancement by other Native groups, such as the Sioux—by continually moving westward, often into smaller and smaller territories and into areas previously controlled by enemy nations. Such tribal resettlement resulted in the introduction of new kinds of rock art and expanded functions for existing sites. Rock art is one expression of group flexibility relative to continuing established rituals at traditional sites as well as developing new rituals that altered site orientation or use. Such sites exemplify how regions can be changed by incoming migrants to fit their needs and how this adaption affects previous residents continued use of the same land.

**Gregoricka, Lesley (University of South Alabama)**

[157]

*Discussant*

**Gregory, Andrea (MCX CMAC, US Army Corps of Engineers)****[81]**

Chair

Gregory, Andrea [81] see Joseph, J.

Gregory, Andrea [81] see Whitney, Kristina

**Gregory, Michael****[182]***Civil War-Era Camp Douglas's Archaeological Imprint and Its Significance*

Camp Douglas existed from mid-September 1861 to the end of December 1865. During this time, it grew to encompass 60 acres located on the southern outskirts of Chicago where it served as both a recruitment/training center and, beginning in February 1862, a Confederate POW facility. At the end of 1865, the federal government auctioned off camp structures, and thereafter, the camp faded from physical view while Northern interests actively sought to expunge Camp Douglas, as well as other federal POW camps from popular memory. The erasure of the camp was all but complete by the early twenty-first century, when a group of individuals formed the Camp Douglas Restoration Foundation Inc. in order to tell the story of the camp and determine if subsurface remains of the site existed. Since 2012, the foundation has sponsored more than 10 archaeological investigations of the camp. These excavations, which relied on volunteers, exposed camp deposits, raised public awareness about the site, and highlighted the site's connection to twentieth-century events while demonstrating that developed, urban areas may harbor significant archaeological remains. The results of the archaeological studies reaffirm that Camp Douglas is an important Chicago site whose story is worth investigating and telling.

Gregory, Michael [182] see Peterson, Jane

**Gregory, Teresa (Statistical Research Inc.) and Shelby Manney (Arizona Army National Guard/AZDEMA)****[56]***Arizona Army National Guard (AZARNG) Plans for Tracking, Organizing, and Storing Federally Protected CRM Data to Ensure Mission Readiness*

Cultural resource management (CRM) data contains some federally protected cultural sensitivity data such as archaeological site locations. CRM firms conduct surveys and excavations, as required by Section 106, producing reports and GIS (geographic information systems) data that benefits from proper tracking, organizing, and storing for efficient retrieval. The initial data gathered with a field collection application (e.g., Survey 123) is seamlessly uploaded into a developed geodatabase (GDB) and manipulated with programs like ArcGIS Pro. The GDB can store CR data as well as information from natural resource, environmental, remediation, and infrastructure data. A GIS Viewer (basically a digital map) utilizes that data for project planning by archaeologists and military planners. Esri Workflow Manager tracks the overall project workflow. AZARNG planned and built this system over the past five years and began utilizing it in 2020. Proper training is required for National Guard personnel and the quality control/quality assurance is overseen by qualified personnel—all under the direction of a GIS Manager. Hardcopy archival documents are backups to the digital library catalog. After all, easily retrievable data leads to faster mission readiness for our military troops.

Gregory, Timothy [67] see Kardulias, P. Nick

**Grier, Colin (Washington State University)****[216]***Between the Bookends: Persistence and Continuity in the Holocene History of the Northwest Coast of North America*

The term Archaic has seen limited use on the Northwest Coast despite being incorporated into the 1999 master chronology advanced by Ames and Maschner. Subsuming diverse local monikers, they define it as “the time period between the late Pleistocene and the rise of more permanent settlement, resource intensification, and changes in social organization.” This implies Archaic peoples can be characterized by what they lack, specifically the complexity attributed to later Northwest Coast peoples. More recent characterizations of the Northwest Coast emphasize continuity of practices across deep time, reflecting data that illustrate persistence of place, temporally extensive village settlement, long-term landscape management practices, and enduring monumentality. Given this, I consider how we might (and whether we should) retool the concept of an Archaic on the Northwest Coast, following on similar projects recently undertaken in other regions with complex hunter-gatherer-fisher groups. Such a project involves downplaying periodization and difference in favor of contemplating a more seamless and continuous past.

Grier, Colin [131] see Smith, Erin

Grieseler, Rolf [88] see Mauricio, Ana

**Griffith, Cameron (Texas Tech University), Cameron McNeil (Lehman College, City University of New York) and Edy Barrios (PARAC, Honduras)****[177]***Speleoarchaeological Reconnaissance in the Periphery of Copan*

In 1896–1897 George Byron Gordon investigated a series of caves in the Sesesmil River Valley of Honduras, north of the city center of Copan. Gordon's expedition is understood to be the first archaeological exploration of caves in the region, yielding numerous

artifacts as well as evidence for a plethora of different mortuary practices. Since Gordon's day there have been at least five different official scientific investigations of caves in the vicinity of Copan, in addition to numerous unofficial visits/explorations, including looting activity and resource procurement. In July 2018, as part of the Proyecto Arqueológico Río Amarillo, Copan, a team of PARAC crewmembers revisited a handful of caves around Copan. This reconnaissance and reassessment endeavor yielded additional information about the use of subterranean space by ancient Copanecos and shed new light on the artistic phenomenon known as Monumental Modified Speleothem Sculpture (MMSS). In this presentation we present some of our findings, which enhance the burgeoning knowledge base on the use of caves by the Ancient Maya.

**Grillo, Katherine (University of Florida)**

[122]

*Long-Term Legacies of the Pastoral Neolithic in Eastern Africa*

Archaeological research on the Pastoral Neolithic (PN) of eastern Africa, ca. 5000–1200 BP, has demonstrated long-term impacts of ancient herding societies on soil formation, grassland ecologies, wildlife communities, and other aspects of the region's anthropogenic dryland landscapes. Genetic data from eastern and southern Africa are likewise illuminating long-distance histories of pastoralist connection and migration. This paper will discuss what we don't know, so far, about legacies in other terms. What impacts, if any, did PN herders have on later Pastoral Iron Age and Iron Age farming communities? Can we discern any lasting and significant influence on the development of the region's political, religious, and/or social institutions? If not, why not? We perhaps feel compelled to justify pastoralism as a dynamic and broadly successful system in eastern Africa—and it is—but what are the implications of measuring significance by only the archaeologically visible traces of agentive herders?

**Grillo, Katherine (University of Florida)**

[6]

*Discussant*

Grillo, Katherine [94] see Fort, Casie

Grippo, Mark [24] see Wescott, Konnie

**Grishchenko, Vyacheslav**

[135]

*Discussant*

**Grogan, David (University of Notre Dame) and Mark Golitko (University of Notre Dame)**

[160]

*Population Density Predicts Buffer Zone Width: Implications for Archaeological Population Estimation*

Buffer zones—also referred to as "no-man's lands"—are a recurrent feature of conflict zones both historically and in the more distant past. These are regions that are left unoccupied either by mutual agreement or because it becomes too dangerous to enter them. In his 1996 book *War before Civilization*, Lawrence Keeley briefly noted a relationship between the width of buffer zones and the population densities on their margins. Using the eHRAF database and additional historical and ethnographic documentation, we have expanded his initial sample of 10 cases to a more robust sample that spans multiple world regions, subsistence types, and social organizational forms. We continue to find an extremely strong association between the two variables (once log transformed)—population density predicts buffer zone width. Ancient buffer zones have been identified through intensive settlement survey in a number of instances. In principle, their width can therefore be used to estimate ancient population densities. Here, we explore the potential of this method of population estimation as well as its shortcomings.

**Grone, Michael (UC Berkeley) and Alec Apodaca (UC Berkeley)**

[121]

*Collections and Curios: The Lightfoot Lab Legacy through Things Left Behind*

Upon arriving at UC Berkeley in the 1980s, Kent Lightfoot took over the California Archaeology Lab in Kroeber Hall and the associated storage locker in the basement of the Hearst Women's Gym. Kent has since had an illustrious career with considerable breadth, depth, and productivity, as displayed by the diversity of interests of his many graduate students and collaborators. As his last students, we have been charged with the task of consolidating, curating, and cleaning out the lab and associated storage locker. In this paper, we trace the development of the California Archaeology Lab's research projects under Kent's supervision through material remains left behind by his old graduate students and other remnants of past projects, hopefully providing a window into Kent's vision and influence along the way.

Grone, Michael [131] see Apodaca, Alec

Grone, Michael [141] see Sanchez, Gabriel

Grooms, Michael [31] see Sattler, Robert

**Grooms, Seth (Washington University in St. Louis) and Grace Ward (Washington University in St. Louis)****[4]***Hunter-Gatherer Histories and Social Landscapes in the Lower Mississippi Valley*

This paper discusses the Late Archaic lower Mississippi Valley (LMV) as a highly connected but socially diverse region. We present findings from the Jaketown and Poverty Point sites and discuss how hunter-gatherers engineered mounded landscapes that were powerful sociocultural catalysts. Considering higher-resolution chronologies and new geoarchaeological data from earthwork contexts at both sites, we suggest that the constructed landscapes of Jaketown and Poverty Point reflect shared practices lived out in different social contexts. Rather than a culture-historical unit based on the Poverty Point site, the terminal Late Archaic is more accurately understood as the coalescence of spatially and temporally extensive traditions of aggregation and mound building. At Jaketown, this process occurred from roughly 4500–3300 cal yr BP and resulted in post structures and mounds constructed using repurposed midden deposits along a then-inactive channel of the Mississippi River. The landscape of mounds, ridges, and post circles at Poverty Point was built slightly later, employing construction methods similar to those observed at Jaketown, though not identical and at a much larger scale. Comparing the built landscapes at these two sites leads us to suggest that the differences between them reflect real variation in the social structure and history of their builders.

Grosman, Leore [16] see Munro, Natalie

Grouard, Sandrine [85] see Giovas, Christina

Grover, Margan [24] see Gierak, Lynn

Gruber, Martin [157] see Göhring, Andrea

**Gruver, Steph (University of Florida), Kurt Rademaker (Michigan State University) and Matthieu Carre (Universidad Peruana Cayetano Heredia)****[22]***Paleoindian Occupational Seasonality and Mollusks*

Quebrada Jaguay 280 (QJ-280) is one of the earliest maritime archaeological sites in Peru. Located on the southern coast, QJ-280 was inhabited by hunter-gatherers from ~12,000 to 8,000 cal yr BP, from the Terminal Pleistocene to the Middle Holocene. Excavations conducted in the 1990s and 2017 recovered high volumes of marine faunal remains, particularly those of the mollusk, *Mesodesma donacium*. The ubiquitous species accounted for ~99% of the site's shell assemblage. An isotopic examination of the *M. donacium* remains allowed for a reconstruction of the occupational seasonality of QJ-280 as well as of the paleoenvironmental conditions experienced by its inhabitants. The results of the isotopic analysis indicated that QJ-280 was seasonally occupied during the austral summer, primarily during the months of February and March. It suggested that the lengths of habitation potentially doubled from the Terminal Pleistocene to the Early Holocene, from four to eight weeks. The paleoenvironmental reconstruction led to the identification of a Terminal Pleistocene-aged El Niño event that was directly associated with an anomalous October occupation. The isotopic examination of *M. donacium* remains from QJ-280 suggests that early hunter-gatherers likely modified their occupational patterns to adapt to long-term climate change and periods of environmental instability.

**Guderjan, Thomas (University of Texas, Tyler) and Colleen Hanratty (University of Texas, Tyler)****[48]***Before and After AD 500 in Northwestern Belize*

This paper examines the changes in public and royal residential in at the Maya city of Blue Creek in northwestern Belize after the death of an ahua at approximately AD 500. The dynastic lineage that controlled Blue Creek was replaced and the new royal lineage reconfigured the kawik to reflect their own worldview. To the west, Naranjo lost control of the outposts which controlled the east side of the Alacranes Bajo as they came under control of the small, city of Xnoha.

**Guebard, Matthew (National Park Service), Angelyn Bass (University of New Mexico) and Douglas Porter (University of Vermont)****[215]***Colored Plaster Washes in Central Arizona*

Since 2013 the National Park Service and the University of New Mexico have partnered to study earthen plasters and washes at the Montezuma Castle and Tonto National Monument Cliff Dwellings. To characterize plaster composition and investigate period craft practices, researchers combined in situ examination and instrumental analyses, including optical microscopy, X-ray diffraction, scanning electron microscopy, and energy dispersive X-ray spectrometry. Through this process, they have identified earthen plasters and washes selected or formulated for color as a principal form of architectural embellishment. Earthen finishes identified at each site were designed to produce white, red, and yellow colors related to visual symbolism and ideological concepts. A substantial body of archaeological literature exists on color and color symbolism in the American Southwest. These studies often focus on complex decorative motifs found on wall murals, ceramics, and other artifacts. Archaeological and architectural analysis conducted for this study along with traditional knowledge from tribal scholars and experts suggest that the study of monochromatic plaster can provide insight into aesthetic choices and color symbolism. Furthermore, by considering the meaning of colored plasters and washes in the context of other art forms and traditional knowledge, researchers can gain insight into a site's history and significance.

**Guedes, Jade (University of California, San Diego)****[10]***A Deep History of Human Activity in the Jiuzhaigou National Park*

China's *tuigeng huanlin*, or "Returning Farmland to Forest," program has been widely praised as a major contributor to China's dramatic increase in forest cover from perhaps as low as 8% in 1960 to about 21% today. Located on the margins of the eastern Tibetan plateau, the Jiuzhaigou National Park is home to over 1950 species of plants along with many animals—at least 50 of them rare or endangered. In order to preserve the biodiversity and the scenic lakes found in the Jiuzhaigou National Park and believing that the history of human impact inside the park was relatively short (less than 200–300 years), authorities decided to remove human impact, resettling nine villages of Amdo Tibetans who originally occupied the area. Since 1999, park policies have prohibited residents from farming, and wood cutting and herding animals above the treeline. Recent archaeological, archaeobotanical, and zooarchaeological evidence from the park is now challenging assumptions about the shallow time depth of human occupation in the region and shows that rather than harming local biodiversity, intermediate levels of disturbance created by small-scale farming, pastoralism and tree cutting contributed to the biodiversity of this region over the past 5,000 years.

**Guengerich, Anna (Vanderbilt University) and Patrick Ryan Williams (Field Museum of Natural History)****[87]***Head for the Mountains: Sourcing Tiwanaku's Stone Monoliths*

John Janusek revolutionized the way scholars examine the monumental sculptures, or monoliths, that embodied Tiwanaku's venerated ancestors in lithic form. Whereas previous approaches had focused on the interpretation of iconography within an Andeanist paradigm, Janusek first approached them from the perspective of political ecology, recognizing their centrality to Tiwanaku ritual practices premised on the animacy of altiplano landscapes. Monoliths tied together constructed spaces and objects with a broader landscape of astronomical elements, water features, and the mountain apus from which they were quarried. In this paper, we present data from two projects developed with Janusek, which we use to argue that changes in the materiality of monoliths reflected geopolitical shifts that occurred as Tiwanaku expanded to encompass new territories and new locales of animate potency. We address the shift from sandstone from Kimsachata and other local ranges, to the incorporation of volcanic stone from locales farther afield, especially across Lake Titicaca. We focus on XRF sourcing data from Tiwanaku's monoliths and the quarries and source locales of volcanic stone surveyed with Janusek and consider what the variable use of these sources for different sculptures may add to a political ecology perspective of Tiwanaku's history.

Guerra, Rafael [91] see Marshall, Aubree

Guerra, Rafael [96] see Roa, Ian

Guerre, Lisa [77] see Napora, Katharine

**Guida Navarro, Alexandre****[79]***New Evidence for Late First-Millennium AD Stilt-House Settlements in Eastern Amazonia*

Archaeological evidence for stilt-house settlements, or pile dwellings, has been recorded in diverse wet environments around the world. The first-millennium AD stilt-house villages in the Brazilian state of Maranhão, however, are poorly known. Difficulties in conducting archaeological investigations in seasonally flooded areas have restricted our ability to understand the societies that lived in these unique settlements. The results of recent fieldwork using noninvasive techniques to map, date and characterize these sites point toward a number of similarities and differences in their spatial organization, material culture, and social structure. These interpretations are compared to present-day stilt-house settlements to provide insight into one of Brazil's least-known archaeological traditions.

Guilbault, Kari [193] see Buzon, Michele

Guiry, Eric [39] see Szpak, Paul

**Gunn, Joel (University of North Carolina, Greensboro)****[48]***536 CE Crisis and Its Aftermath in Mesoamerica: A Global View*

Previous research has shown that the impacts of the 536 CE and following years were influenced by at least three major volcanic eruptions and possibly other worldwide climate influencing conditions. This paper explores some of these conditions and the likelihood they had notable influences on cultural change in the Maya Lowlands.

**Gunn, Joel (University of North Carolina, Greensboro)****[48]***Chair*

Gunn, Joel [11] see Folan, William J.

**Gupta, Neha (University of British Columbia)****[36]***Discussant*

Guralnick, Robert [85] see Delsol, Nicolas

**Gusev, Sergey (If)****[135]***Discussant***Gutiérrez, Gerardo (University of Colorado Boulder)****[13]***The Role of the Tax Collection Bureaucracy in Southern Mexico during the Postclassic Period*

I will analyze the roles of Aztec imperial governors, regional lords, and provincial and local tax collectors in the realm of tax revenue and its critical importance in supporting the Aztec expansion and other economic activities. I review here with a fresh perspective what the documentary resources of the Codex Azoyú 2, Reverse side, Codex Humboldt Fragment 1, and the "Información de 1554 sobre los tributos que los indios pagaban a Moctezuma" provide as to insights into the workings of the political economy of the Aztec Empire.

Gutiérrez, María [85] see Belardi, Juan

**Gutierrez, María de la Luz (Instituto Nacional de Antropología e Historia, BCS, México)****[79]***The Construction of Symbolic Landscape in the Northern Cordilleras of Baja California Sur, Mexico*

In the north of Baja California Sur, there is abundant archaeological evidence that shows how the natural landscape was modified by human communities since ancient times. Our understanding of the sociocultural context in which these people experienced their world and built the landscape has deepened; their mobile lifeway involved human interaction at the individual, group, and intergroup level, as well as the interrelation of people with other animate or inanimate entities of their reality. They "walked the earth" due to multiple reasons, leading, at times, the varied constituents of their near and distant horizons to reveal themselves to their consciousness and in each initial event, certain spaces and places were signified, developing strong ties to them. In this way, the social construction of the symbolic landscape has a strong relational and referential connotation and, during this process, the landscape also shaped these peoples and was a crucial element for the foundation and consolidation of their individual and social identities. The presentation will present information that allows to visualize how people articulated their actions and satisfied their needs, organized the spaces that cyclically inhabited and signified them using various strategies, among which the production of rock art is particularly salient.

Gutierrez, Sebastian [155] see Sepúlveda, Marcela

Guttenberg, Richard [131] see Ainis, Amira

Guzman Camacho, Fabiola [63] see Meraz Munguia, Miriam

**Gyucha, Attila (University of Georgia), William Parkinson (University of Illinois at Chicago and Field Museum) and Richard Yerkes (Ohio State University)****[2]***Nucleation, Monumental Construction, and Social Transformations: The Long-Term Development of a Neolithic Settlement Complex on the Great Hungarian Plain*

Recent research at several Neolithic tells in Southeast Europe commonly has revealed contemporaneous external settlements that were established in their immediate surroundings. Supported by advances in field and analytical methods, these new results allow researchers to make inferences about the chronological and spatial development of these nucleated settlement complexes. Moreover, alterations in the overall layout and shifts in the functions of specific locales over time provide insights into sociopolitical developments at these sites. In this paper, we outline the evolution of the Neolithic Szeghalom-Kovácsshalom tell-centered settlement complex in the southeastern part of the Great Hungarian Plain. We focus on the site's temporal, demographic, and architectural developments as they relate to shifts in community organization over time. We argue that the growing population and competition among subgroups resulted in recurring modifications in the social and political structure of the Szeghalom-Kovácsshalom settlement. We suggest that the tell served as an important identity anchor for the aggregated community as it changed over time.

**Gyucha, Attila (University of Georgia)****[2]***Chair*

**Haas, Jennifer (University of Wisconsin–Milwaukee)****[227]***Archaeological Investigations within the Middle Fox River Passageway: Oneota and Late Woodland Lifeways at Neenah Point and Wisconsin's Burial Sites Law*

In 2020, the University of Wisconsin–Milwaukee conducted archaeological investigations within the Entire Road site (47WN0562/BWN-0213) identifying a substantial village and cemetery with Oneota Tradition and Late Woodland occupations. The site extends for nearly a half-mile along the western shore of Lake Winnebago in the City of Neenah, within eastern Wisconsin. The paper is presented in two parts. First, the paper reports on the archaeological findings, including the identification of several residential houses, an extensive cemetery, and associated mortuary areas. Given the regional historic narratives documenting eighteenth- and nineteenth-century villages at nearby Doty Island as well as the early nineteenth-century Winnebago Rapids Mission located on Neenah Point, conspicuously absent from the site is evidence of proto-historic or post-contact occupations. Secondly, given the presence of a cemetery, and mortuary areas throughout the site, this paper presents a case study for the practical application of Wisconsin's burial sites law. The protocols developed and practiced for the Entire Road site highlight the importance of collaboration among archaeologists, descendant communities, project sponsors, and agency stakeholders.

**Haas, Jennifer (University of Wisconsin–Milwaukee)****[227]***Chair***Haas, Randy (University of California, Davis)****[10]***The Evolutionary Ecology of Non-gendered Big-Game Hunting*

The recent observation of early female burials in association with big-game hunting tools suggests that subsistence labor was relatively non-gendered in the early Americas. This inference raises the question of why female foragers should engage in big-game hunting given the constraints of pregnancy, breast feeding, and child care. This paper explores how sex-based life history traits intersect with optimal foraging and other dimensions of human behavior such as cooperative hunting, hunting technology, and mobility. The analysis points to a range of conditions under which we should expect big-game hunting to be gendered or non-gendered. The resultant model creates a theoretical context for archaeological observations of early female hunter burials and offers a series of predictions to guide future research on the evolution of gendered labor practice among forager societies.

**Haas, Randy (University of California Davis)****[51]***Chair*

Haas, Randy [38] see Chen, Jennifer

Haas, Randy [51] see Snyder, Thomas

Haas, Randy [26] see Watson, Jim

**Habicht-Mauche, Judith (University of California, Santa Cruz), Suzanne Eckert (Arizona State Museum), Danielle Huerta (University of California, Santa Cruz) and David Ingleman (University of California, Santa Cruz)****[41]***Archaeologies of Practice: Research in Honor of Judith A. Habicht-Mauche*

This symposium honors Dr. Judith Habicht-Mauche's substantial accomplishments and enduring legacy within the field of archaeology. Drawing on feminist, Marxist, and situated learning theories to interpret ceramic technology, her scholarly insights have revealed important aspects of identity and community formation in the American Southwest and Plains. In addition, her innovative application of lead-isotope analysis to Southwestern glaze-painted pottery serves as a methodological model with broad applicability. Widely respected by her peers, Dr. Habicht-Mauche's accolades include some of the most prestigious awards and honors bestowed by the Society for American Archaeology (SAA), including the Award for Excellence in Archaeological Analysis (2009), the Outstanding Poster Award (1997), and the inaugural Dissertation Award (1988). Dr. Habicht-Mauche has also excelled as a teacher of archaeological method and theory, as well as a mentor to young scholars, and was nominated for the Phi Beta Kappa Northern California Association Excellence in Teaching Award (1995). Other archaeologists have come to know and respect Dr. Habicht-Mauche through her SAA committee service. In this session, current and former students and colleagues present work inspired by and celebrating Dr. Habicht-Mauche's decades of pathbreaking research and devoted mentorship, as well as her dutiful service to the field.

Habicht-Mauche, Judith [41] see Agostini, Mark

Habicht-Mauche, Judith [41] see Duff, Andrew

Habicht-Mauche, Judith [41] see Ferguson, Jeffrey

Habicht-Mauche, Judith [41] see Schleher, Kari

**Habu, Junko (University of California Berkeley)****[135]***Discussant*

**Hackenberger, Steven (Central Washington University), James Brown (Washington State University) and James Chatters (Applied Paleoscience)****[47]***Responses to Paleoclimate Variation on the Columbia Plateau: Conflict, Settlement Distribution, and Subsistence Patterns*

Columbia Plateau climate fluctuated throughout the Holocene. Initially warm and arid, the climate moderated during the last 3,800 years. It was marked by cooling during the Neoglacial, and then punctuated by two major warmer and drier episodes before the Little Ice Age. Changes in subsistence, settlement, and conflict often coincided with these climatic events. Early settlement and subsistence began as generally mobile forager systems and ultimately developed into semi-sedentary collector systems. During an earlier period of climatic cooling between 4800 and 4100 cal BP, settlement became more sedentary. Then, after 3800 cal BP subsistence developed to include mass production and food storage and a semi-sedentary pattern emerged. Episodes of house construction represent steps in these developments. Aggregated pithouse groups developed after 2500 cal BP. We compare climatic proxies with radiocarbon records of houses, storage features, defensive sites and structures, and traumatic injuries in human remains to explore relationships among them. Conflict is evident on the Columbia Plateau for much of its history, but accelerated during the last 2,000 years. Several scenarios may explain this phenomenon. Multiple factors include climate-induced changes in big game, salmonids and roots, regional population trends, and population aggregation itself.

Hackenberger, Steven [115] see Deans, Benjamin

Hadden, Carla [77] see Napora, Katharine

**Hadley, Dawn (University of York)****[17]***Crime and Punishment in Early Medieval England: Defining Adolescent Wrongoers*

This paper explores the treatment of adolescents in the legal system of early medieval England with a focus on execution. Law-codes establish those crimes that would lead to punishment by execution, including theft, arson, sorcery, violation of the king's peace, plotting against one's lord, and drawing weapons in the king's hall. According to these law-codes, even the youngest adolescents could be held legally accountable, and run the risk of punishment by execution. Around 30 cemeteries in which executed individuals were buried have now been identified from evidence for decapitation, bound limbs, and various unusual and disorderly burials. They were typically remote from settlements and on administrative boundaries, but simultaneously in visible locations near major routeways and prehistoric barrows; excluded but also manifestations of the consequences of crime and sin. This paper examines what the archaeological evidence reveals about how adolescents, defined socially and biologically as those who were neither a child nor yet fully adult, were treated in this context of judicial punishment. While younger adolescents are rarely to be found in execution cemeteries, older adolescents often make up a large proportion, and the paper will address what this reveals about early medieval attitudes to adolescence.

**Haffner, Jacob (University of Oklahoma), Hannah Mattson (University of New Mexico), Kari Schleher (University of New Mexico), Laura-Isobel McCall (University of Oklahoma) and Cecil Lewis (University of Oklahoma)****[173]***A New Approach to Organic Residue Analysis: Archaeological Metabolomics*

For archaeological residue analysis, mass spectrometry (MS) is a commonly used tool for characterizing ancient molecules whose detection informs about past human behavior and geographic origin. Such MS-based methods are increasingly common for organic residue analyses. Analytical chemists in the fields of proteomics and metabolomics commonly use MS and often work with archaeologists in generating MS data. The Metabolomics Standards Initiative has established minimal information standards for metabolomics analyses, including guidelines for data reproducibility. However, these expectations have not always been conveyed between archaeology and analytical chemistry, resulting in published archaeological studies lacking necessary detail for data reproducibility, including instrumental protocols and data processing steps. This project provides a contribution to standards between archaeology and analytical chemistry in the context of a MS-based metabolomics study of archaeological ceramics from the American Southwest. Our preliminary results reveal potential biomarkers of past cultural activity, but also point to signs of modern contamination despite using protocols standard in other degraded-biomolecule research, such as ancient DNA. We find that MS-based archaeological studies must exceed the contamination control measures of ancient DNA research and follow Metabolomics Standards Initiative standards for reproducibility, which we discuss in the context of archaeological residue analysis.

Hair, Amy [92] see Chicoine, David

Hajek, Kelli [161] see Jones, Eric

**Hajovsky, Patrick****[55]***Aztec Royal Portraiture and Bodily Presence*

In Diego Durán's history of the Aztecs, there were five portraits of rulers carved at Chapultepec, stemming from a tradition that began with Moteuczoma Ilhuicamina and ended with his great-grandson and *tocayo* (namesake), Moteuczoma "Xocoyotzin." His portrait is the only one that survives today, though it is badly damaged. Nonetheless, its remains allow us to extrapolate some differences between the historical concepts that have been forced on it and its hieroglyphic inscriptions and place in the cosmic landscape. According to Durán, he had his sculptors create his portrait shortly the creation of his greatest monument, identified as

the Calendar Stone, which became enchanted and resisted its fate, presaging the conquest. Uncharacteristic of a divine king, Moteuczoma realizes his mortality and actually weeps before his sculptors when witnessing his portrait. Durán surely minimized Indigenous concepts of body essence and bodily presence, leading to some challenging questions that disrupt his framing of the portrait. Is the central face of the Calendar Stone equivalent of the lost face of the Chapultepec portrait? Did Moteuczoma model for his sculptors? Was physical likeness a central focus of Aztec portraiture, or do the connections of royal body and stone sculpture hinge on greater contexts?

Halcrow, Siân [193] see Miller, Melanie

**Haley, Bryan (Coastal Environments, Inc.)**

[27]

*Ground-penetrating radar Investigations of the Enslaved Community Village at Evergreen Plantation*

A ground-penetrating radar (GPR) survey was conducted at Evergreen Plantation (St. John the Baptist, Louisiana) in the summer of 2021 in conjunction with Florida State University research. The survey focused on the enslaved community village, which includes the surviving cabins, with the goal of delineating additional structures and associated features. The data was used both to generate anomalies for excavation and as a primary dataset to better understand the distribution of features at the site. Several challenges encountered during the GPR survey are typical for the region and included clayey soils and rainy weather. Nevertheless, the GPR data produced a number of anomalies of interest, some of which were revealed through excavation to be intact architecture.

Haffman, Carrin [31] see Sattler, Robert

**Hall, Sarah (Arizona State University), Claudia Rojas-Sepúlveda (Universidad Nacional de Colombia-Sede Bogotá) and Kelly Knudson (Arizona State University)**

[30]

*Migration and Structural Inequality: Lessons from a Historical Skeletal Assemblage from Bogota, Colombia*

[WITHDRAWN]

**Halligan, Jessi (Florida State University)**

[213]

*Karst Talk: Late Pleistocene and Early Holocene Land Use in the Aucilla River Basin of Northwest Florida*

The latest Pleistocene and earliest Holocene (ca. 12,800–8,000 cal BP) is one of the most dynamic eras for the Aucilla River basin of Northwest Florida. During this time, dozens of large and small genera of fauna died out or migrated to new lands, floral biomes completely transformed, and sea levels rose at least 40 m. Ninety-two sites with diagnostic artifact styles thought to date to this period are recorded in the basin, demonstrating that people chose to repeatedly use this landscape when it was a string of semi-adjacent spring runs surrounded by cypress trees in the middle of what was probably an open prairie. Why was this area so important? I hypothesize freshwater and freshwater resources from the few springs flowing during the droughts of the late Pleistocene provided significant places of refuge in an area that also had ample toolstone, albeit chert of variable quality. I will combine recent paleoenvironmental data from the Aucilla basin with site distribution modeling to interpret the archaeological record from these dynamic millennia.

Halligan, Jessi [116] see Graumlich, Emma

Halling, Christine [197] see Seidemann, Ryan

**Halperin, Christina (Université de Montréal)**

[156]

*Empty Spaces: A Tribute to Wendy Ashmore on the Materiality of the Intangible*

Empty spaces are not devoid of people, places, and things, but are inherently relational. As Wendy Ashmore's work on space and place has underscored, empty spaces are perceived and experienced in relation to what is supposed to be there—an anticipation or a memory—and in relation to their contextual settings. This paper examines empty spaces of ancient Maya landscapes and situates them in a broader understanding of those from different time periods and cultural contexts. It explores, in particular, results of recent excavations from the Maya site of Ucanal, Petén, Guatemala, in which empty spaces are implied through the recycled blocks of buildings that were razed and left to the memories of its inhabitants. Although these empty spaces are seemingly the antithesis of "persistent places," they bring to the fore sometimes hidden and more subtle experiences of ancient landscapes.

**Halperin, Christina (Université de Montréal)**

[156]

*Chair*

Halperin, Christina [130] see Le Moine, Jean-Baptiste

Hamdan, Leila [46] see Damour, Melanie

**Hamilton, Andrew (Art Institute of Chicago)****[55]***Tête-à-Tête: The Face-Off between Visuality and Materiality in Royal Inca Representations*

After the Spanish conquest began, Inca artists sought to document their long succession of rulers in royal portraits—many of which survive. Although these drawn and painted images took a number of forms and served in a variety of contexts, they used European court portraiture as their models, seemingly because the Incas did not have an existing tradition of graphically representing their rulers. Even so, these images cannot really be called “portraits” by any European sense of the word; they are merely generic representations of male figures. But European portraits, through the concept of portrait miniatures, shaped the modern notion of miniatures or reduced-scale objects—which the Incas created ubiquitously. Incas formed reduced-scale embodiments of their rulers called *huauques*. Although none survive, colonial sources relate that they were formed by embedding hair and fingernail clippings into a 3D, often aniconic form, thus establishing a direct material connection to their subject. *Huauques* call into question the role of the visual in the supposed “visual arts,” and raise the possibility that they could be considered portraits in a materially founded artistic tradition.

**Hamilton, Cassandra****[98]***Rendering New Insights: An Investigation of Bone Processing Activities at Vale Boi*

The Upper Paleolithic sequence at Vale Boi, Portugal, represents an early example of resource intensification, for which evidence of both diet diversification and intensified utilization of faunal remains has been published. The current research project tests the hypothesis that bone grease rendering was occurring throughout the Upper Paleolithic sequence at Vale Boi. As there are various issues of equifinality which makes the identification of bone grease rendering challenging, data from experimental bone grease rendering studies were utilized. The resulting analysis demonstrated limited evidence in support of a sustained use of bone grease rendering during the Upper Paleolithic sequence. However, evidence suggested that alternate bone processing activities and discard behaviors may have been occurring at the site. This suggests that the dietary behaviors of the foragers at Vale Boi were more varied than previously hypothesized.

**Hamilton, Derek (Scottish Universities Environmental Research Centre), Kerry Sayle (SUERC, University of Glasgow) and Katharine Steinke (University of Edinburgh)****[30]***Inferring Population Mobility in the Past Using Sulfur Isotope Analysis*

The past 10 years have seen an increase in sulfur isotope analysis to investigate the movement and mobility of prehistoric people and animals. While many of the same questions are the focus of studies using strontium and oxygen analyses to investigate human migrations or pastoral economies, sulfur isotopes measured in bone and tooth collagen can provide the opportunity to investigate the movements of individuals throughout their lifetimes. Generally,  $\delta^{34}\text{S}$  values are interpreted as providing residential information relating mainly to coastal proximity, though diet and geology also have an impact on  $\delta^{34}\text{S}$  values. This paper presents a different approach to sampling for sulfur isotopes as applied to both human and animal populations from Middle Iron Age (~400–200 cal BC) sites in Wessex and East Yorkshire, England, and presents insights not only into archaeological questions regarding the movement and mobility of these past populations, but, perhaps more importantly, also insights on how the data are interpreted. Data presented demonstrate that underlying geology strongly influences the final  $\delta^{34}\text{S}$  value in a sample, and as such statistical tools can be used to begin to robustly model the expected prehistoric values for specific geologies that can then be applied to other regions.

**Hamilton, Derek (Scottish Universities Environmental Research Centre)****[30]***Chair***Hamilton, Marcus (University of Texas at San Antonio)****[149]***The Movement Ecology of Hunter-Gatherer Small-Worlds*

As is well-known, mobile hunter-gatherers move to produce, but just as importantly they also move to interact. In this talk I discuss the fundamental interplay of energy, information, and social structure underlying the diversity of hunter-gatherer lifestyles. The differential distribution of resources and people in time and space pose a suite of coordination problems to human foragers. These are largely solved by forming small-world social networks linked by a complex movement ecology. Here, I use scaling theory to develop a formal mathematical model that captures the statistical properties of this complex adaptive system. I then use spatially explicit mixed models to show that the predictions are strongly supported by ethnographic data. The extraordinary efficiency of the human foraging niche emerges from the global consequences of local interactions of people, energy, and information.

Hamilton, Marcus [97] see Kilby, David

Hamilton, Trinity [48] see Lentz, David

Hamlet, Alan [173] see Glowacki, Donna

**Hammerstedt, Scott (University of Oklahoma), Amanda Regnier (University of Oklahoma), Sheila Savage (University of Oklahoma) and Patrick Livingood (University of Oklahoma)****[65]***Reevaluating the Chronology of Spiro and Related Arkansas Valley Mound Sites*

Current research shows that the chronology for Spiro and related sites is based on assumptions that may not be optimal and should therefore be reconsidered. In this poster, we present the results of a pilot study in which we examine artifacts found in secure contexts from WPA and more modern excavations at four sites: Spiro, Harlan, Norman, and Reed. The seriation of these objects may allow us to refine the current chronology.

Hammond, Rebecca [152] see Ryan, Susan

**Hampton, Ashley (University of Montana)****[79]***Residential Units, Hearth-Groups, and Households: Spatial Analysis of Multifloor Assemblage Data within Housepit 54, British Columbia, Canada*

One way to understand household archaeology is to focus on the functional nature of households, exploring what households “do” and the environmentally or economically driven factors that can shift household activities. However, the first step in understanding such household variability is to recognize what spatial signatures are indicative of discrete household-based activities. Though a combination of spatial and statistical analysis, this research highlights ways to determine discrete residential units, or nonspecialized activity areas centered on one or more close hearths, within an occupational floor. Since residential units represent intersecting spheres of activities being performed by individuals defined by their relation to both the location and each other, we then seek to understand how changing use of space may be intertwined with changing social identities. We offer preliminary results of comparisons between hearth-based residential units across multiple occupational floors within Housepit 54 at the Bridge River site, British Columbia. By contextualizing household interactions inclusive of potential socially/culturally constitutive qualities, we can better understand household assemblage variation and change over time.

Hampton, Ashley [83] see Prentiss, Anna

Hanna, Jonathan [19] see Napolitano, Matthew

**Hannigan, Elizabeth (CSU, Chico), Eleni-Anna Prevedorou (American School of Classical Studies at Athens) and Jane Buikstra (Arizona State University)****[226]***How Much Do We Know About Ancient Greek Diets? Stable Isotope Studies from the Early Iron Age to the Classical Period in Attica*

Greece is considered one of the most well-studied regions in the world for paleodietary stable isotope analysis. However, there is a significant lack of stable isotope research on ancient diets for several transformative periods in Greek history, including the Early Iron Age, the Archaic, and the Classical period. In the absence of stable isotope data, archaeologists studying these periods have often focused on epigraphic and mortuary evidence to infer the diets and social organization of ancient Greek people. In 2012, an Archaic period mass grave containing individuals of an unspecified social status were uncovered at the Phaleron site in Athens. This discovery has prompted archaeologists to reexamine the accuracy of textual and mortuary evidence and explore whether stable isotope analysis can support or contest previously held assumptions about the diets and/or social structure of Greek peoples from these transformative periods in Attica. This presentation seeks to (1) synthesize previously reported stable isotope patterns that document dietary and social patterns in Attica from the Early Iron Age to the Classical period, and (2) provide models that will aid contemporary Greek archaeological investigations, like the Phaleron Bioarchaeological Project, in understanding these transformative eras.

**Hannold, Cynthia, Clara Alexander (University of Alabama), Sandra Balanzario Granados (CINAH-QROO) and Alexandre Tokovinine (University of Alabama)****[199]***“Fat one for the priest”: A Comparison of Classic Maya Graffiti from Sealed and Accessible Buildings*

Despite recent in-depth investigations of ancient Maya graffiti, our understanding of the practices that result in the repeated production of painted and incised secondary images and texts on interior walls of elite structures remains limited. These images are often treated as folk art, student practice pieces, game boards, and children’s drawings. One difficulty in the interpretation of ancient Maya graffiti is that many are found on the ultimate construction phases of buildings. It is subsequently difficult to determine whether their production occurred during the initial occupation or peri- and post-abandonment activities. We attempt to resolve this issue by systematically comparing graffiti from sealed Late Classic contexts to those on the ultimate construction phases of buildings at the ancient Maya sites of Holmul and Dzibanché. We adopt an established typological graffiti classification and consider local and site-wide spatial contexts to reveal links between types and themes of graffiti and likely function of the investigated buildings.

Hanratty, Colleen [48] see Guderjan, Thomas

Hanselmann, Frederick [46] see Horrell, Christopher

**Hansen, Daniel (University of Chicago)****[61]***Old Places Made New: Exploring the Local Landscape Context of Reengagement in Northern Pictland*

The landscape of the early medieval period (ca. 400–900 CE) in the northeast of Scotland is marked by signs of engagement with earlier monuments and other prominent landscape modifications from prehistory. The inhabitants of this region, commonly known as Picts, frequently reoccupied earlier settlements, established new constructions in view of prehistoric remains, and inscribed ancient monumental stones with their distinctive symbolic tradition. In Pictland, as in other regions, archaeologists have sought to understand the social entailments of acts of reuse and reoccupation. Some have suggested that such acts served to instrumentalize a deeper past to legitimate new patterns of political power. While such motivations may account in part for the phenomenon itself, little attention has been paid to the effect that Pictish reengagement may have had on understandings of place and its bearing on social life for those who inhabited these landscapes. Drawing on a combination of field observation and GIS-based spatial analysis from northern Pictland, this paper examines the local landscape context of prehistoric materials showing signs of activity in the early medieval period. Sensory and kinesthetic qualities are considered alongside archaeological and historical records in order to explore reengagement within broader landscapes of social experience.

**Hansen, Richard (Idaho State University; FARES Foundation), Edgar Suyuc (FARES Foundation, Mirador Basin Project, Guatemala), Gustavo Martinez (FARES Foundation, Mirador Basin Project, Guatemala), Carlos Morales-Aguilar (University of Texas at Austin) and Enrique Hernandez (University of San Carlos, Guatemala)****[11]***The Dynamics of Statehood and Collapse in the Mirador-Calakmul Basin System*

Archaeological investigations for more than 40 years in the Mirador-Calakmul Karst Basin (MCKB) system by the Mirador Basin Project has revealed the patterns related to the dynamics of the formation of an early Maya state in the Middle Preclassic period and the subsequent demographic collapse of that state by the terminal Late Preclassic period. The links between the origins of states and the demise of the systems are interrelated and methodological research throughout the southern half of the MCKB have allowed hypotheses relevant to the dynamics that may be linked to both the rise and demise of economic, social, and political systems. The multidisciplinary approach involving a number of scientific strategies such as GIS, lidar, excavations, botany, geomorphology, geology, isotopes, and biology have allowed a more comprehensive appraisal of the process of state formation by the early Maya and the flaws and conditions that contributed to the demographic collapse in the Mirador Basin.

**Hanson, Kelsey (University of Arizona)****[152]***Preparatory Acts and Chromatic Spectacle in Chacoan Performance*

The advent of the Chaco World in the northern US Southwest is particularly noteworthy for the expansiveness of its reach, making distant commodities and ideas accessible to a diverse populace through public performances. Performances in historic and contemporary Pueblos involve performers who don elaborately painted costuming to transform themselves into katsina personages. Many ethnohistoric sources indicate that paint imparts animacy in the religious media and costuming used in ritual performances. Making paint requires intimate knowledge of geologic sources, preparation techniques, and cultural protocol. While the archaeological record may be silent on the vibrant details of the performance itself, an archaeological focus on preparatory acts and closure practices is possible. In this paper, I examine archaeological deposits of pigment, paint, paint production tools, and painted media recovered from Chacoan great houses. Using these data, I examine how paint production and deposition practices correspond with changes in the structure of plaza space through time to create eventful histories of performance in the Chaco World.

Hanson, Kelsey [152] see Barvick, Kathleen

Harkness, Rebecca [152] see Barvick, Kathleen

Harkness, Rebecca [175] see Pflieger, Gabriella

Harmansah, Ömür [183] see Johnson, Peri

Harris, Jacob [40] see Coon, Sarah

Harris, Jacob [40] see Keevil, Trevor

Harris, Jacob [90] see Murray, John

**Harris, Katie****[83]***Lithics and the Late Prehistoric: Networks and Interaction on the Southeastern Columbia Plateau*

The people of the Columbia Plateau have been frequently characterized as an homogenous culture despite a 2,500-year time span and a large spatial extent. Moreover, there are significant differences in artifact form, assemblage composition, and household features in Columbia Plateau Culture. The changing natural and social environment can be detected in modifications to their technology, and relationships among distinct Plateau groups can be inferred. The research presented here considers these changes and asks two questions: (1) Can the cultural learning and adaptive strategies of late prehistoric cultural groups be identified in the variability of southern Columbia Plateau projectile points? (2) How does obsidian procurement reflect changing cultural interactions and exchange networks in the southern Columbia Plateau over the past 2,500 years? By using concepts from evolutionary and

social network theories, this study employs obsidian provenience sourcing and the morphometric analysis of projectile points to trace the ways people dealt with these environmental and social pressures through shifting adaptive strategies and increased intergroup interaction.

**Harris, Megan**

[202]

*A Tale of Two Rockshelters: Preliminary Lithic Analysis from Two Rockshelters in the Similkameen Valley, BC*

The Similkameen Valley, British Columbia has long been an area of cultural exchange for Interior Salish (including Sylix and Nlaka'pamux) and Athabaskan (Stuwix) communities. Representing a unique physiographic and ethnographic transitional area between the Columbia and Fraser Plateaus, the Similkameen is characterized as a distinct, nuanced cultural landscape, separate from the two plateaus on either side. This paper presents preliminary results of the lithic analysis from the excavation as a part of the Chuchuwayha Research Project (CRP). As a part of this project, two sites have been excavated to date. Both sites are rockshelters with pictographs. However, the pictograph panels at each site depict different iconography. This paper presents the results of the preliminary lithic analysis from these two sites. Initial data suggests different occupational uses between these two sites.

**Harrison-Buck, Eleanor (University of New Hampshire), Samantha Krause (Texas State University) and Mark Willis (Flinders University)**

[153]

*Human-Wetland Relations in the Lower Belize River Watershed*

The Belize River East Archaeology (BREA) project has identified a range of ancient Maya wetland modifications in northern Belize. Our understanding of the nature and aerial extent of wetland features has improved through more advanced aerial survey and mapping techniques, including satellite imagery, unmanned aerial vehicles, lidar, and other spatial technologies. We discuss results from our recent mapping efforts and our ongoing geoarchaeological testing of these features, which includes geochemical, paleoecological, and chronological results from wetland coring and test excavations in a series of linear canals found throughout the Western Lagoon wetlands. These linear zig-zag canal features extend over 30 km in length, covering a vast area that measures over 40 km<sup>2</sup> or 4,000 ha. We present a comparative study of similar wetland enhancements found in the Amazon, Zambia (Africa), and Australia where a series of canals, ponds, and dams form complex hydrological systems. The ethnographic data from these three areas suggest these features were primarily used for managing seasonal flooding and for trapping fish. This work suggests that in addition to our scientific studies of these coupled human-ecological systems, Indigenous knowledge can greatly enhance our understanding of the nature and complexity of human-wetland relations for the Maya.

Harrison-Buck, Eleanor [172] see Brouwer Burg, Marieka

Harrison-Buck, Eleanor [172] see Haverland, Fiona

Harro, Douglas [24] see Wienhold, Michelle

**Harry, Karen (University of Nevada–Las Vegas)**

[37]

*Discussant*

Harry, Karen [144] see Dougherty, Haley

Hart, John [119] see Lovis, William

**Hart, Siobhan (Skidmore College)**

[58]

*Discussant*

**Hartman, Gideon and Chen Zeigen**

[191]

*Climate Conditions during Human Occupation of the Middle Paleolithic Levantine Site of Neshar-Ramla, Israel: Evidence from Seasonal Isotope Data Measured in Cattle Teeth*

The Middle Paleolithic open air site of Neshar Ramla provides stratified evidence for hominin activity along with exceptionally rich and well-preserved faunal assemblages. The occupational units coincide chronologically with the intriguing Emian climate event (MIS 5e ~130–110 kya). During this period, it was hypothesized that a northward expansion of the “Green Sahara” into the southern Levant, along with summer monsoons, would have created a corridor for human dispersals out of Africa. In this study, we test whether isotopic evidence from Neshar Ramla supports the hypothesized prevalence of summer monsoons. Here we present results of sequentially sampled seasonal isotopic ( $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  values) signals from cattle teeth. Cattle are grazers, are considered a good proxy for meteoric water composition, and are ubiquitous throughout the site occupation levels. If monsoons did prevail in the southern Levant, we would expect evidence for incorporation of C<sub>4</sub> grasses into cattle diet ( $\delta^{13}\text{C}$ ), at least during summer months. These should coincide with anomalously negative  $\delta^{18}\text{O}$  values due to exhausted monsoon cloud systems.

**Harvey, David (PaleoWest) and Ryan Parish (University of Memphis)****[187]***Assessing the Feasibility of Reflectance Spectroscopy Methods to Differentiate Chert Raw Materials in the Hartville Uplift, Southeastern Wyoming*

This paper discusses the results of a pilot project designed to test the efficacy of visible/near-infrared (VNIR) and Fourier-transform infrared (FTIR) spectroscopy at differentiating chert outcrops in the Hartville Uplift of southeastern Wyoming. These methods have shown promise at differentiating inter- and intra-outcrop variability for sourcing purposes in the US Midwest and Southeast. If successful in the Hartville Uplift, we can glean a better understanding of local and regional patterns that have thus far been obscured since assemblages are commonly dominated by local raw materials. Here, we present the first attempt at differentiating various chert outcrops in the Hartville Uplift with non-geochemical techniques. A total of 300 geologic samples from 10 sampling localities were analyzed for this study. We assess the utility of these methods at various scales including an interregional comparison with well-documented quarries in the Plains and midwestern United States and an evaluation of intra-outcrop variability among cherts originating from the Hartville Formation of the Hartville Uplift. This study is the first attempt at developing a regional sourcing program for a heavily utilized lithic landscape that has been studied since the late nineteenth century.

Hasa, Ergys [147] see Schultz, Julian

**Hasbrouck, Tayler and Tyson Hughes (Crow Canyon Archaeological Center)****[190]***From the Landscape to the Living Room: Making Public Archaeology Virtual*

Throughout previous years, Crow Canyon Archaeological Center made the public citizen scientists through in-person programming. However, the onset of COVID-19 tasked us with switching our programs to an online format; from this, the Discover Archaeology webinar series was born. Guided by the principle that there are many ways of knowing the past, these events reflect diverse voices that contribute to our understanding of the past, present, and future. From April 2020 to September of 2021, we hosted over 70 webinars as part of our series; these helped us further our mission impact to a broader audience than ever before. We brought southwestern archaeology into peoples' homes and allowed them to interact with archaeology in a new and exciting way. Programming for school-aged participants shifted to an online model as well. Several educational videos were produced and made available to the public. Crow Canyon was able to work with students through virtual platforms, and educational materials were distributed to participants to augment the online delivery of these programs. Many lessons were learned about translating place-based, hands-on, experiential education into distance learning opportunities.

**Hasenstab, Robert (University of Illinois at Chicago)****[78]***Customized Interpolation of Lidar Data: A Case Study from Casper Bluff, Illinois*

Often lidar data are distributed in pre-processed form, either in raster grid (e.g., TIF image) or vector GIS (contour lines) format. In such cases the spatial resolution is generalized in order to mask any imperfections in the data. Such smoothing loses any detail in the surface data—detail of a scale at which archaeological features may occur (e.g., meter or sub-meter). This paper outlines a workflow by which .las files can be broken out into individual mass points. These x, y, z points can then be processed through customized surface interpolation functions. This project employs ArcGIS Desktop, Ver. 10.6 software. Data from Casper Bluff Reserve, JoDaviess County, Illinois, were processed. Results revealed a suspected thunderbird intaglio feature.

**Hastorf, Christine (University of California, Berkeley)****[87]***Discussant*

Hatcher, Harold [196] see Dillian, Carolyn

**Haury-Artz, Cherie****[52]***Shopping Local: Mammal Procurement Patterns at Joy Creek Major (13PM7), Northwest Iowa*

The large sample of mammal bone recovered from the exposed basal portions of large features at 13PM7 yielded more than 900 identifiable specimens. All of the mammals identified occupy habitats within the geographical range of northwest Iowa. Bison were clearly the primary resource followed by deer, canids, and elk. With the exception of skulls, all anatomical portions of bison are represented in this sample, including low utility elements such as feet and tails. This, coupled with the presence of discarded butchering units such as articulated segments of vertebral columns with associated rib heads indicates a heavy butchering pattern and implies that these animals were killed nearby, and entire carcasses were processed at the site. Hide processing tools were abundant in the assemblage including dozens of awls, fleshing tools, and a hide grainer with embedded pigment. These, along with articulating caudal vertebra, and an assortment of smaller, furbearing mammals suggests that processing of hides and furs was an integral part of village life. Historically these products played a significant role in trade and it they may have been part of Mill Creek regional or extra-regional trade relationships.

**Hauser, Mark (Northwestern University)****[80]***Discussant*

Hauzenberger, Christoph [149] see Brandl, Michael

**Haverland, Fiona (University of Vermont), Marieka Brouwer Burg (University of Vermont) and Eleanor Harrison-Buck (University of New Hampshire)****[172]***Making Sense of Big Data: An Exploratory Geospatial Analysis of Ancient Maya Sites in the Mid-Lower Belize River Valley*

The Belize River East Archaeology (BREA) Project has been investigating ancient Maya settlement in the mid-lower section of the Belize River Valley since 2011. Thousands of GPS points have been collected through field reconnaissance on archaeological material, including over 2,300 previously undocumented mound structures, as well as many other types of data points (e.g., other architectural constructions, artifact scatters, and associated natural features). A geospatial database of this size poses many challenges regarding data management, computing power, and analytical potential. This poster explores fruitful avenues for managing these tasks, and presents an exploratory, multi-pronged settlement pattern analysis of the study area. To gain a deeper understanding of where and why settlements were placed over space and time, how they may have functioned economically and politically, and what interactions were like between the residents of these settlements, we executed a series of proximity and cost surfaces, as well as cluster analyses. We used these analyses to generate hypotheses about settlement contemporaneity and population size. These heuristic analyses will be used as hypotheses against which artifact analyses and further fieldwork can be compared.

**Hawkins, Rebecca (Algonquin Consultants Inc.)****[7]***Discussant*

Hawks, Dustin [114] see Edwards, Briece

**Haws, Jonathan (University of Louisville)****[98]***Discussant*

Hawthorn, Paige [18] see Brownstein, Korey

Hayes-Gilpin, Kelley [113] see Lloyd, Amanda

**Haynes, Gregory****[66]***The Effects of Inundation and Emergence at Pueblo Grande de Nevada: Some Examples from Lake Mead*

Drought and climate change have reduced the pool sizes of many large reservoirs throughout the United States including one of the largest, Lake Mead. This research presents the results of a two-year effort by Lake Mead National Recreation Area and the University of Nevada–Las Vegas, to study the direct and indirect effects of lacustrine-based processes to a large ancestral Puebloan village at Lake Mead, Pueblo Grande de Nevada. Results show that where high-energy lake processes get concentrated habitations and other related archaeological sites are readily degraded or destroyed. Conversely, sites remain intact when they are positioned on flat ground where high-energy wave processes could not be concentrated. In addition, the latter sites are often covered by a protective layer of lakebed sediment that serves to protect the resources during gradual lake recession.

Haynes, Vance [105] see Huckell, Bruce

**He, Yahui (Stanford University)****[185]***Plant Food Exploitation in the Borderland Region of North China during the Early Neolithic Period*

Situated in an ecologically sensitive and fluctuating area, the so-called Northern Zone, today's south-central Inner Mongolia along the Yin Mountains has long been considered as the frontier of Chinese civilization. Here grassland and agricultural land intertwine, entailing the diversity of subsistence strategies as well as sociocultural landscapes, en route to regional societal complexity. Moreover, this region lies at an intersection of cultural interactions, not only connected to the Eurasia steppe farther north and west, but also to the Yinshan Mountains eastward and westward, and even the Loess Plateau to the south. This study is targeted to explore possible plant food processing technology in the boundaries across south-central and Inner Mongolia in China during the early Neolithic period. The early Neolithic cultures in Northern Zone are characterized by the sites of Yumin and Simagou, both located in Huade County, Inner Mongolia. The results from the residue study indicate that different types of tubers, Panicodiaceae, and

Triticeae were the main plants exploited by people during this time period. By revealing microbotanical residues from the artifacts, mainly stone tools at the two sites, this study will help understand local foodways, subsistence strategy, and human-environment relationship in this region during the early Neolithic period.

**He, Yahui (Stanford University)**

**[185]**

*Chair*

**Headrick, Annabeth (University of Denver)**

**[55]**

*Accoutrement Portraiture at Teotihuacan: Whose Portrait Is It Anyway?*

The art of Teotihuacan only occasionally incorporates physiognomy, exhibiting instead faces and bodies that conform to cultural prototypes, largely indistinguishable from one another. It is in the additive elements, clothing, costume, and surrounding adornments, that aspects of portraiture emerge. This paper will focus on the Teotihuacan censer tradition, viewing them as elaborate constructed portraits with an intent to convey a sense of individual identity and social standing. While the main thrust will be Teotihuacan's censers, human depictions in murals, stone sculpture and on ceramics will also inform this discussion. Central to this paper will be the question of patronage and how the intersection of patron and the depicted impacts the very question of portraiture. In this case, the agency of the depicted may have been undermined or co-opted by larger social forces.

**Headrick, Annabeth (University of Denver)**

**[55]**

*Chair*

Healan, Dan [18] see Ward, Timothy

Heath, Barbara [203] see Burge, Keri

**Heath-Stout, Laura (University of Massachusetts, Boston)**

**[100]**

*Moderator*

**[148]**

*Discussant*

Hebert, Kirsten [81] see Whitney, Kristina

Hebley, Jennifer [18] see Adams, Betty

Heckert, Megan [127] see Wholey, Heather

**Heckman, Jasmine (US Army Corps of Engineers) and S. Terry Childs (US Department of the Interior, Retired)**

**[81]**

*The Curation Crisis: Employing Innovative Solutions*

In the 1940s, federal agencies began large-scale construction projects that produced archaeological collections with both short and long-term scientific value to the agency, curatorial institution, and the nation. These efforts, as well as the enactment of federal preservation laws in the 1960s and 70s, generated a backlog of archaeological collections that were processed to varying non-uniform standards and degrees and often not properly curated. These and many other factors contributed to the curation crisis faced in our discipline for decades. Federal agencies have developed and implemented both local and national approaches to manage these important cultural resources. This paper explores the curation crisis and presents innovative and unique solutions that have been used to address the curation crisis in the federal government. These include agencies working together on collections projects, consolidating archaeological collections into federally compliant regional centers, coupling veterans in need of transferrable job skills with archaeological laboratory work, efforts to preserve born digital collections, creating standardized cataloging databases, and using creative mitigation related to Section 106 projects.

**Heckman, Jasmine (US Army Corps of Engineers)**

**[81]**

*Chair*

Heckman, Jasmine [81] see Joseph, J.

**Hedgpeath Balkin, Jessica (University of Colorado Boulder), Arthur Joyce (University of Colorado Boulder) and Michelle Goman (Sonoma State University)****[154]***Mangrove Landscapes in the Lower Río Verde Valley, Oaxaca, Mexico: Growth and Role in Daily Life*

The role of mangrove landscapes in prehispanic human-environment interactions in the lower Río Verde Valley of coastal Oaxaca shifted diachronically due to environmental changes. Paleoenvironmental data indicate that during the Late/Terminal Formative (400 BCE–CE 250), a bay barrier developed, which resulted in estuary formation. Somewhat protected from the sea, mangroves expanded, thriving on the fringes of calmer waters. We draw on interdisciplinary research to discuss shifts in the extent of mangrove landscapes and human interactions with them. Settlement and land use studies indicate that while occupation near mangrove wetlands peaked shortly after the bay barrier formed (ca. CE 250), population in the area was relatively low. Dietary data corroborate these findings; lower Verde populations focused on agricultural resources grown outside of mangrove landscapes. Nevertheless, estuarine resources—including mollusks which live on mangrove roots—were exploited and probably provided a nutritional boost to the prehispanic diet via protein and other nutrients. Mangrove landscapes were also valued beyond their dietary contributions; lower Verde peoples extracted resources such as salt and possibly shell, circulating them in long-distance trade networks. Overall, a small proportion of the lower Verde population likely interacted with mangrove landscapes directly—via select residential sites or temporary extraction camps.

**Heilen, Michael (Statistical Research Inc.) and Shelby Manney (Arizona Army National Guard)****[66]***Integrating Cultural and Natural Resource Management in Arizona: A Case Study*

In complying with legal mandates, cultural resource management in the United States focuses narrowly on the consideration of archaeological sites and historic buildings, structures, and districts. Native American Tribes typically do not separate nature from culture, however. Plants, animals, habitats, minerals, water sources, and landforms often play important roles in Native American traditions and cultural history. Native American Tribes routinely identify natural resources as being of concern when consulting on the mitigation of adverse effects to cultural resources and identify important relationships among natural resources, archaeological sites, and living landscapes. Moreover, federal agencies increasingly recognize the need to integrate cultural and natural resource management to achieve better conservation and preservation outcomes. Methods and approaches for integrating cultural and natural resource management are under-developed, however. For example, what kinds of data and methods are needed for integration and how should they be developed, organized, and implemented? Arizona Army National Guard (AANG) consults with 33 Native American Tribes in the management of cultural and natural resources located throughout Arizona. In this presentation, the AANG's efforts to develop new perspectives, tools, and methods for integrating cultural and natural resource management are explored and discussed.

Heilen, Michael [197] see Manney, Shelby

**Heller, Eric (University of Southern California)****[188]***From Landscapes to Virtualscapes: The Legacy of Wendy Ashmore in the Digital Age*

Wendy Ashmore, a pioneer in social landscape archaeology, conceptualized landscapes as actively inhabited spaces recursively linked with human action and ideation. Landscapes are embodiments of humanity's practical concerns as well as our more intangible notions related to cosmology, ideology, and social structure. Through rigorous attention to experiential and performative features of ancient landscapes, Ashmore provides pathways to insights into these more ephemeral concerns. Presently, our ability to replicate aspects of ancient human experiences through digital technologies is unprecedented. Photogrammetry and virtual reality visualizations offer the means to digitally replicate limited aspects of embodied experiences, through our own augmented senses. In this paper, I explore opportunities afforded by these emergent technologies through the lens of my own studies which, like Ashmore before me, is attentive to the relationships between space, embodied experience, social relations, and ideation. I highlight the potential to reach new audiences, establish novel avenues of collaboration with Indigenous communities and other stakeholders, render landscapes as the accumulations of human "decisions and dispositions," and better understand these essential agentive transmitters of social meaning across generations. Ultimately, I explore my own way of extending Ashmore's vision and legacy into new horizons of digital archaeological research.

**Helmer, Elliot (Washington State University) and Cassandra Rippee (Coquille Indian Tribe)****[131]***Procurement as Placemaking and Kinship: Tracing Human-Shellfish Relationships at the Vesta Shell Midden, Bandon, OR*

Collaborative approaches to archaeology have led to an increasing emphasis on theories based in Indigenous Studies, especially those which emphasize the importance of local, land-based ontologies in developing research questions and guiding interpretations. Drawing from these approaches and specifically integrating lessons from Coquille ontology and oral history, this study views the practices of shellfish harvesting and management through the lens of kinship relations. Local kinship systems emphasize reciprocity and autonomy and from this, we hypothesize that relationships with the land will take on similarly non-hierarchical forms. Implications of such relationships includes: flexible procurement strategies; horizontal management practices; and a holistic approach to intertidal resources that considers preexisting ecological/social relations between these nonhuman persons when making harvesting decisions. Furthermore, the role of shellfish and other intertidal species as kin is reaffirmed through their integration into shell middens, which signal ancestral connections to place for generations in both the past and present.

**Helmer, Elliot (Washington State University)****[131]***Chair*

**Helmer, Matthew (US Forest Service)****[211]***Discussant*

Helmke, Christophe [172] see Watkins, Tia

**Hendon, Julia (Gettysburg College)****[188]***Settlement, Households, and Landscapes: Wendy Ashmore and Maya Archaeology*

This paper traces Wendy Ashmore's contributions to settlement pattern studies, household archaeology, and the archaeology of landscapes. Such a retrospective look at this aspect of Wendy's research and writing is appropriate in the context of this session which proposes a wide ranging consideration of her contributions in order to understand her personal and intellectual impact on Mesoamerican archaeology. In this paper, I consider how Wendy's work on settlement, households, and landscapes encouraged a more expansive understanding of human-environment relationships. This understanding made it possible to consider the ways that people create and modify the natural, social, political, economic, and spiritual worlds that they inhabit. The ways that people gave meaning to the places that they built and the landscapes that they moved through are an important part of Wendy's contributions as is her use of heterarchy as an analytical framework.

**Hendrickson, Mitch (University of Illinois at Chicago), Christian Fischer (Independent), Julia Estève (EFEO), Dominique Soutif (EFEO) and Cristina Castillo (University College, London)****[181]***The Second City of Angkor: Investigating Urbanism, Buddhism, and Technological Practices at Preah Khan of Kompong Svay, Cambodia (Eleventh to Thirteenth Century CE)*

Preah Khan of Kompong Svay (PKKS), the single largest settlement complex built during the Angkor period, is one the most important yet enigmatic sites in Cambodia. The architectural core of this "Second City" of the Khmer Empire was repeatedly remodeled by Angkor's major kings between the eleventh and thirteenth centuries and served as an outpost of Angkorian influence to gain access to the vast iron reserves around Phnom Dek, the "Iron Mountain." Unlike the Hindu dedication of most Khmer temples, PKKS was dedicated to Buddhism and was known from inscriptions as a major religious center in the Angkorian world. The Two Buddhist Towers Project employed a multiscale approach combining architectural, epigraphic, archaeobotanical, metallurgical and remote sensing sources to reconstruct the occupational, religious, and technological histories of PKKS and understand its role in the rise and expansion of the Khmer Empire. This paper summarizes the results of the first two seasons of work at this unique site.

Hendrickson, Mitch [181] see Leroy, Stéphanie

Hendrix, Karen [111] see Vianello, Andrea

**Hernandez, Christopher (Loyola University Chicago)****[130]***Uneven Landscapes: Terrain, Architecture, and Inequality at Tzunun, Chiapas, Mexico*

The study of inequality has been a mainstay of archaeology with a diversity of scholars examining patterns in the distribution of artifacts and architecture to understand past socioeconomic differences. Over time, researchers have come to emphasize the tangible indicators of inequality that shape landscapes and everyday lived experience. In this paper, I examine artifact distributions, architecture, and terrain at the site of Tzunun, Chiapas, Mexico, to understand how inequality was shaped through practice and embodied with the local landscape. I argue that the ancient inhabitants of Tzunun incorporated their environment to create layer upon layer of defense that in turn promoted social inequality. Within a heavily guarded settlement, elites occupied the highest and most well defended terrain, while exposing the rest of the population to greater levels of violence. These differing levels of protection inscribed inequality on the landscape, and perpetuated it across generations.

Hernández, Daniel [85] see Flores-Fernandez, Carola

Hernandez, Enrique [11] see Hansen, Richard

Hernandez, Priscilla [85] see Mathwich, Nicole

**Hernandez-Bolio, Gloria (CINVESTAV Unidad Merida), Patricia Quintana (CINVESTAV Unidad Merida), Michele Morgan (Peabody Museum of Archaeology and Ethnology), Andrew Scherer (Brown University) and Vera Tiesler (Universidad Autónoma de Yucatán)**

[209]

*A Secret behind Dental Decoration of Ancient Maya: Organic Compositional Studies of Tooth Seals and Fillings*

One of the unsolved mysteries about the elegant and refined Maya practice of dental inlaying is the nature of the cement, possessing qualities that endured the harsh buccal environment and ensured the fastening of the inlay even after centuries of postmortem conservation. It is also possible that the components of this material contributed to low caries rates and low incidences of other pathosis. So far, only inorganic studies had been performed on dental sealings, revealing hydroxyapatite and Portland cement-related compounds. However, the nature of the agglutinant giving resistance to this powder is still unknown. The aim of this work was to investigate the organic fraction of tooth seals and fillings in samples from Maya cities Holmul (Guatemala), Baking Pot (Belize), and Copan (Honduras) and its surrounding settlements. The analysis by means of attenuated total reflectance infrared spectroscopy and gas chromatography coupled to mass spectrometry revealed some differences in their composition according to the archaeological site, allowing the proposal of a formulation for the manufacture of these materials. In addition, the ingredients found in the mixtures validate the antibacterial and anti-inflammatory properties of the sealings, thus highlighting the expertise of the Maya and its successful application in the dental practice.

**Hernandez-de-Lara, Odlanyer (Syracuse University) and Esteban Grau González-Quevedo (Fundación Antonio Nuñez Jiménez de la Naturaleza y el Hombre)**

[44]

*Bunkers and Trenches from the Cold War: Documenting a Forgotten Heritage from the Cuban Missile Crisis (1962)*

The Cold War was one of the main conflictive scenarios in a global scale from the twentieth century. In that context, 1962 became the more complex year in the relations between the Union of Soviet Socialist Republics (USSR) and the United States of America (USA) when long-range nuclear missiles that presented a high risk for the American national security were detected along several hidden military bases in Cuba. This event, named the Missile Crisis or October Crisis, has been investigated from different perspectives, including archaeology in the last decade. The very diverse associated materiality is distributed across the whole island of Cuba as a result of the militarization of the territory during the period. In this case, we present the first insights about the documentation using 3D videogrammetry of bunkers and trenches that constituted part of the coastal defensive positions of the bay of Matanzas, in western Cuba. The impact of significant coastal erosion in the area forces prioritization of the documentation and investigation of local heritage with global significance.

**Hernandez-de-Lara, Odlanyer (Syracuse University)**

[44]

*Chair*

Hernández Estrada, Raquel [131] see Ainis, Amira

**Hernández Garavito, Carla (University of California, Santa Cruz)**

[82]

*Local Reinventions of Imperial Landscapes in Huarochirí (Peru)*

The successive waves of colonialism in the Central Andes by the Inka and Spanish Empires were grounded on broadscale transformations of the built and natural landscape as a means to “create” ideal subjects that lived in a pattern that could be considered “civilized” by either empire. For the Inka, this project was the Tawantinsuyu, connected through roads and administrative centers but embedded in mythical narratives of huaca lineages and ritual practices. For the Spanish, this project was the Reducción General de Indios and the massive resettlement of Indigenous bodies into Spanish-like towns where control and evangelization could be jointly achieved. Nevertheless, the “top-down” spatial programs spearheaded by both Inka and Spanish met with “bottom-up” transformations rooted in the experiences, traditions, and practices of the local communities they subjected. In this presentation, I use archaeological and archival research to provide a preliminary assessment of how idealized Inka and Spanish “imperial landscapes” in the Peruvian highland region of Huarochirí were locally reinvented through movement, embodied experience, and local history. I look at interventions in architecture, ceramic distribution networks, and site emplacement to show how local communities in Huarochirí created new forms of identities that endured these colonial programs.

**Hernández Garavito, Carla (University of California, Santa Cruz)**

[189]

*Discussant*

Hernández Garavito, Carla [87] see Kosiba, Steve

Hernández Garavito, Carla [92] see Milon, Joshua

Hernandez Godoy, Silvia [19] see Chinique de Armas, Yadira

**Herr, Sarah (Desert Archaeology Inc.)**

[37]

*Discussant*

**Herrero Corral, Ana (University Complutense de Madrid, Spain)****[17]***From Childhood to Adulthood in Iberia during the Bell Beaker Period*

One of the central questions raised when approaching the role of non-adult individuals in prehistory is knowing at what age were they already considered as adults. If only biological factors are contemplated, this transition could occur either at the beginning of puberty (around 12–13 years) or at the end of the adolescence when the skeleton does not show any sign of immaturity (around 19–21 years). It is known, however, that age categories are socially constructed, changing from one community to another and that both biological and cultural variables must be integrated to detect the eventual rites of passage. These traces are particularly visible in the funerary record where tombs, through a specific funerary treatment, reflect age categories from the world of the living. These characteristics are especially noticeable in Bell Beaker graves in which funerary patterns are quite standardized. This study addresses how the analysis of non-adult graves with Bell Beaker elements of the Iberian Peninsula appears to be a powerful tool to approach the rites of passage of those communities. In particular, it is possible to explore the critical period of adolescence and to detect the passage into adulthood through the analysis of funerary structures and grave goods.

**Herrmann, Corey (Yale University)****[84]***The Local without Walls: Reflecting on Borderlands in the Cordillera Costanera de Chone, Manabí, Ecuador*

Ecuadorian coastal archaeology has been cleaved in two. To the south archaeologists traditionally follow the trajectories of Bahía, Guangala, Manteño, and Guancavilca; to the north, Jama-Coaque and La Tolita; all are commonly interpreted to share the “Formative” Chorrera tradition as a *cultura madre*. The Bahía de Caraquez and the Río Chone is typically taken as a mutually agreed-upon border. This situation is mirrored macroregionally by traditional interpretations of culture-historical archaeology, which never settled on where precolumbian and ethnographically encountered societies of coastal Ecuador fit within their co-tradition and culture area frameworks, nor where such a border between said culture areas could have existed. The Proyecto Arqueológico Río Grande de Chone (PARGC) has taken this supposed “no-man’s land” as its geographic focus in north-central Manabí. The PARGC aims to illuminate the history and archaeology of the peoples that have inhabited this supposedly liminal stretch of the cordillera costanera for at least four millennia, with special attention to stochastic volcanic eruptions in the neighboring highlands and their contingent impacts on social organization through time. This paper, contextualized by PARGC’s encounters and excavations alongside the comunas of Achiote and Platanales, reflects on the social constructions of borderlands, marginality, and emergent landscapes of resistance.

**Herrmann, Jason****[137]***Moderator*

Herrmann, Nicholas [166] see Bowden, Taylor

**Herron, Molly (University of Wyoming) and Kenneth Hladek (University of Wyoming)****[20]***On the Tundra: An Archaeological Perspective of the Bering Land Bridge National Preserve, Alaska*

Beringia is one of the most widely discussed and contested regions in North American archaeology. For most researchers, the term Beringia is synonymous with a rough and frozen tundra, hardly habitable and featuring an extreme dearth of resources. However, was this environment truly so unforgiving? To begin to answer this question, the authors embarked on an eight-day backpacking trip in the Bering Land Bridge National Preserve, Alaska. This immersive experimental approach to landscape archaeology allowed us to experience the challenges and opportunities this environment offers, albeit at least 14,000 years after the first colonizers crossed this same patch of land. The dichotomy of this paraglacial landscape lies in the abundant floral, faunal, and freshwater resources, which contrast with the difficulty of rapid mobility across an environment in active deglaciation. Despite predatory threats, unpredictable weather, and often compromising terrain, the availability of prey, freshwater, and mass biodiversity of edible and medicinal plants makes this vast environment profitable to a knowledgeable population.

Herron, Molly [116] see Doering, Briana

Hershkovitz, Israel [191] see May, Hila

Hershkovitz, Israel [191] see Mercier, Norbert

Hidgins, Gregory [105] see Huckell, Bruce

**Hildebrand, Elisabeth (Stony Brook University)****[6]***Moderator*

Hildebrand, Elisabeth [90] see Kelsey, Brady

Hildebrand, Elisabeth [90] see Kracht, Olivia

Hildebrand, Elisabeth [76] see Taffere, Abebe

Hildebrand, Elisabeth [90] see Wilson, Evan

Hill, Austin Chad [126] see McCoy, Mark

**Hill, Cameron (Wichita State University) and Laurence Dumouchel (Wichita State University)**  
[20]

*Actualistic Study of Puma (Puma concolor) Bone Surface Modification on Cow (Bos taurus) Remains*

This actualistic study focuses on the bone surface modification patterns created by pumas (*Puma concolor*) on the bones of the animals they eat. The bones assessed in our study were modified by captive pumas from the Exotic Feline Rescue Center in Center Point, Indiana. The assemblage consists of 203 cow (*Bos taurus*) specimens. We analyzed each element by bone part, then identified the types of tooth marks—pits, punctures, scores, and furrows—and the damage level on a scale of 0–4. We found that scores were the most prevalent type of mark (37% of total marks), followed by pits. The ribs had the most scores and highest damage level on average. The majority of damage took place on the epiphyses of long bones, especially around large joints such as the proximal humerus and femur, which is consistent with findings from previous studies. The information gathered in this actualistic study can help shed light on the puma tooth mark evidence from North and South America, where this carnivore occurs. It can also provide comparisons useful to interpret zooarchaeological and paleoecological assemblages.

Hill, David [144] see Cooper, Zachary

Hill, Kristina [66] see Bodenstein, Nicole

**Hill, Matthew E. (University of Iowa) and Erik Otárola-Castillo (Purdue University)**  
[16]

*Was There a Broad-Spectrum Revolution among the North American Great Plains Hunters?*

Archaeologists sometimes portray the 15,000-yearlong hunting record left by North American Great Plains people as depicting an almost exclusive reliance on large-bodied prey, such as bison. However, this simplified perspective ignores temporal and spatial variability in environmental conditions, including native economies encompassing hunting and gathering, horticulture, and eventually agriculture. We employ a large dataset of faunal remains from more than 500 archaeological sites to refine the accuracy of long-term dietary patterns in the Great Plains and investigate the broad patterns of specialization and diversification of faunal use among Great Plains Indigenous people through time. Our findings suggest that even though prehistoric Indigenous people of the Great Plains maintained a way of life associated with bison over time, bison was not the sole focus nor the dominant species in their diet. In addition, we observe that hunting strategies and dietary variation through time does not support a model of progressive resource intensification from hunting and gathering to farming. Instead, Great Plains Indigenous hunters exploited a variable set of faunal resources contingent on their environmental and socio-demographic settings.

Hill, Matthew E. [40] see Otárola-Castillo, Erik

Hill, Matthew E. [108] see Soares, Justin

Hill, Matthew E. [68] see Thomas, Ariane

**Hill, Matthew G. (Iowa State University) and Thomas Loebel (Illinois State Archaeological Survey)**  
[97]

*Technological Association of Stag-Moose and Paleoindians in the Midcontinent*

Ethnographic patterns and microwear studies suggest Paleoindian perishable technology in the Midcontinent was complex and diverse, and the toolkit included items made on bone, antler, and wood. Telltale remnants of grooving-and-snapping on a section of stag-moose antler dating to 10,120 BP from west-central Iowa confirm Paleoindian use of stag-moose antler as toolstock. The artifact is interpreted to be an exhausted antler core from which multiple tines were detached before discard. It also represents the first confirmed association of this extinct animal with people in North America.

Hill, Matthew G. [38] see Chapman, Larkin

Hill, Matthew G. [97] see Loebel, Thomas

Hillman, Aubrey [88] see Vining, Benjamin

**Hipp, Amalie (Colorado College)**  
[197]

*D&RGW R.R. South Fork "Waiting House" Passenger Shed: Colorado State Register of Historic Properties Eligibility Assessment*

The Denver and Rio Grande Western Railroad (D&RGW) prompted the building of shed and depot structures along the Creede Branch in the San Luis Valley. South Fork, Colorado, contains a remaining wooden structure colloquially known as the "Waiting House," relocated to private property from its spot along the tracks parallel to the Rio Grande. Current Colorado State Register of Historic Properties and National Register of History Properties (NRHP) inventories lack comprehensive descriptions of vernacular-style railroad structures. This presentation outlines the nomination process of the D&RGW "Waiting House" to the Colorado State Register. Archival research into the "Waiting House" shed types and the graffiti of names and dates along its interior aided in registration recommendations. The process highlights the need for nominations of Colorado railroad structures in the NHRP to adopt a new passenger shed type to the typologies accepted in nomination forms.

**Hiquet, Julien (CNRS UMR Archéologie des Amériques), Philippe Nondédéo (CNRS UMR 8096 Archéologie des Amériques) and Carlos Morales-Aguilar (University of Texas at Austin)**

[11]

*The Rise of Naachtun (Petén, Guatemala): Shifts and Continuities between the Late Preclassic and Early Classic Periods*

Recent archaeological investigations at Naachtun in northern Guatemala led us to document its emergence and rise during the transition period between AD 150 and 300. Contrary to the findings of their neighbor site of El Mirador during this span, the Preclassic hamlet of Naachtun turned into a major capital during the Classic period. This paper gathers data on urban population growth, settlement patterns, monumental architecture, ceramics, and clues on the presence of kingship to characterize the city's growth. According to the long-accepted chronology of the Maya lowlands, the early rise of Naachtun before AD 300 would be classified as Preclassic. However, we consider that the Naachtun data well support the idea of an initial Early Classic phase starting around AD 150 after the demise of the El Mirador. These dynamics are compared to the trajectory of the closest primary contemporary site: Kunal. Their sequences could be complementary: as is the case in other Petén sites, it is possible that a population movement and political transfer occurred between both sites during the Late Preclassic and the Early Classic, nourishing the growth of Naachtun.

Hiquet, Julien [53] see Begel, Johann

**Hirai, Nina (Wesleyan University), Zhipeng Li (Chinese Academy of Social Sciences), Songmei Hu (Shaanxi Provincial Institute of Archaeology), Rowan Flad (Harvard University) and Katherine Brunson (Wesleyan University)**

[158]

*Archaeological Open Access Data: A Comparative Analysis of Oracle Bone Production and Use in Ancient China*

Open-access databases serve a multitude of purposes in the field of archaeology. In this poster, we utilize open access data from the online Oracle Bones in East Asia (OBEA) project on Open Context to compare patterns in oracle bone production and use. We also consider possibilities for applying data visualization tools and open access resources in educational and outreach endeavors in order to increase accessibility of the OBEA project and the study of East Asian archaeology.

**Hirniak, Jayde (Arizona State University), John Murray (Arizona State University) and Andrew Zipkin (Arizona State University)**

[39]

*Developing an Empirical Calibration for Elemental Characterization and Sourcing of South African Silcrete with pXRF*

Geochemical provenience studies of toolstone provide archaeologists with a vehicle for reconstruction of the social networks, mobility patterns, and possibly exchange networks of ancient human populations. However, sourcing stone artifacts can be problematic because methods are often destructive and can damage artifacts. Additionally, many instruments are not readily available in the countries where archaeologists work, necessitating the export of artifacts for analysis. Therefore, this research project aims to address these issues for silcrete, a significant class of toolstone in multiple regions, by developing an empirical calibration for portable X-ray fluorescence (pXRF) analysis. pXRF is a nondestructive and field-portable technique for measuring the elemental composition of a material. To effectively use pXRF to source raw materials, the calibration settings must be optimized for the target material. Currently, there is no empirical calibration for silcrete rock from South Africa. To create this calibration, an experimental reference collection of geochemical compositions will be developed from three sources of silcrete in South Africa that have been analyzed with solution inductively coupled plasma-mass spectrometry. The results of this project will provide archaeologists with an empirical silcrete calibration for accurately characterizing and potentially sourcing silcrete artifacts using an approach that is nondestructive, portable, and relatively inexpensive.

Hirschi, Jaynie [24] see Duke, Daron

Hirth, Kenneth [76] see Dussol, Lydie

**Hiscock, Peter**

[83]

*Lithic Raw Materials and Morphological Variation, a Small Example*

Microliths are often thought to be parts of standardized hunting weapons, but in Australia there is evidence that they were used in craft production of organic tools and paraphernalia. It is argued that these tools also operate to send public signals and that this accounts for their standardization. But how standardized are they? How were quite different raw materials used to manufacture microliths with the same dimensions? In this paper I use geometric morphometrics to study these questions on a large sample of microliths from a desert region. The results shed light on the ways microlithic technologies were organized.

Hiscock, Peter [120] see Tabrett, Amy

**Hixon, Sean (Max Planck Institute for the Science of Human History), Kristina Douglass (Pennsylvania State University), Laurie Godfrey (University of Massachusetts, Amherst), Laurie Eccles (Pennsylvania State University) and Douglas Kennett (University of California, Santa Barbara)**

[120]

*Ecological Consequences of a Millennium of Dogs on Madagascar*

Introduced predators currently threaten endemic animals on Madagascar through predation, facilitation of human-led hunts, competition, and disease transmission, but the antiquity and past consequences of these introductions are poorly known. We use directly radiocarbon dated bones of introduced dogs (*Canis familiaris*) to test whether dogs could have aided human-led hunts of the island's extinct megafauna. We compare carbon and nitrogen isotope data from the bone collagen of dogs and endemic "fosa" (*Cryptoprocta* spp.) in central and southwestern Madagascar to test for competition between introduced and endemic predators. The distinct isotopic niches of dogs and fosa suggest that any past antagonistic relationship between these predators did not follow from predation or competition for shared prey. Radiocarbon dates confirm that dogs have been present on Madagascar for over a millennium and suggest that they at least briefly co-occurred with the island's extinct megafauna. Dogs on Madagascar have had a wide range of diets during the past millennium, but relatively high stable carbon isotope values suggest few individuals relied primarily on forest bushmeat. Our newly generated data suggest that dogs were part of a suite of animal introductions beginning over a millennium ago that coincided with widespread landscape transformation and megafaunal extinction.

**Hladek, Kenneth (University of Wyoming)**

[76]

*Hearth Feature Oxidation: A Proxy for Time and Temperature?*

The oxidation of hearth features is a phenomenon not well understood in modern archaeology. Assumptions prevail about oxidized features recorded during excavations; somewhat vague and ambiguous conclusions follow. Oxidation is commonly understood in archaeology to represent extensive burn times at high temperatures. Modern experimental archaeology has contributed significantly to our understanding and interpretation of prehistoric hearth features. However, the oxidation of sediments associated with these experiments often occurs very quickly. This experiment-based research shows oxidation starts rapidly at low temperatures with a positive correlation between the color of oxidized sediment, quantified using a colorimeter, and the time of exposure at a given temperature. Oxidation is a proxy for the time and temperature a fire has burned, but a new standard for quantifying heat-induced oxidation is necessary for a complete and accurate interpretation of an in situ hearth.

Hladek, Kenneth [20] see Herron, Molly

**Hoag, Elizabeth (Cleveland Institute of Art)**

[196]

*Public Archaeology and Engagement in Shaker Heights, Ohio: Past, Present, and Future*

Since 2015 the Shaker Historical Society in Shaker Heights, Ohio, has been sponsoring community-based archaeological day-camp experiences and activities for school-aged children. Through excavations at local historical sites within the city and simulated sites at the Shaker Historical Society, the participants of our program have learned the importance of archaeology, history, and preservation in their own communities, making them better stewards and advocates for the past. In this paper I detail how the program managed to weather a pandemic while continuing to further the mission of the Shaker Historical Society to "inspire people to engage in and celebrate the Shaker Heights story and its impact on the region . . . past, present, and future," and to position ourselves to continue to grow our program and outreach.

Hockaday, William [115] see Kidwell, Jasmine

**Hodapp, Magen, Genna Barela (Northern Arizona University) and Chrissina Burke (Northern Arizona University)**

[20]

*The Taphonomic Effects of Chemically Enriched Fertilizer on Animal Bone*

Farming and gardening are an imperative part of modern lifeways, and fertilizer is a common tool used to improve the yield of each. It can be assumed that bone buried underground will be altered by the use of modern fertilizer; however, limited research has been conducted on the taphonomic effects of the chemicals nitrogen, phosphorus, and potassium within fertilizer on bone. Previous research has demonstrated the effects of naturally acidic soil to bone, exemplifying the way bone matter corrodes within this environment. In addition, there is a significant amount of bone mass that degrades as a result of the chemical compounds in the fertilizer. Depending on the NPK, or nitrogen-phosphorus-potassium ratio, of the fertilizer, pH levels may be much higher than that of naturally acidic soil. This research project evaluates the effects of varying chemical composition fertilizers to bone buried within the earth. Using several brands of fertilizer combined with soil, animal bone was placed within identical sized jars and left over several weeks to mimic a farming environment, in which the earth would not be disturbed for a long period of time. The different chemical ratios in each fertilizer results in differing amounts of corrosion and lost bone.

Hodapp, Magen [20] see Beller, Jason

Hodge, Katherine [146] see Piscitelli, Matthew

Hodgetts, Lisa [140] see Goodwin, Rebecca

**Hodgskiss, Tammy (Origins Centre, Faculty of Science, Wits University), Jasmin Culey (University of the Witwatersrand), Sarah Wurz (University of the Witwatersrand), Paloma de la Peña (University of the Witwatersrand) and Aurore Val (Universität Tübingen)**

**[155]**

*Early Ochre Pathways: Ochre Procurement and Use 150,000 Years Ago at Olieboomspoor, Limpopo, South Africa*

The regular use of ochre from ~100 000 years ago by early modern humans in southern Africa coincides with important innovations in material culture. These include complex stone and bone tool technologies, extensive exploitation of plant and animal resources, and the use of symbolic or decorative items. Olieboomspoor Shelter (OBP) in the Waterberg, Limpopo Province, South Africa, yields a large ochre assemblage from Middle Stone Age (MSA) contexts, with lower MSA deposits dating to  $150 \pm 14$  ka ( $1\sigma$ ). The ochre assemblage is largely composed of heavy, shiny specularite nodules, many of which have no signs of use. This varies from the ochre assemblages of significant MSA sites such as Blombos Cave and Sibudu along the coast of the country. Research into why and how these visually striking, and versatile, earth pigments were used in the deep past is valuable in interpreting not only the cognitive capabilities of its users, but also for its potential to shed light on the emergence of cultural and social behavior in the deep past. Here, we consider ochre procurement and use strategies at OBP to better understand how early modern humans used and experienced ochre at the site and in the broader cultural landscape.

**Hoffecker, John (INSTAAR)**

**[112]**

*Discussant*

Hoffman, Madeleine [66] see Bledsoe, Jacob

Hoffmann, Tanja [141] see Lyons, Natasha

**Hofman, Corinne (Leiden University)**

**[19]**

*Discussant*

Hofman, Corinne [19] see Schroeder, Hannes

Hofman, Corinne [166] see Shev, Gene

**Hoggarth, Julie (Baylor University)**

**[21]**

*Impacts of the COVID-19 Pandemic on Women and Early Career Archaeologists*

The COVID-19 pandemic has had far-reaching impacts in all segments of life worldwide. While a variety of surveys have assessed the impacts of the pandemic in other fields, few studies have focused on understanding the impacts of the pandemic for archaeology. To assess these trends, we asked survey respondents ( $n = 570$ ) if they experienced job loss and to rate the percentage of change in their economic situation, workload, teaching or research activities, and personal responsibilities. Results show alarming trends, with nearly half of those who experienced job loss being under the age of 35 and women and early career archaeologists suffering major economic losses. Impacts to workload, teaching activities, and research activities were also felt across these groups. Substantial increases in personal responsibilities (childcare, eldercare, caring for sick family members) were also identified, especially for women with children under 18 years of age. While structural inequalities have already been identified across different sectors of archaeology, the results of this survey suggest the most vulnerable populations are those most heavily affected. We recommend a variety of strategies for employers, professional organizations, funding agencies, and publishers to consider in mitigating the consequences of COVID-19, especially for women and early career scholars.

Hoggarth, Julie [218] see Ebert, Claire

Hoggarth, Julie [157] see Freiwald, Carolyn

Hoggarth, Julie [96] see Roa, Ian

Hoggarth, Julie [54] see Walden, John

**Holcomb, Justin (Kansas Geological Survey, University of Kansas), Beth O'Leary (New Mexico State University), Ann Garrison Darrin (Johns Hopkins University), Karl Wegmann (North Carolina State University) and Rolfe Mandel (Kansas Geological Survey, University of Kansas)**

**[64]**

*Planetary Geoarchaeology as a New Frontier in Archaeological Science: Assessing Site Formation Processes on Extraterrestrial Bodies*

In 1957, *Homo sapiens* crossed a new threshold of technological innovation after constructing an artifact capable of entering Earth's orbit (Sputnik), paving the way for a future of space exploration. Over the past 65 years, we have been probing our solar system with rockets, satellites, orbiters, spacecraft, and landers, leaving traces of our presence on several planetary bodies (Earth's Moon, Titan, Mars, Mercury, Venus, and other extraterrestrial surfaces). As we expand our material footprint into new extraterrestrial environments, especially planetary and extraterrestrial surfaces, we need to understand the types of unique site formation processes capable of altering, destroying, or preserving this rapidly increasing archaeological record known as space heritage. Such understandings are germane to the subfield of geoarchaeology, that part of archaeology dedicated to studying the interaction

between humans, cultural heritage, and environmental systems from a geoscience perspective. Closely aligned and partially overlapping with Space Archaeology and Planetary Geology, we introduce a new subfield called Planetary Geoarchaeology and seek to open discussion about how geoarchaeologists can play a role in addressing issues surrounding space heritage.

**Holland-Lulewicz, Isabelle (Illinois State Archaeological Survey)**

[143]

*Zooarchaeological Evidence for Toxic Burrfish Use by the Calusa of Southwestern Florida, USA*

Recent zooarchaeological investigations identified unique assemblages that contained unprecedented numbers of toxic burrfishes (*Diodon* spp. and *Chilomycterus schoepfii*) remains, represented only by their maxillae and dentaries, at the Mound Key site (8LL2) in southwestern Florida. This paper explores the potential use of burrfishes by the Calusa of southwestern Florida beyond subsistence, since many species of burrfishes, including those assessed in this paper, carry tetrodotoxin in various parts of their body, a potentially lethal toxin. In this paper, I suggest the deposits examined at Mound Key likely represent past specialized production and possible use of a toxic resource not previously identified in the US Southeast.

**Holland-Lulewicz, Jacob (Washington University in St. Louis), Andrea Hunter (Osage Nation Historic Preservation Office) and Sarah O'Donnell (Osage Nation Historic Preservation Office)**

[15]

*Contentious Heritage-Making and Historical Dissonance at Contemporary Cahokia*

Beginning as early as the mid-nineteenth century, Cahokia and the physical legacies of Indigenous mound-building practices have been leveraged toward heritage-making efforts. From the branding of a rapidly urbanizing St. Louis as "Mound City" in the 1800s to inscription on the list of UNESCO World Heritage sites, there has been a marked inequity in regards to who is able to claim Cahokia as heritage. Whether it be local Euro-American industrialists or "the World," these popularized connections to place continue to overwrite contemporary Indigenous knowledge of their own ancestries. While these non-Indigenous heritage-making efforts are rooted in a recognized importance of the Indigenous histories manifested at Cahokia, descendant communities remain disenfranchised from these very histories being used to bolster Western heritage claims. Through an exhibition of historical branding, archaeological discourses, and recent archaeology of contemporary heritage tourism at Cahokia, we argue that there is a critical dissonance that defines the history of Cahokia-as-heritage, and that a major contributor to this dissonance is the historical and continued exclusion (or rejection) of Indigenous voices.

Hollenbach, Kandace [8] see Krus, Anthony

**Holliday, Vance (University of Arizona), Brendan Fenerty (University of Arizona), Kathleen Springer (US Geological Survey), Jeffrey Pigati (US Geological Survey) and David Bustos (National Park Service)**

[184]

*Late Pleistocene Geoarchaeology of White Sands National Park*

White Sands National Park lies within the Tularosa Basin, which once contained Pleistocene paleo-lake Otero. Holocene deflation of the lake beds created the White Sands dunes along with Alkali Flat, a playa. Archaeological site WHSA Locality 2 is on the eastern side of Alkali Flat between the playa and the dunes. A sedimentary sequence exposed by trenching and coring consists of 1.25 m of lacustrine clays and silts intercalated with and buried below thinly bedded gypsiferous and siliciclastic sands, silts, and clays, representing a transition from a lacustrine to an alluvial setting in the late Pleistocene. Tracks of late Pleistocene fauna including mammoth, ground sloth, canids, felids, bovids, and camelids, along with the human footprints are common in both the alluvial and lacustrine deposits in and near Locality 2. The area may be at or near the terminus of the Lost River, which drains west off the Sacramento Mountains and disappears under the gypsum dune system. We hypothesize that freshwater flow feeding the saline-alkaline paleo-lake attracted both the fauna and the humans. Younger Paleolithic sites are common along drainages on the basin margins between the mountains and the paleo-lake.

Holliday, Vance [105] see Huckell, Bruce

Holliday, Vance [184] see Odess, Daniel

**Hollimon, Sandra (Santa Rosa Junior College)**

[45]

*Walipo Practitioners, Lukeria Aipau Myers, and Fort Ross Man: A Metini Lineage's Role in Kashaya Archaeology and Ethnography*

Following Lightfoot's (2005) research strategy for historical anthropology and its incorporation of multiple lines of evidence, I discuss ethnographic information and oral traditions concerning walipo "enforcers" in Kashaya culture. These individuals functioned in ways similar to bear doctors and were socially sanctioned to punish wrongdoers. As an agent of social control, this position was available to both women and men. I include comparative material from the Coast Miwok and examine the role of gender in Miwok walipo practices. My primary focus is on the lineage of walipo practitioners that hailed from the village of Metini, whose last occupant was Lukeria Aipau Myers. Her grandson, Herman James, was a principal consultant for the linguist Robert Oswalt, and the oral traditions he collected are an important source for interpreting Kashaya archaeological sites. I also discuss the use of oral traditions to understand the culinary relationship between Lukeria and the person known as Fort Ross Man.

**Hollingshead, Analise (Pape-Dawson Engineers), Tara Skipton (University of Texas at Austin), Jayur Mehta (Florida State University), Brian Ostahowski (Gulf Communities Research Institute) and Theodore Marks (New Orleans Center for the Creative Arts)**

[46]

*We're Far from the Shallow Now: Assessing Climate Change Impacts in the Gulf of Mexico*

What would it mean to lose our cultural heritage within the Gulf of Mexico? As greenhouse gas emissions continue to increase and contribute to global warming, disastrous events such as Hurricane Michael in 2018 or sea-level rise continue to threaten terrestrial and submerged archaeological sites. With 39% of Americans living in counties directly on the shoreline, this is a serious concern; especially considering that the Intergovernmental Panel on Climate Change predicts anywhere from 0.5 m to 1.2 m of sea-level rise by 2100. Climate change today threatens a unique archaeological record located along or within the Gulf of Mexico that dates as far back as 20,000 years ago. We present information on archaeological sites located in the Big Bend region of Florida and the Mississippi River Delta, examining how climate change has or will impact both terrestrial and submerged archaeological sites. Through predictive modeling and direct observation, we highlight a few key narratives whose story has or will be significantly impacted by climate change.

**Holly, Donald (Eastern Illinois University) and Christopher Wolff (University at Albany)**

[28]

*Scaling Up and Bearing Down: Historic Period Changes in Beothuk Architecture, Social Organization, and Property Rights*

We examine two concurrent trends in later Beothuk history: changes to domestic architecture and social organization, and the narrowing of sharing obligations. The former include the emergence and growth of pithouses and communities, and the latter, the partitioning of resources and food storage. Both occur as European settlement and hostilities intensify, and the Beothuk are denied access to coastal resources. Changes may reflect a desire for companionship and safety on the part of the Beothuk, and adjustments to increased sedentism and a new subsistence economy. These developments illustrate how hunter-gatherer domestic architecture—especially pithouses—can track with changes to the social environment, and how social obligations can narrow under conditions of social stress.

**Holly, Donald (Eastern Illinois University)**

[28]

Chair

Holmes, Charles [57] see Wygal, Brian

**Holson, John**

[45]

*Social Memory, Cultural Continuity, and Population Shifts: Reexamining Models of San Francisco Bay Shore Native Occupations and Their Applicability to Interior North Coast Ranges Sites*

Since coming to Berkeley in 1987, Dr. Lightfoot has made several substantial contributions to the archaeology of the San Francisco and San Pablo Bay Areas and, specifically, the interpretation of shell mounds within a cultural evolutionary model (Lightfoot 1992, 1997; Lightfoot and Luby 2002). Lightfoot and Luby (2002), for example, acknowledge the early, moderately intense occupation of shell mounds along the San Francisco and San Pablo Bayshores. During the Middle period beginning approximately 500 BC, it is suggested that a more permanent occupation and use of shell mounds is concomitant with a rise in cultural complexity as evidenced by artifact, faunal, and burial assemblages. Finally, during the Late period, there is another shift in the occupation of the shell mounds toward abandonment, and at the same time, interior village sites become common. Several explanations are given for these observed patterns including ecological degradation, population shifts, availability of resources, and social memory of some duration regarding the use of the shell mounds as cemeteries. This paper will examine some of the dynamics of these patterns utilizing newly acquired data garnered over the last 10 years along the San Pablo Bayshore in contrast with interior sites along the Napa River, which flows into San Pablo Bay.

**Holt, Evan (Utah State University) and Stefani Crabtree (Utah State University)**

[47]

*Archaeological Lessons for Modern Ecology and Sustainability*

Archaeology has become a valuable tool for modern climate, ecology, and sustainability studies, currently even influencing IPCC reports. Modern quantitative methods in archaeological research informs and enhances our understanding of socio-ecological systems and sustainability. Network studies are the forefront of modern quantitative research in archaeology. These studies involve developing computational frameworks for embedding archaeological populations within ecosystems, for assessing the changes that humans carried out on ecosystems, and for assessing the statistical significance of these changes. These studies build networks of interaction between humans and other species. Although this type of research is not new, especially in ecology, these methods are innovative as most ecosystem networks ignore human activity. Comparison across cultures and ecosystems can advance our understanding of human impacts and interactions in different environments. This presentation will be the first comparative archaeo-ecological networks study leveraging work from Sanak Island, AK and the Colorado Plateau, CO. Sanak Island research focuses on a maritime ecosystem continuously inhabited for ~10,000 years by hunter-gather-forager Aleut communities, whereas the Colorado Plateau research focuses on a desert ecosystem inhabited by more sedentary Pueblo communities. Cross-cultural comparisons will lend insight toward the socio-ecological resilience, stability, and connectivity of these two communities and their local ecosystems.

**Holyoke, Kenneth (University of Toronto) and Branden Rizzuto (University of Toronto)****[109]***A Red Chert by Any Other Name: Evaluation of the Use of pXRF for Geochemically Discriminating Carboniferous Cherts of Southeast New Brunswick, Canada*

Washademoak Multicolored Chert is an archaeological term used to describe a fine-grained, translucent, and multicolored lithic material commonly found in archaeological assemblages in the Maritime Peninsula region of northern New England and eastern Canada. The source for this chert has been attributed to outcrops at Belyeas Cove along the shores of Washademoak Lake in south-central New Brunswick, Canada. However, recent surveys have shown that cherts that are macroscopically indiscernible from Washademoak Chert occur throughout New Brunswick in association with Mississippian-aged Mabou Group sediments. This poses a significant problem for sourcing chert artifacts in the region to their respective geological sources based on macroscopic examinations alone. Furthermore, Washademoak Chert artifacts are objects of ancestral Indigenous origin and geochemical characterization must be limited to nondestructive methods of analysis. Despite the limitations imposed by heterogeneous materials like chert, handheld energy-dispersive X-ray fluorescence spectrometry (pXRF) offers a low-cost, nondestructive, and portable method for obtaining elemental data from cherts and could aid in their geological sourcing. Using analyses of source-derived geological samples and artifacts from regional collections, here we evaluate if pXRF can be utilized to geochemically discriminate between different carboniferous chert sources of New Brunswick, thus refining the geological source(s) associated with Washademoak Chert.

**Hood, Amber (Chickasaw Nation)****[180]***Discussant***Hood, Larkin (Pennsylvania State University)****[165]***Discussant*

Hooker, Ed [81] see Whitney, Kristina

Hoover, Hannah [141] see Young, Lisa

**Hoppa, Kristin (Channel Islands National Park) and Jennifer Perry (California State University, Channel Islands)****[222]***Scorpion after the Fire: Understanding Prehistoric Land Use on Eastern Santa Cruz Island***[WITHDRAWN]****Horn, Maryke (University of the Witwatersrand), Dominic Stratford (University of the Witwatersrand), Stefania Merlo (University of Cambridge) and Kathleen Kuman (University of the Witwatersrand)****[186]***Legacy Assemblages of Hominin Fossils and Stone Tools Analyzed in a Three-Dimensional GIS Context: Clarifying the Stratigraphic Boundary between Member 4 and Member 5 of the Sterkfontein Caves, South Africa*

The caves of the Cradle of Humankind, South Africa, have yielded some of the most important paleoanthropological evidence in the world. Over the last 80 years, Sterkfontein has produced remarkable fossils and stone tool technology, documenting a long sequence of overlapping biological and technological evolution. Numerous assemblages from Sterkfontein are multigenerational and multidisciplinary (legacy) datasets with a finite spatial resolution of 3 × 3 × 1-foot grid-squares. Integrating legacy and modern datasets can be challenging because of their often-diverse spatial systems. The development of a 3D GIS-based geospatial framework at Sterkfontein has provided new opportunities to explore spatial data from the extensive paleoanthropological assemblages. Virtually "un-excavating" sites has the ability to contribute significant information regarding spatial contexts and formation processes at an inter- and intra-assemblage resolution. At the Sterkfontein Caves 3D GIS-enabled spatial analyses were used to interrogate the stratigraphic association and formation of Members 4 and 5 using the legacy datasets comprised of Australopithecus fossils and fossil wood from Member 4 and stone tools from Member 5. Greater spatial and stratigraphic confidence in the attribution of specimens to major units have the potential to assist in differentiating chronologically and stratigraphically distinct assemblages providing more surety to paleoenvironmental associations in- and between deposits.

**Horn, Sherman (Exploring Solutions Past) and Anabel Ford (University of California, Santa Barbara)****[54]***A Community of Makers or Takers? Quantitative Analyses of Inequality at Classic Period El Pilar*

Ongoing surveys in the El Pilar Archaeological Reserve, straddling the Belize/Guatemala frontier, have mapped 70% of the 20 km<sup>2</sup> scanned by airborne lidar and revealed the extent of settlement around the El Pilar monumental core. The large scale of civic architecture at El Pilar, and the distribution of smaller ceremonial groups and minor centers, reflect the wealth and power of Maya rulers presiding over the largest Classic period city in the upper Belize River area. Previous analyses suggest disparities in wealth at El Pilar were more nuanced than the elite/commoner dichotomy commonly invoked for Classic Maya society, although exactly how pervasive these inequalities were in the community remains to be discovered. This paper works to understand wealth inequality at ancient El Pilar by computing new site-wide quantitative measures—Gini coefficients and Lorenz curves—from settlement survey

data. We interpret these new measures in the context of residential group labor investment calculations and settlement pattern analyses to understand how disparities in wealth may have been distributed across the physical and social landscape.

**Horowitz, Rachel (Washington State University)**

[220]

*Economic Integration and Obsidian Consumption in the Late Postclassic Period K'iche' Region*

While economic activities among the Classic period Maya have been widely studied, studies of economic interactions in the Postclassic period are less common. Many such studies have focused on obsidian analyses and technology, as proxies for trade and exchange. Furthermore, obsidian procurement has often been used as a proxy for the centralization (or lack thereof) of economic and political organization. This paper builds on such studies, using a legacy collection of obsidian implements collected during archaeological surveys in the 1970s to examine Late Postclassic (1200–1524 CE) economic networks in the Utatlan region of highland Guatemala. Obsidian collections from the site of Q'umarkaj and the surrounding Utatlan region, an area of K'iche' settlement, were examined through technological analyses of obsidian production and preliminary geochemical obsidian sourcing. These analyses allow an analysis of the relationships between the K'iche' capital of Q'umarkaj and the surrounding region through obsidian acquisition networks. These data will provide information on the role of economies in Late Postclassic political organization, particularly the degree of economic integration of peripheral settlements with the capital region.

**Horrell, Christopher (Submerged Archaeological Conservancy International), Melanie Damour (Submerged Archaeological Conservancy International), Roberto Junco (Instituto Nacional de Antropología e Historia) and Frederick Hanselmann (Rosenstiel School of Marine and Atmospheric Science)**

[46]

*Conquest: The Lost Ships of Cortés Project and the Search for a 500-Year-Old Scuttled Fleet*

The discovery and exploration of Mexico during Spanish expeditions of 1517 and 1518 set the stage for the conquest of Mexico. Appointed by the governor of Cuba in 1519, Hernán Cortés led another expedition to explore and establish trade relations. As the expedition gained momentum, mutiny and dissension among the ranks forced Cortés to scuttle 10 of his 11 ships in the harbor below the newly established town of Villa Rica de la Vera Cruz. In 2018 and 2019, the Lost Ships of Cortés Project conducted geophysical surveys and diver investigations to identify the 500-year-old remains of these scuttled vessels. This paper discusses the results of the first two field seasons, what has been learned to date, innovations in marine survey techniques and underwater archaeology, the development of new tools and methodologies to enhance our ability to locate these sites, and future work.

**Horta, Pedro (ICArEHB, Universidade do Algarve), João Cascalheira (ICArEHB, Universidade do Algarve) and Nuno Bicho (ICArEHB, Universidade do Algarve)**

[98]

*The Recurrent Use of Lithic Bipolar Technology as a Resource Extraction Strategy during Upper Paleolithic of Vale Boi*

The adaptive strategies that facilitated modern humans' settlement in Europe have been a long-standing question in Human Evolution studies. Traditionally, this role has been attributed to the ever-changing adaptive techno-complexes of the Upper Paleolithic. However, recent studies have shown that innovations of older technologies may have played a more direct role in the settlement strategies of modern humans in Europe. More precisely, the use of bipolar (on anvil) methods as a strategy for enhancing resource exploitation has been shown to have had a significant impact throughout all of the Upper Paleolithic record in Western Europe. The site of Vale Boi presents an excellent example of this, as bipolar technology is ever present throughout the chronostratigraphic sequence of the Upper Paleolithic. This talk explores this recurrent use of bipolar technology during the site's occupations. Focusing on its functional, technological, and cultural aspects during the settlement in the region. And ultimately, reiterating its success as a resource extraction adaptive strategy and its role as essential indicator of efficiency evaluation throughout the Upper Paleolithic at the site.

**Hosler, Dorothy**

[14]

*Recent Insights into Southwest / West Mexican Interactions*

Recent research examining West Mexican and Southwest interactions has dramatically altered a long-held assumption regarding the source of Mexican turquoise. The Southwest supplied none of it, and the abundant literature surrounding these interactions is no longer relevant. This was a crucial paper. The data disarticulated many of our assumptions regarding the interdependent relation between these spatially and culturally distinct polities. Victoria Vargas wrote a meticulously researched master's thesis on Southwest copper bells that has withstood the test of time and may still. Two questions emerge when considering Vargas's work. One is whether lead isotope studies of the southwestern copper bells would definitively demonstrate that the metal (and the objects) were made from Mexican copper ores. If so, the second question—what it is about metal objects that encouraged southwestern people to accept what was essentially a foreign technology? Do we have sources that allow us to understand how they interpreted this completely new material?

**Hosler, Dorothy**

[155]

*Discussant*

**Houk, Brett (Texas Tech University) and Arlen Chase (Pomona College)****[153]***Alphawood Foundation's Maya Archaeology Program*

The Alphawood Foundation, located in Chicago, Illinois, has become a key funding agency for Maya archaeology. The foundation is a nonprofit, grant-making institution that has supported the arts, arts education, architecture and preservation, and social justice among other items since 1992; its declared mission is to work "for an equitable, just, and humane society." Alphawood added Maya archaeology to its portfolio in 2009. Over the years, the number of projects gradually grew to number 16 by 2019. Generally awarding multiyear grants to its researchers, Alphawood has had a tremendous impact on the field of Maya Studies and has dramatically advanced our knowledge of the ancient Maya while at the same time supporting local economies among impoverished populations in Belize, Guatemala, and Mexico. In this paper, we review the history of Alphawood's involvement in Maya archaeology and highlight the impacts it has had on the types of questions its grantees ask, the methods they employ, and the contributions they have made to our understanding of these ancient peoples. The papers in this session celebrate the diversity of approaches and interests that Alphawood has supported over the years.

**Houk, Brett (Texas Tech University)****[153]***Chair***Houston, Gordon****[103]***The Houston Solar Marker Matrix, Revised*

Solar markers are rock art motifs placed to interact with sunlight and shadows on culturally significant days. Solar markers are a mnemonic device encoding astronomical information, and visual evidence of a cultural practice. The astronomical interpretation of solar markers may be the most objective interpretation of rock art. Rock art is ubiquitous around the world, yet, there is a paucity of reports of solar markers outside the significant numbers reported in the American Southwest. The first solar markers were discovered by chance when being observed on or near specific solar points. The need to objectively evaluate solar markers interactions led to the Houston Solar Marker Matrix (HSMM). The first version of which was presented at the 2014 SAA annual meeting in Austin, Texas. The HSMM is a tool to be used to evaluate and confirm solar interactions with rock art, and also, to act as a guide to identify new solar markers. It is hoped that the HSMM will help inform researchers on the astronomical potential of solar interactions with rock art they encounter, leading to additional reports worldwide. The final result will be the creation of a data base of information for statistical analysis.

Houston, Stephen [104] see Clark, Morgan

**Houston, Stephen (Brown University)****[128]***Days of Our Lives: Identities, Rites, and Calendrical Determinants among the Maya*

An intriguing feature of Maya day and month signs is that they show consistent correlations. Mythic figures occur with certain days, and particular rituals link to specific times. This essay, which honors Karl Taube's study of calendrical nuance and godly narrative, explores such patterns in the glyphic corpus. Ranging from Preclassic to later times—and building on contributions by other scholars—it discerns local emphases and broadly held practices. The overall claim is that much ritual behavior was non-random and that an orderly set of constraints guided meaningful action among the ancient Maya.

**Howey, Meghan (University of New Hampshire)****[9]***Discussant***Hoyle, Alesia (University of Texas at San Antonio)****[92]***Watery Relations: Assessing Complex Hydrological Systems and Pastoralism in the High Puna of the Bolivian Apolobamba***[WITHDRAWN]**

Hroncich-Conner, Maria [24] see Wurtz Penton, Michelle

**Hronec, Laura****[37]***Discussant*

**Hruby, Zachary (Northern Kentucky University)****[128]***Stones of the Earth, Stones of the Sky: Doing Lithic Analysis through a Taubean Lens*

This talk introduces Taube's iconographic, phenomenological, and replicative approaches to understanding Indigenous Mesoamerican ontologies of stone. I discuss how Taube's unique perspective informed my own work on stone artifacts, with a special focus on flint, obsidian, and jade. The goal is to illustrate that understanding possible meanings of objects and materials can be useful at all levels of analysis from sourcing to technology, as well as symbolic interpretations.

**Hruby, Zachary (Northern Kentucky University)****[128]***Chair*

Hrynicky, M. Gabriel [114] see Patton, Katherine

Hsu, Yen-Shin [201] see Aguayo, Esther

**Hu, Lorraine (Washington University in Saint Louis)****[186]***Landscapes of Memory and Cremation Practice in the Pastoral Neolithic of Kenya*

Funerary sites built by ancient herders around the world have often shared the central similarity of stone architecture as commemorative architecture. Built cemeteries are conspicuous points on often-ephemeral pastoralist landscapes and have been discovered to aid in negotiating community identity, strengthening social networks, and (re)producing social memory. Less is known about hidden spaces in pastoralist funerary traditions, where communities chose to invest in natural rocky features rather than built architecture. Cremation burial sites dating to the Pastoral Neolithic in southern Kenya (~3000–1000 BP) are found in rockshelters and caves, and in one instance, a deliberately buried hillside crevice. Lacking in built structures, these sites, nevertheless, reflect significant social investment involving extensive collection of pyre fuel, crafting of grave goods, and postmortem alteration of bodies. As scholars have broadened perspectives of pastoralism and African monumentality away from previous biases, the conceptualization of seemingly natural features as the sites of significant labor and care can add to more holistic interpretations of early pastoralist social practices.

**Hu, Lorraine (Washington University in Saint Louis)****[43]***Discussant*

Hu, Songmei [158] see Hirai, Nina

Hua, Quan [181] see Leroy, Stéphanie

**Huang, Cindy Hsin-yee (Arizona State University), John Murray (Arizona State University), Sydney James (Arizona State University), Alexa Ithxayana Ferrer (Arizona State University) and Jonathan Paige (University of Texas at San Antonio)****[20]***Flake It 'Til You Make It: Raw Material Quality, Skill, and Variation in Stone Tool Production*

Stone tools are the most numerous and lasting record of prehistoric behavior and cognition. However, interpreting lithic archaeological evidence requires a clear understanding of the processes of tool creation. Assessing tool-maker skill and understanding the required competences of lithic tool production is important in the broader framework of lithic knowledge transmission. However, robust methods for measuring variation in skill from lithic artifacts are still in development. One obstacle to this development is a lack of understanding about how the qualities of lithic raw materials influence our ability to detect variations in skill. Furthermore, there have been few attempts to replicate other studies designed to address how raw material variability influences the measurement of skill. In this study, two expert and two novice knappers are asked to produce flakes from nodules from high, medium, and low-quality flint. Raw material quality will be measured through surface roughness, hardness, and the presence of inclusions. Data on the attributes from the flakes and cores will be collected and then compared within and between both raw materials and individuals to assess the impacts of both variables. Our results will help refine which attributes are useful for understanding tool-maker skill in the archaeological record.

**Huckell, Bruce (University of New Mexico), Vance Haynes (University of Arizona), Vance Holliday (University of Arizona), Gregory Higdins (University of Arizona) and Lisa Huckell (University of New Mexico)****[105]***Dating the Naco Clovis Site*

Previous efforts to date the Naco Clovis site in southeastern Arizona failed to produce acceptable results. In 2020 small pieces of charcoal were found in sediment adhering to the distal fragment of a mammoth ulna from the site, donated in 2011 to the Arizona State Museum by David Navarrete, grandson and nephew of the original discoverers. Three AMS radiocarbon dates were obtained from individual charcoal lumps, and two more on a sample of multiple tiny flecks. The single lumps produced a weighted mean of 13,067–12,767 cal BP, fitting within the range of Clovis ages obtained from the nearby Lehner and Murray Springs sites and those

from other Clovis sites. Humic acid and residue ages on the fourth sample were younger. Further, archival research revealed that a previously unreported second season of excavations took place at Naco in 1953, doubling the extent of the 1952 excavation area and revealing three bones representing a second mammoth and scattered charcoal, but no artifacts. These results are combined, and their implications for understanding the mammoth kill and its taphonomic history are presented. Finally, possible sources of the charcoal—cultural and natural—are evaluated, and their effects on the dates are considered.

Huckell, Lisa [105] see Huckell, Bruce

**Hudson, Jean (University of Wisconsin–Milwaukee) and Amy Klemmer (University of Wisconsin–Milwaukee)**

[3]

*Ecological Parameters and Social Trajectories, Coastal Samples from Ecuador and Peru*

This presentation compares three ecological parameters in three locations along the Pacific coast: southern Ecuador, northern Peru, and southern Peru. The ecological parameters focus on archaeological evidence for use of local fauna, assessment of farming potential, and impacts of ENSO and other environmental perturbations. These are then compared with the timing and nature of four aspects of social trajectories in the same regions: household size, community size, degree of sedentism, and evidence for connections between communities. The goal is to gain insight into the potential relevance of these variables and their interactions, understanding that the sample size will limit the robusticity of results, but hoping the comparisons might provoke further discussion. Data come from both the authors' own research and the published works of others. Some attention will be devoted to the evaluation of the comparability of data and suggestions for facilitating future interregional comparisons, particularly for zooarchaeological data.

**Huerta, Danielle (University of California, Santa Cruz)**

[41]

*Searching for Those Who "Practiced": An Ethnographic Perspective on Rio Grande Glaze Ware Glaze F Production*

As a mentor and archaeologist, Judith Habicht-Mauche has always encouraged her students to step outside of the science of archaeology and make connections with people, in order to give the stories we tell a more tangible human aspect. After all, archaeologies of practice are meaningless without attempting to connect them back to those who actually "practiced" in the past. This poster presents ethnographic data on the seventeenth-century production of Rio Grande Glaze F pottery, obtained by interviewing contemporary Pueblo potters who are descendants of former Glaze Ware producing Pueblo villages. This research is part of a larger dissertation project that aims to better understand how the shifting colonial landscape of seventeenth-century so-called New Mexico impacted the production of Rio Grande Glaze Ware, ultimately leading to the end of Glaze Ware production in the early 1700s.

Huerta, Danielle [41] see Habicht-Mauche, Judith

Hughes, Baylee [197] see Alhambra, Dominique

Hughes, Cory [88] see Martin, Samuel

Hughes, Tyson [190] see Hasbrouck, Tayler

Huidobro Marin, Gonzalo [173] see Glowacki, Donna

Hull, Emily [159] see Gonzales, Mikayla

**Hull, Kathleen (University of California, Merced)**

[45]

*Turning the Tables: Interpreting the Deep Past in Light of Insights from the Recent Past*

In 1995, Kent Lightfoot argued persuasively that archaeological interpretation of the colonial-era experience of Indigenous peoples must be contextualized through an understanding of, and appreciation for, the deeper history of a group. In addition, he advocated for the use of multiple lines of evidence—the archaeological record, ethnohistoric data, ethnographic information, and Native oral accounts—to provide the fullest picture possible of this colonial experience. More than two decades of research in this tradition, however, has also revealed how significant these insights on the archaeology of colonialism can be to the interpretation of Indigenous life in the distant past. That is, the research approach advocated by Lightfoot is proving revelatory and inspiring with respect to inferences archaeologists can draw on millennia of Indigenous life in North America. This progress is illustrated by examples from California that demonstrate that received wisdom and entrenched theoretical perspectives are ripe for challenge when we have colonial-era Native decision-making as a guide to the deep past.

**Hull, Kathleen (University of California, Merced)**

[45]

*Chair*

**Humphreys, Stephen (Durham University)****[100]***Discussant*

Hunt, Abigail [12] see Clements, Sarahjayne

Hunt, Turner [223] see Birch, Jennifer

**Hunter, Andrea (Osage Nation)****[15]***Cahokia: Place of the Children of the Middle Waters*

For decades native communities have expressed the need for our voice to be included, our interpretations of our own histories be acknowledged, and our inclusion in the decisions of what research should or should not be conducted on our ancestor's themselves and our ancestor's places of residence, ceremony, domestic components, and burials. For the Osage Nation, there have been very few instances of academic researchers contacting us to provide such opportunities. There has been only the instance of the researchers associated with Picture Cave who extended invitations to Osage elders and artists. Scholars of Cahokia and the Mississippian culture in the greater St. Louis area would have a more complete study and interpretation by including Osage scholars and scholars of our Dhegiha relatives the Kaw, Ponca, and Omaha, all of whom ancestors were key contributors to the development and success of our shared culture that flourished for several hundred years.

Hunter, Andrea [15] see Holland-Lulewicz, Jacob

Hunter, John [24] see Wampler, Marc

**Hunter, Raymond (University of Chicago)****[126]***Colonial Agrarianism: The Afterlives of Inka Fields in Colonial Ollantaytambo*

This paper traces changes in agricultural land use across the transition from Inka (ca. 1400–1532) to Spanish colonial (1532–1820) rule near the town of Ollantaytambo, in the Cusco region of Peru. At Ollantaytambo the ancient agricultural landscape is ostentatious; many fields surrounding the town were designed under Inka rule to be prominent features of landscape that indexed Inka power. Thus, the archaeological challenge is not to locate agricultural features on the landscape, but rather to understand how those fields and pastures have been differently positioned within the varying agricultural and political regimes that have governed the region since the collapse of the Inka state. Archival, excavation, and remote sensing data from recent archaeological work at the site of Simapuquio-Muyupata, on the outskirts of Ollantaytambo, clarify how Andean farmers responded to the impositions of Spanish colonization. This research shows how agricultural lands built by the Inka were transformed in the colonial era as farmers adopted foreign plants and animals, in the process, creating a new colonial agroecology that continues to shape patterns of land use in the region centuries later.

Huntley, Deborah [150] see Eckert, Suzanne

Huntley, Deborah [41] see Ferguson, Jeffrey

Huntley, Deborah [66] see Turney, Kathryn

Hurla, Brendan [173] see Wichlacz, Caitlin

**Hurst, Heather (Skidmore College)****[128]***Critters, Crud, and Corn God Fans: Karl Taube and the Study of Maya Mural Iconography*

Karl Taube's interest in painted works of Mesoamerica is a continuous thread through his academic career. This paper highlights Karl Taube's contribution to the study of Maya wall paintings at San Bartolo, Guatemala, and our current academic understanding of Preclassic Maya origin mythology. Following numerous seasons of field and lab participation, Taube's distinct methodology of iconographic study will be discussed, as well as the relevance of his work to public engagement with ancient Maya imagery.

Hurst, Heather [11] see Rossi, Franco

**Huskey, Delphi and Eden Washburn (University of California, Santa Cruz)****[41]***Weaning and Early Childhood Diet during the Late Intermediate Period in the Peruvian Northern Highlands*

The Late Intermediate period (ca. AD 1000–1450) of Peru is thought to have been a time of great socioeconomic uncertainty and political fragmentation. During this time, interpersonal violence increased, and the new placement of settlements provided not only defensible space but also access to the high-altitude puna grassland suitable for grazing camelid herds. These high altitudes also present an inherent risk to populations living in these environments such as low oxygen availability. Here individuals face challenges

such as food insecurity and hypoxia. Due to these challenges, it is thought that mothers may have chosen to breastfeed their infants longer to mediate this stressor. This study employs  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  analysis of serial samples from first molars to study the age weaning and early childhood diets of individuals ( $n = 29$  total individuals) from the high-altitude sites of Marcajirca, Ushcugaga, Jato Viejo, and Nawpamarca within the Conchucos region of the north-central Andes. The results of this study suggest high parental investment with children being weaned around three years of age on average with no statistical differences between children's sexes. This study reports the first data on age of weaning and early childhood diet for populations living within the Conchucos region of Peru.

Hussain, Shumon [47] see Yaworsky, Peter

**Huster, Angela (PaleoWest)**

[96]

*Imports and Knock-Offs: The Uses of Aztec Black on Orange at Postclassic Calixtlahuaca*

This poster presents evidence for multiple producers and sources of Aztec Black on Orange ceramics at the provincial city state of Calixtlahuaca. It is a truism in archaeology that a stylistically out of place object can be the result of an object (exchange), a person (migration), or an idea (emulation) moving between two regions. Despite this, Aztec Black on Orange ceramics found outside of the Basin of Mexico are usually considered have been trade items, despite increasing evidence of local production in multiple provinces of the Aztec Empire. This poster presents INAA and attribute data to distinguish between examples of the type resulting from each of the three processes. Differences in the spatial and temporal variation of the three groups are evaluated to determine whether the different origin processes may have affected how users perceived the resulting ceramics.

**Hutson, Scott (University of Kentucky)**

[148]

*Who Publishes Where and How Does This Correlate with Grants, Personal Connections, Institutional Prestige, and Gender?*

Choice of publication venue has important consequences for the careers of academic archaeologists. This paper compares the set of authors in the SAA's flagship journals with those who publish in journals where personal networks play a role in who gets published, those who publish in highest prestige venues such as *Science*, and those who publish in well-known blogs. These four sets of authors are then compared to the set of researchers who have received grants from the archaeology program of NSF. This paper explores the degree of overlap and disjunction between these five groups of archaeologists, not just in terms of the authors themselves but in terms of institutional affiliation and gender of first authors. As such, this paper contributes to research that documents the degree of inequality among archaeology programs and gender.

Hutson, Scott [54] see Stanton, Travis

**Hyde, David (Western Colorado University) and Fred Valdez Jr. (University of Texas at Austin)**

[83]

*Shedding Light on the Pre-Maya to Maya Transition: Continuity and Discontinuity in Lithic Technology at Colha, Belize*

Occupation of the Maya Lowlands begins with pre-Maya Paleoindian and later Archaic populations that extend back to at least 12,000 years ago. The beginnings of what we call Maya first appear around 1000 BC in the Lowlands, during the Middle Preclassic period. Though the Maya Highlands have evidence for Early Preclassic occupations, the transition from pre-Maya to Maya, 2000–1000 BC, is poorly understood in the Lowlands. Colha is a medium sized Maya site known for its extensive Preclassic and Classic stone tool workshops. Data has been recovered for a pre-Maya occupation of the site. In this paper, we will attempt to shed light on the Pre-Maya to Maya transition by examining continuities and discontinuities in the lithic technology from the site of Colha in the Northern Belize Chert Bearing Zone.

Hyde, David [91] see Godhardt, Ava

Hyde, David [210] see Thompson, Lauri

Hyland, Sabine [192] see Lau, George

Hynes, Mary [114] see Bridges White, Elizabeth

**Iannone, Gyles (Trent University), Scott Macrae (Trent University) and Kong Cheong (American University)**

[218]

*The Cityscape of Bagan, Myanmar: What We Know, What We Think We Know, and What We Would Like to Know about the Classical Burmese (Bamar) Capital*

Bagan was the capital of an expansive empire, the political and economic territory of which encompassed most of what is today the country of Myanmar. Although it is presumed to have been a low-density agro-urban center—given the dispersed nature of the over 3,500 features comprising its 80 km<sup>2</sup> monument zone—knowledge concerning the internal structure and overall development of the metropolis has been largely restricted to what can be gleaned from historical texts, and, to a lesser degree, artistic depictions of urban spaces and places. As detailed archaeological survey and excavations have seldom been conducted within the monument zone, and sophisticated geospatial analyses of the architectural features found within the vast cityscape have rarely been carried out, independent, empirically based insights capable of augmenting or potentially even challenging the dominant historical narrative

remain underdeveloped. In this discussion we consider the various historical and artistic datasets, as well as insights from those geospatial analyses and archaeological studies that have been carried out to date, to outline what we know, what we think we know, and what we would like to know about the place that was once known as Arimaddanapura, the "City of the Enemy Crusher."

Iannone, Gyles [82] see Cheong, Kong  
Iannone, Gyles [181] see Macrae, Scott

Ibarra, Bebel [157] see Washburn, Eden

**Ibarra López, Miguel (Centro INAH Michoacán), Karla Fernanda Rodríguez Rodríguez (Centro INAH-Michoacán), Alfonso Gastélum Strozzi (ICAT-UNAM) and José Luis Punzo Díaz (Centro INAH-Michoacán)**

**[174]**

*First Analysis of a Sample of Cremated Skeletal Remains from the Ossuary of the Great Platform from Tzintzuntzan, Michoacán, Mexico*

For the Tarascan culture, fire and firewood were considered very important elements of their cosmovision. Very important were the activities related to death that involved the use of fire, for example in the funeral pyres for the Irecha or the other main lords, where their bodies were cremated. Likewise, we have been able to see differential use of fire in the deposit of the Tzintzuntzan Ossuary, an issue mentioned since the first archaeological investigations in the early twentieth century. In this context, during the 2011 season, a concentration of fragmented bone remains, equivalent to 1,151 pounds, was recovered from the great platform of the archaeological site of Tzintzuntzan. Most of the bone remains showed traces of thermal action; however, there is no reference to the reason for which they were found, which could speak of other types of rituals or activities. This poster presents the first results of the morphoscopic analysis of this sample, as well as studies on thermal treatment using different optical techniques.

**Iglesias, Christina (California State University, Los Angeles)**

**[177]**

*Reconceptualizing Subterranean Space at Chichen Itza*

In 2019, I investigated a small, subterranean chamber atop a multilevel structure in the pueblo of San Felipe Nuevo some 839 m NE of the El Castillo pyramid at Chichen Itza. The round, finely finished chultun-like entrance measures 46 × 53 cm. The chamber itself is roughly spherical, measuring 1.65 m in diameter with a rounded bottom and 1.72 m high from floor to ceiling. The walls of the chamber have a thin coating of plaster, 0.3–0.9 cm thick. The plaster and olla-like shape are suggestive of a function related to water retention. This was reinforced by the drainage characteristics of the plaza. After a short rainstorm, the chamber quickly filled with water. The small size, however, eliminated it as a chultun in the normal sense. The location on the highest level of the platform suggests some sort of public function, and the fact that it was centered in a square plaza implies a layout with cosmological significance. I propose that the feature served as a reservoir for *zuhuy ha*, or virgin water.

**Iglesias Ponce de León, Josefa**

**[53]**

*El Tikal Project y el Proyecto Nacional Tikal: Una historia de amores y desamores*

Esta presentación es una breve y personal historia de los encuentros y desencuentros entre algunos de los tikaleños que participaron en el Tikal Project (1956–1969) y en el Proyecto Nacional Tikal (1979–1985). Al tiempo es una llamada de atención y un canto de esperanza a porqué es tan importante que la generosidad y la amistad estén presentes en cualquier campo profesional, pero en este caso, la Arqueología Maya.

**Iizuka, Fumie (University of California, Merced)**

**[51]**

*Sedentism, Exchange, and Sea-level rise: Inter-site Ceramic Variability of the Late Pleistocene Tanegashima Island, Japan*

Among the archaeological contributions of Mark Aldenderfer is research on mobility, adaptation, and change during preceramic to ceramic period transitions. My research applies some of his approaches to study the late Pleistocene origins of ceramics in southern Kyushu of southern Japan. A subsistence organization with a high degree of sedentism and pottery use emerged with the Incipient Jomon, 14,000/13,500–12,800 cal BP, representing a drastic change from the residentially mobile adaptation in the terminal Upper Paleolithic. This is especially evident on Tanegashima Island, an island likely isolated by sea-level rise around the onset of the Incipient Jomon, and an ecotone. In this research, building on petrographic sources established on pottery from the Sankakuyama I site, I classify pottery from the Onigano and Okunonita sites on Tanegashima by inclusion types using a stereoscope. The result shows that both Onigano and Okunonita have mainly locally made pottery but Onigano has more vessels transported from outside of Tanegashima. This may indicate that occupants of both sites were sedentary with access to concentrated and predictable resources, but those of Onigano responded more to the sea-level rise and buffered risks by engaging in exchange networks. These behavioral differences require further explanations.

**Iizuka, Fumie (University of California, Merced)**

**[51]**

*Chair*

Iizuka, Fumie [120] see Izuho, Masami

Ikehara, Hugo [129] see Koons, Michele

Iñáñez, Javier [29] see Pareja, Dante

**Ingalls, Victoria (Acacia Heritage Consulting) and Rachel Feit (Acacia Heritage Consulting)**

[4]

*Heat and Repeat: Investigations of Middle Archaic Campsite Along Hickory Creek in North Texas*

Well stratified and dated Middle Archaic period sites in north-central Texas are rare. The recent discovery and investigation of a multicomponent Middle Archaic campsite, 41DN580, is providing insights into seasonality, migration, and land use in Texas's Upper Trinity River basin. Excavations and subsequent analysis used a variety of methods to test hypotheses about the lifeways and land use of hunter-gatherers who lived in this region from roughly 5,000–3,800 years ago. The results of geoarchaeological studies, experimental efforts, lipid, and other analyses are presented to provide a context from which to explore the ways in which ancient native peoples in north-central Texas understood landscapes and the resources within them.

**Ingleman, David and Vicky Oelze (University of California, Santa Cruz)**

[23]

*From Life on the Beach to Death at the Palace: Dental Iso-biographies of Nineteenth-Century Hawaiian Dogs*

Prior to the mid-nineteenth century, Hawaiian ethnohistory suggests that most dogs were raised on plant-dominated starchy diets within rural commoner households before being presented to elites as *ho'okupu* (offerings). To investigate historical developments in canine husbandry subsequent to the colonial encounter we collected evidence on dental pathology and isotope ratios ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ,  $\delta^{18}\text{O}$ ) from sequentially sampled archaeological dog enamel and dentine. Our study included isolated teeth from mid-nineteenth-century 'Iolani Palace in urban Honolulu ( $n = 7$ ) as well as teeth from a presumed traditional ( $n = 3$ ) and a presumed modern ( $n = 5$ ) dog burial from rural and coastal He'eia State Park. We interpret an overall lack of dental caries and moderate dental attrition, as well as high  $\delta^{15}\text{N}$  values ranging from 8.5 to 13.9‰ ( $\bar{x} = 11.9\text{‰}$ ,  $\pm 1.4\text{‰}$   $1\sigma$ ) and low  $\delta^{13}\text{C}$  values ranging from  $-18.8$  to  $-12.9\text{‰}$  ( $\bar{x} = -15.6\text{‰}$ ,  $\pm 1.3\text{‰}$   $1\sigma$ ) as evidence that all dogs consumed high quantities of marine fauna, but in variable proportions. The  $\delta^{18}\text{O}$  values ranged from  $-7.0$  to  $-2.4\text{‰}$  ( $\bar{x} = -4.4\text{‰}$ ,  $\pm 1.2\text{‰}$   $1\sigma$ ) without distinct patterns. We suggest that, though historically undocumented, dogs consumed in elite palace meals were raised in diverse rural settings and fed marine protein rich diets in their households until some may have been offered as *ho'okupu*.

Ingleman, David [41] see Britton, Emma

Ingleman, David [41] see Habicht-Mauche, Judith

**Ingram, Scott (Colorado College)**

[215]

*Understanding Past Climate-Related Migration for Our Warming World*

As anthropogenic climate warming and associated climate extremes increase, insights from a century of effort in the US Southwest to understand climate-related migration should be shared to assist with modern drought planning efforts. Toward this end, this paper makes two parallel contributions. First, a surprising finding from the central Arizona portion of the Arizona Transition Zone will be shared: people with access to the most water in central Arizona were also the most likely to migrate when confronted with dry conditions. Second, how this finding can be helpful to modern drought planners and others preparing for a warming climate will be argued. Millions of smallholder farmers today practice agricultural strategies similar to those in the past. The results of this research provide an example of how the past can inform the present and should stimulate archaeological efforts to specifically address the challenges of a warming world.

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

[13]

*Practice and Public Spheres in the Preclassic Maya Lowlands*

Recent theoretical discussions have revealed problems in the Weberian assumption of the concordance between actions and perceptions. It is necessary to shift our attention to the historically specific configurations of social fields that condition people's political actions, i.e., public spheres, and their recursive relations with practice. This paper examines the transformations of public spheres and practice in the Preclassic Maya lowlands and discusses how they shaped the institution of governance during the subsequent periods.

Inomata, Takeshi [153] see Triadan, Daniela

**Intrator, Midori (University of Haifa)**

[191]

*Equids in the Levantine Middle Paleolithic: The Case of Neshar Ramla*

Equids were an important large game for humans throughout the Pleistocene. Equids may serve as good paleoenvironmental markers as each species has particular adaptations that can reflect where the humans that hunted them were foraging. During the Pleistocene, zebras and African asses were found in Africa, while horses and hemionos spread over Eurasia. Because the Levant acts as a bridge between these areas, it is a key location for studying the presence of equid species and their relevance to

intercontinental migrations. However, the evolution and co-occurrence of equids throughout the Middle Paleolithic has proven a challenge for zooarchaeologists worldwide when attempting to differentiate between species. We studied the equid remains from the entire faunal assemblage of the open-air site of Nesher Ramla (MIS6/5, central Israel), one of the largest equid assemblages from the Middle Paleolithic of the southern Levant (NISP = 365; 5%–22% of the ungulate remains along the 8 m thick sequence). After conducting a detailed study including both morphological and morphometric methods, we acknowledge the presence of at least two different groups of equids present at the site including *Equus hydruntinus* and *Equus hemionus/africanus*, which enables us to further pinpoint the environmental conditions and human hunting behaviors.

**Iorga, Anastasia (Stony Brook University), Carrie Wright (Stony Brook University), Troy Rasbury (Stony Brook University) and Katheryn Twiss (Stony Brook University)**

**[158]**

*Solidifying Mobility and Landscape Use Inferences: Assessing Bone and Enamel Diagenesis Across Ur via Strontium Isotope Analysis*

Animal remains from the southern Mesopotamian city-state of Ur have the potential to reveal diverse forms of human/animal interaction in the ancient urban environment, especially when approached with a combination of zooarchaeology and isotope biogeochemistry. Texts, iconography, and archaeological remains testify to extensive trade both within and beyond Bronze Age Mesopotamia, and patterns of animal as well as human distribution and movement across the landscape are questions of widespread interest. Strontium isotope analysis is widely recognized as a powerful tool for studying ancient landscape use and mobility. Unfortunately, the diagenetic processes affecting bone and teeth across Ur are not yet fully understood, which hinders interpretations of its faunal strontium isotope values. This research uses animal bones, teeth, and soil recovered during recent excavations at Ur to investigate the impact diagenesis has had on strontium concentration and isotope composition in bones and teeth discovered in multiple locations across the city. These results provide insight into local biogenic isotope signal preservation conditions; in doing so, they offer foundational considerations for interpreting isotopic data and creating isoscapes in southern Mesopotamia.

Iorga, Anastasia [158] see Jaramillo, Sara

Iraeta Orbegozo, Miren [19] see Schroeder, Hannes

**Iriarte, Jose, S. Yoshi Maezumi Maezumi (University of Amsterdam), Daiana Travassos (Universidade Federal do Para), Regina Gonda and Sarah Elliot (University of Bournemouth)**

**[151]**

*Amazonian Dark Earths, Polyculture Agroforestry Systems, and Their Modern Legacy*  
**[WITHDRAWN]**

Isayev, Elena [157] see Scaffidi, Beth

Islebe, Gerald [48] see Torrescano-Valle, Nuria

Isley, Mark [184] see Bustos, David

**Ivarsson-Aalders, Marieke (Stockholm University)**

**[17]**

*Finding the Adolescents of the Viking Age: Bioarchaeological Perspectives toward Adolescence on the Island of Gotland, Sweden*  
The Scandinavian Viking Age (AD 750–1050) is often regarded as a time of violence. Even though most Vikings were farmers, they were part of a society in which violence remained constantly present. Daily life was shaped by cultural norms that reinforced martial ideals. These ideals were also conveyed through everyday aspects of childhood; instilling warlike values through play. How was childhood experienced and perceived, in a highly militarized society where children were exposed to violence from a young age? Through the analysis of material culture, literary sources, and skeletal remains from a number of Viking Age settlements on the island of Gotland (Sweden), this presentation aims to explore how Viking Age childhood may be understood within the cultural understanding of the entire life course. Instead of having been a fixed concept, Viking Age childhood may have been more fluid; consisting of age-differentiated social thresholds. By exploring these social thresholds, this research hopes to illuminate Viking Age adolescence. Drawing on bioarchaeological, archaeological and literary research, adolescent health will be discussed as well the effect established gender roles had on this particular period in life. Was there a concept of adolescence or did children simply become adults?

Iwashiro, Kuninori [163] see Sugiyama, Saburo

**Izuho, Masami (Tokyo Metropolitan University), Kazuki Morisaki (Nara National Research Institute for Cultural Properties), Katsuhiko Sano (Tohoku University), Dai Kunikita (Hokkaido University) and Fumie Iizuka (University of California, Merced)**  
[120]

*Micro-regional Diversity in Subsistence Strategy during the Early Upper Paleolithic in the Southern Paleo-Honshu Islands*

The appearance of modern humans on the Japanese Archipelago dates back to 38,000 cal yr BP. The archaeological components of what is called the Early Upper Paleolithic (EUP) show some clear modern behavioral traits of *H. sapiens*. These include various types of standardized lithic tools, organized use of habitational sites and other spaces, as well as long-distance transport of artifacts and manuports via land and sea, strategic use of high-quality lithic raw materials, trap-pit hunting, and bow-and-arrow technology. The sudden emergence of EUP sites and apparent cultural homogeneity indicate a rapid dispersal of *H. sapiens* across different regions of the Japanese Archipelago. This suggests that the first modern human colonizers successfully adapted into various micro-biomes distributed across the islands from the sub-arctic north to the sub-tropic south, which were significantly different from their homelands in the Asian continent. Here we explore further the driver of colonization events across the micro-biomes in the southern Paleo-Honshu Islands by looking at demography, technology, subsistence, and ecology.

Jaijil, Roy [154] see Rissolo, Dominique

Jaime Tello, Cecilia Ysabel [192] see Silva, Jorge

**Jaimes Betancourt, Carla (University of Bonn) and Geraldine Fernandez (Universidad Mayor de San Andres)**  
[124]

*The Llanos de Moxos: Cultural Dynamics East of the Andes*

The Llanos de Moxos region, located between the Andean foothills and the Brazilian shield, plays an important role in understanding Andean-Amazonian interaction throughout time. Since the first centuries of our era, this region has been home to a great linguistic and cultural diversity, which maintained a flow of exchange of objects, technologies, and ideas with the societies that inhabited the Andean foothills. Depending on the geographical and social context, this dynamic influenced political, economic, and ideological aspects of the societies that actively participated in this process. This paper will focus on analyzing the fifteenth-century social panorama of the Llanos de Moxos and its relations and/or transformations originated by the Tawantinsuyo.

**Jaimes Betancourt, Carla (University of Bonn)**

[124]

Chair

James, Sydney [20] see Huang, Cindy Hsin-yee

**Jamsranjav, Bayarsaikhan (National Museum of Mongolia) and Julia Clark**

[99]

*The Mongol Empire Cemetery of Khorig: A Comparison of Xiongnu and Mongol Funeral Rituals*

Research on the tombs and cemeteries of Genghis Khan and his successors is of huge interest. Historians have noted the "Ikh Khorig" (The Great Taboo) and "Khorig" (The Taboo) the mysterious cemeteries where Chinggis Khaan and his descendants of the Mongol Empire were buried. During field study of the Mongolian-American joint "Northern Mongolia" project, a large cemetery of the Mongol aristocracy was discovered in 2017 on Khorig Mountain in the Darkhad Depression in Northern Mongolia. Unfortunately, the site was completely destroyed by looters. The most important result of this research discovery was that the cemetery of the aristocracy of the Mongol Empire was located on a mountain called Khorig, which is the name mentioned historical sources. The date of the cemetery is traced back to the twelfth and fourteenth centuries by artifacts and radiocarbon dating. The surviving finds, the location of the tombs, and the internal structure of the cemetery have brought many new results to the mortuary archaeology of the Mongol Era. This time, we present the continuity and similarity of funeral rites of the Mongol Empire and the Xiongnu Empire, based on the results of the salvage excavation at the Khorig Mountain site.

Jamsranjav, Bayarsaikhan [99] see Batsuren, Byambadorj

Jamsranjav, Bayarsaikhan [139] see Morgan, Christopher

**Janesko, Sarah (New South Associates) and Jessica Mundt (New South Associates)**

[12]

*Curating Exclusion in Perpetuity: Insight from Archaeological Records*

While there are efforts in archaeology to be more inclusive, the discipline has a history of excluding people and perspectives that do not fit a dominant narrative of the past. These exclusions show up in various ways within archaeological collections and archival records, from site names to field notes. This paper explores some of the ways in which documentation of sites and the process of archaeology can perpetuate harassment, offensive language, stereotypes, and negative work or learning environments. The paper examines why it is important to deconstruct practices that may be seen as innocuous or dismissed as outdated in order to identify how they potentially contribute to microaggressions and subtle forms of behavior that exclude certain groups from participating in the field or being a central part of the interpretation of a site. We argue that these historical instances of exclusion continue to be harmful through the archival and curation process, and we discuss ways that archaeologists can thoughtfully approach the curation of site records so as not to continue to exclude people from the process of archaeology.

Jantz, Suzan [66] see Niles, Erin

**Janz, Lisa (University of Toronto)**

[214]

*The Role of Pastoralism in Economic Stability and Sustainability: A View from Mongolia*

Diet choice is a major determinant in community health and a keystone of cultural tradition and economic structure. Since the mid-twentieth century, massive growth in the global diversity and availability of food has become a hallmark of economic development. This has created an increasing emphasis on societal- and self-regulation of diet. Discourse around diet includes scrutiny of traditional diets, the search for an ideal in healthy eating, concerns with animal welfare, and questions about sustainability. Recently, the crusade against red meat has taken center stage. Here, I argue that sustainability must be geographically and environmentally contextualized, with red meat often playing a crucial role in sustainable food production. I provide evidence for the deep economic importance of ungulates in Mongolia—from big game hunting in the Pleistocene to the Bronze Age introduction of cattle and caprine-based pastoralism—and demonstrate the critical importance of pastoralism to long-term resilience and sustainability by emphasizing ethnographic data illustrating the importance of pastoralism to ecological conservation and political stability. This regional case study emphasizes the critical nature of ungulate management and consumption in certain ecological settings and cautions against uncritical evaluation of data presented in the interests of marketing diet.

**Janzen, Anneke (Max Planck Institute for the Science of Human History)**

[107]

*Mobilities of Early African Pastoralists: Isotopic Approaches*

Mobility is one of the primary ways in which pastoralists cope with shifting climatic, ecological, and social circumstances. In part driven by the needs of livestock, movements may be seasonal to access high-quality pastures, or may involve longer-term residential mobility in response to shifts in environmental and social landscapes. Pastoralists also depend on extensive social networks to mitigate risks of herd losses. The development of food production in Africa followed a different trajectory than other parts of the world, with herding appearing long before sedentary agriculture. The importance of mobility among of modern pastoralists raises questions about how early herders used the landscape before the arrival of agriculture, and how these practices differed in the varying social and ecological contexts across the continent. Stable isotope analysis of archaeological livestock provides a unique perspective on the mobility practices of early herders, providing insight into seasonal and longer-term movements of cattle, sheep, goat, donkey, and the people that herded them.

Janzen, Anneke [203] see Burge, Keri

Janzen, Anneke [186] see Goldstein, Steven

Janzen, Anneke [203] see Ogden, Brigid

**Jaramillo, Sara (Stony Brook University), Katheryn Twiss (Stony Brook University), Anastasia Iorga (Stony Brook University) and Nicholas Gonzalez (Stony Brook University)**

[158]

*Measuring Fish Remains in Different Areas of Ancient Ur: A Possible Marker for Differentiation in Consumption*

Archaeologists have long relied on texts and iconography to build inferences about fish consumption in ancient Mesopotamia since little faunal information is available. Responding to this gap in knowledge, we summarize the distribution of fish remains in residential deposits from Ur in southern Iraq. We report the relative densities of fish remains in deposits associated with different households in order to evaluate potential differences in fish consumption during the city's Old Babylonian occupation. The analyzed remains were recovered via flotation from material collected during archaeological excavations conducted between 2015 and 2019. These aquatic animal remains from flotation samples will provide a more complete picture of animal use at Ur. The data presented here relate to existing conversations about social distinctions in Mesopotamian food acquisition and environmental exploitation.

Jarman, Nicholas [127] see Steffen, Anastasia

Jasiak, Caroline [113] see Ferrell, Morgan

**Jazwa, Christopher (University of Nevada, Reno)**

[47]

*Resource Defense and Environmental Change in Late Holocene Interior Santa Rosa Island*

On California's northern Channel Islands, environmental change during the Medieval Climatic Anomaly (~1300–650 cal BP) and population growth were associated with a restructuring of settlement distributions. This includes the depopulation of previously settled locations and the creation of buffer zones between large coastal villages. In this paper, I discuss the potential for similar resource defense in the interior of Santa Rosa Island, with a particular focus on Pocket Field near the west end, the largest flat area on the island. Radiocarbon dates indicate occupation of this region throughout the late Holocene (after 3600 cal BP), with sites distributed throughout the study area, but nearly all indicating relatively short periods of occupation. The presence of projectile points without any terrestrial game in the island interior indicates the potential for defense. By analyzing the chronology and distribution of sites and these artifacts, it is possible to understand the role of the island interior in resource use and mobility during a period of environmental change.

Jean, Ballagh [41] see Phillips, David

**Jean, Joseph Sony**

[44]

*A Material Heritage Turn for Narrating Haitian History*

Haiti's long, complex history is reflected in its material heritage—one of the richest in the Caribbean—which remains a crucial source of global knowledge. Many studies based on colonial archives have demonstrated the role of Haiti in shaping the modern world. However, archaeological sites, testifying to colonization's impacts, human forced displacement enslavement, resistance, and achieving freedom, is rarely used to narrate Haitian history. What narratives can emerge from studying the material past, and how a material turn can deliver more nuanced and critical narratives about Haitian history? This communication is based on the ongoing archaeological and heritage project initiated in 2014, aiming to broaden our understanding of the long-term Haitian landscape transformation and its palimpsestic heritage and memory. In this presentation, I will first address the Amerindian settlements and social organization in Haiti before the European colonization by highlighting, through archaeological data, how the European colonization has drastically changed their landscape. Second, I will discuss the long-term colonial strategies translated into urban and rural landscapes to sustain the colonial system. Finally, this presentation will critically address questions and perspectives to deepen the Haitian past by centering archaeological research as alternative ways to uncover untold stories.

**Jefferies, Richard and Mark Williams (University of Georgia, Emeritus)**

[12]

*Living in the Shadow of Legends: The Archaeological Legacy of Sheila K. Caldwell*

Often overshadowed by the accomplishments of her father, Arthur R. Kelly, and husband, Joseph R. Caldwell, Sheila Kelly Caldwell conducted archaeological investigations in Georgia from the early 1950s to the late 1970s. Sheila learned much of her archaeological expertise while working for her father in the late 1940s. She continued her archaeological work in the 1950s, often in consultation with her new husband. Foremost among Sheila's accomplishments was her work at Mission Santo Domingo de Talaje, the first professionally investigated Spanish mission site in Georgia. Despite the significance of her work, Sheila Caldwell remains relatively unknown in the annals of North American archaeology. Caldwell's mid-twentieth-century archaeological experiences are representative of many other women who pursued archaeological research in that era.

**Jenkins, Jessica (William & Mary)**

[119]

*A Tale of Two Tempers: Considering the Relationship of Pottery Temper and Identity during the Woodland Period on the Northern Gulf Coast of Florida*

The relationship between pottery and identity has long interested archaeologists, and it is often assumed that variations in the way pottery is made and used are indicative of social identities, communities of practice, and patterns of situated learning. In a study of 300 domestic Woodland period vessels from 12 sites in the Lower Suwannee region of Florida's northern Gulf Coast, formal and stylistic attributes are highly variable both within and between sites. The exception to this pattern is in temper, which appears to have been a somewhat geographically circumscribed technological choice. Sand and limestone are the two tempers that dominate Woodland period pottery assemblages, although spiculate wares are not uncommon. The long-standing association of place and temper (specifically sand vs. limestone) in the Lower Suwannee appears to have begun by at least the Early Woodland period when the area was resettled after it was seemingly abandoned after the Late Archaic. The initial resettlement appears to have involved at least two communities that inhabited islands on either side of the newly emplaced burial facility, Palmetto Mound (8LV2), on Hog Island: those who tempered their pottery with sand to the north, and those who tempered their pottery with limestone to the south.

**Jennings, Justin (Royal Ontario Museum)**

[89]

*Discussant*

Jennings, Justin [157] see Kellner, Corina

**Jennings, Thomas (University of Louisville), Ashley Smallwood (University of Louisville), Michael Waters (Texas A&M University), Joshua Keene (Baylor University) and Timothy Pertula (Archeological & Environmental Consultants LLC)**

[97]

*Golondrina in the Southern Plains: Exploring Affinities to the Dalton Horizon of the Eastern Woodlands*

Golondrina is an Early Holocene lanceolate point type recovered from sites in the Southern Great Plains and southwestern Plains periphery. Once thought to relate to the Plainview Plains Paleoindian tradition, Golondrina has also been linked to the Dalton tradition of the Eastern Woodlands. In this paper, we present a detailed analysis of the Golondrina assemblage from the Friedkin site, the largest Golondrina assemblage yet reported, and compare it to a recent reanalysis of the Baker Cave and Devil's Mouth assemblages. We then use morphometrics and cladistics to broadly compare a sample of Golondrina points to contemporary and antecedent lanceolate Paleoindian points. Through technological comparisons of tool production and morphological comparisons of point forms, we test the hypothesis that Golondrina is a late, western expression of the Dalton lanceolate tradition.

Jennings, Thomas [117] see Smallwood, Ashley

**Jensen, Anne (University of Alaska Fairbanks/Bryn Mawr College) and Anthony Krus (University of South Dakota)****[31]***Radiocarbon Dating the Birnirk and Thule Occupations at Walakpa, North Slope, Alaska*

The Walakpa archaeological site (49BAR013) located on the Chukchi Sea coast of Alaska's North Slope is the only archaeological site in the US Arctic with vertically stratified occupations spanning millennia. Excavations led by Dennis Stanford (1968–1969) revealed a 2 m thick stratified sequence with recent Inupiat through Thule to Birnirk contexts, overlying a layer with Arctic Small Tool tradition artifacts. Those excavations also documented a series of structures within the Thule and Birnirk levels. Due to severe and accelerating erosion, the area around the structures underwent salvage excavation in the 2010s, revealing an additional house. Samples retrieved from these recently excavated contexts were radiocarbon dated to reassess the timing of activity associated with the structures with a Bayesian chronological framework. At 95% probability, this analysis estimates that activity associated with the structures began in the tenth or eleventh centuries AD, while the final activity associated the structures ended in the fifteenth or sixteenth centuries AD. Overall, these results suggest the stratified structure complex was used continuously for 400–500 years, further supporting the view of Walakpa as a persistent place that spanned from the precontact period to the modern era.

**Jensen, Anne (University of Alaska Fairbanks/Bryn Mawr College)****[127]***Discussant***[31]***Chair***Jensen, Samuel (Brigham Young University), Michael Searcy (Brigham Young University) and Meradeth Snow (University of Montana, Missoula)****[176]***Redating Paquimé and the Convento Site 60 Years after the Joint Casas Grandes Expedition in Northwestern Mexico*

Debates continue regarding the rise of the Late Prehistoric (post-AD 1200) city of Paquimé in northwestern Chihuahua, Mexico. Unfortunately, the established chronology of the site was flawed due to incorrect interpretations of dendrochronological samples that lacked cutting dates (i.e., outer rings). While Dean and Ravesloot (1993) were able to determine this mistake through a reanalysis of the original chronological sequence, no attempts have been made to revise the chronology using new dates. This poster reports the results of new radiocarbon dates analyzed from samples of human remains found at Paquimé during the Joint Casas Grandes Expedition from 1958 to 1961. We also analyzed additional samples to revise the chronology of the Viejo period (AD 700–1200) site of Convento.

**Jerrems, William and Amy Dansie (Retired)****[105]***More Bits and Pieces: Twenty Years of Lahontan Basin Paleoindian Research*

A pre-Clovis entry into the Americas (pre-13,500 cal BP) apparently occurred across Beringia most likely by intermittent boat ventures along parts of the North American western coastline. The Yana Site (western Beringia) located above the arctic circle at 32,000 rcybp sets a potential trajectory for human entrance into North America (eastern Beringia). Bluefish Caves evidence humans in eastern Beringia at 24,000 cal BP. Ultimately settlements along the coastal route initiated a movement into the continental interior following the Columbia River, an area subject to the many devastating Missoula floods. Despite these floods, evidence of such a migration potentially as early as 16,000 cal BP exists at the Coopers Ferry site in central Idaho and Paisley Five Mile caves at 14,400 cal BP in the northern Great Basin. Focusing on the Lahontan basin of northwestern Nevada, we see evidence of a very early entrance into the interior lands of North America.

**Jerrems, William****[105]***Chair*

Ji, Jenny [148] see Alex, Bridget

Jiang, Rays [111] see Vianello, Andrea

Jiménez, Máximo [154] see Reeder-Myers, Leslie

**Jiménez Cano, Nayeli (Universidad Autónoma de Yucatán)****[63]***Back to the Future: Fish Exploitation in the Prehispanic Coastal Maya Lowlands of Yucatán*

Marine fisheries sustain the economies and welfare of coastal communities by providing food for more than three billion people worldwide. Tropical estuaries are some of the marine environments most highly threatened by climate change, ocean acidification, overfishing, and pollution. This research presents a synthesis of the dynamics in coastal exploitation practices along the northern Yucatán coast during periods of environmental stress, such as the transition from the Classic to the Postclassic. The effects of the droughts reported during the end of the Classic period on Maya coastal settlements have not previously been considered. Based on zooarchaeological analysis at coastal sites of the Northern Lowlands, the ecological and social implications of the droughts reported in the Terminal Classic are evaluated. The results show that environmental changes and anthropogenic pressures caused

fluctuations in the frequency of fish species, modification in the mean tropical levels, reduction in the size of fish caught, and changes in biogeography. In this sense, this work offers a contribution both to our understanding of Maya coastal exploitation and adaptations during episodes of climate change and to our understanding of modern fisheries in the region.

**Jiménez Osorio, Liana (Universidad Nacional Autónoma de México / Instituto de Investigaciones Estéticas)**

[123]

*Lugares y paisajes sagrados en los códices Mixtecos precoloniales*

Los lugares y paisajes sagrados en la Mixteca fueron fundamentales para la ejecución de rituales en pro del bienestar, éxito, toma de decisiones y legitimación de los gobernantes y nobles, asimismo, fueron venerados por la gente común en la época precolonial. Las representaciones de estos lugares en los códices mixtecos precoloniales dejan ver su relevancia, variedad y la existencia de santuarios tanto construidos como no construidos. Lamentablemente, durante la colonización muchos de estos lugares fueron destruidos y prohibidos por los frailes que buscaban erradicar la religión mesoamericana y evangelizar a las poblaciones originarias. Debido a esto y a que han sido poco estudiados desde la arqueología, no se sabe mucho sobre la conformación de estos lugares y paisajes. De tal forma, en esta plática abordaré estos lugares a partir de (1) sus representaciones en los Códices Mixtecos y (2) los santuarios precoloniales que he visitado o registrado como parte de proyectos arqueológicos. El objetivo es conjuntar las representaciones iconográficas y las materialidades para reimaginar estos lugares desde la dimensión del paisaje, la cual implica un involucramiento a partir de las experiencias vivenciales de sociedades pretéritas y contemporáneas.

**Jochim, Michael (Univ of California–Santa Barbara)**

[51]

*Discussant*

Joe, Mervin [140] see Goodwin, Rebecca

**Johansson, Lindsay**

[208]

*Who Is Fremont? Evidence for Clustering, Cohesion, and Community among the Fremont of the Northern Southwest*

During the Fremont period, groups in the eastern Great Basin aggregated into larger and more permanent settlements, and these settlements clustered together across the landscape. Within many settlement clusters, sites exist containing architecturally distinct buildings which were used differently than typical residential structures. Broadly, these distinct buildings can be divided into two types, central structures and oversized pit structures, both of which have some evidence of communal functions. Based on correlations between settlement clustering and buildings with communal functions, this paper argues that the organization of people into larger, more settled communities played an important role in Fremont daily life. Within these communities, activities taking place either in or in association with central structures and oversized pit structures as well as the architecture of some homes suggest the presence of leaders and increasing status differentiation among those living in the eastern Great Basin ca. AD 900–1200.

Johns, Virginia [215] see Lyons, Patrick

Johnson, Adam [126] see McCoy, Mark

**Johnson, Emily (UCSB), Alleen Betzenhauser (Illinois State Archaeological Survey) and Amber VanDerwarker (UCSB)**

[15]

*Nixtamalization and Culinary Traditions at the Ancient East St. Louis Site*

Nixtamalization is a cooking technique that plays a significant role in the foodways of Indigenous communities throughout the Americas. Boiling maize in an alkaline solution made from slaked lime or plant ash increases its nutritional value and helps to prevent severe malnutrition in maize-dependent populations. Maize became a significant part of the diet for American Bottom residents ca. AD 900, coincident with the appearance of a novel pottery form referred to as stumppware. The prevalence of white residue on stumppware suggests its role in processing limestone for use in nixtamalization. Additionally, some cooking jars have a visible ring (at the boil line) on their interiors suggesting their use in nixtamalizing maize. We looked for direct evidence of maize nixtamalization in the form of carbonate deposits and starch spherulites by performing archaeometric and experimental analyses of stumppware and microbotanical residue analysis of cooking jar sherds. The samples span the Terminal Late Woodland (AD 900–1050) through Mississippian (AD 1050–1400) occupations at Cahokia's East St. Louis Precinct, allowing us to directly investigate the creation and spread of maize foodways in the American Bottom and illustrate the utility of microbotanical analysis in answering complex social questions.

**Johnson, Matthew (Northwestern University)**

[100]

*Discussant*

Johnson, Norma [196] see Corbett, Debra

**Johnson, Peri (University of Illinois at Chicago) and Ömür Harmansah (University of Illinois at Chicago)****[183]***Hittite Imperial Policies and Urban Planning in the Western Borderlands*

The Yalbur Yaylası Archaeological Landscape Project's 2021 season of fieldwork focused on the comparison of two connected Late Bronze Age imperial urban foundations in the western borderlands of the Hittite Empire. Separated by three centuries, the differences in urban planning between the two foundations indicate the changing imperial policies between the expanding empire in the sixteenth and thirteenth centuries BCE. The sixteenth-century foundation is Kale Tepesi, located along a river gorge in the agricultural heartland of the area and on a principal east-west route. In 2021, the project documented the extant ashlar monumental architecture and water infrastructure within the city with subsurface geophysics prospection coupled with total station survey of architecture visible on the surface. The thirteenth-century foundation is Uzun Pınar, located across an agricultural plain from Yalbur Yaylası's thirteenth-century sacred pool with a monumental inscription commemorating a military expedition to southwestern Anatolia. Historically aligned with the inscription, Uzun Pınar's monumental complexes appear to have a military function and are built in roughly finished local stone that contrasts with Kale Tepesi's ashlar masonry. This paper explores the comparison of these two urban foundations further both in their architecture, urban planning, and changing borderland politics.

Johnson, Phyllis [206] see Estrada Aguila, Rebecca

**Johnson, Phyllis, Markus Eberl (Vanderbilt University), Charreau Bell (Vanderbilt University) and Jesse Spencer-Smith (Vanderbilt University)****[206]***Using Tiny Artifacts to Answer Big Questions: Microdebitage and Ritual Spaces at the Classic Maya Capital of Tamarindito*

Maya economies, especially those involving obsidian, have traditionally been understood as having been primarily controlled by the elites. At Tamarindito, however, over 75% of all the obsidian recovered was found within Group 5PS-d, a non-elite residential group on the outskirts of the site, which would have limited direct oversight from the royal center. Further, these artifacts were found within a structure whose architecture (which appears to have been designed with ritual production in mind) is unique at Tamarindito and throughout the Maya region. This begs the question: how were Classic Maya production systems organized, and who was involved in this production? To address this, the present study combines dynamic image analysis with machine and deep learning to the analysis of lithic microdebitage measuring between 0.5 and 4.0 mm to identify areas of ritual and domestic production at Tamarindito.

**Johnson, Phyllis****[206]***Chair*

Johnson, Phyllis [206] see Rieth, Amy

**Johnson, Rachel (Tulane University) and Jason Nesbitt (Tulane University)****[88]***Resilience and Risk in the Placement of Initial Period Coastal Centers*

During the second millennium BC, early ceremonial centers proliferated along the central and northern Peruvian coast. Recent scholarship has raised important questions about how they were affected by the El Niño phenomenon. In this paper, we present remote sensing imagery and flood modeling from different coastal valleys that suggest that the builders of these monumental sites placed them in hazardous locations, such as quebrada mouths, which were susceptible to catastrophic debris flows. We argue that the placement of these sites was intentional and related to cosmological beliefs that linked the powerful forces of nature with the ceremonial activities conducted at these temples. Therefore, it follows that to understand resilience requires scholars to consider perceptions of El Niño and the way it relates to Initial period ontologies among the cultures inhabiting the coast of Peru.

**Johnston, Susan (George Washington University)****[42]***Mobility, Meaning, and Identity in the Context of the Irish Iron Age*

The consensus understanding of Iron Age Ireland is that the settlement pattern was substantially mobile, but this characterization leaves a lot of room for more complex interpretations. On the one hand, it is worth questioning what this means—what does it mean to be mobile, what degree of movement is required for a society to be mobile, and are we sure we are always recognizing the evidence for mobility accurately in the archaeological record? At the same time, if society was mobile, how did individuals and communities interact to create shared identity, something indicated by various categories of archaeological evidence. These questions are considered in the context of the Irish ceremonial centers which emerged in this period. A new radiocarbon sequence from the site of Dún Ailinne and Whittle's concept of "tethered mobility" both form the backdrop of this analysis. These large centers provided both a place in which such identities could be experienced (for good or ill) and also suggest the kinds of identities which might have been explored and expressed.

**Jolie, Edward (University of Arizona)****[222]***Textile Impressions in California Archaeology: Analytical Considerations and Research Potential*

In the absence of exceptional preservation, data on ancient textile industries can be recovered from intentional and accidental negative impressions of woven products left in media that are plastic or pliable initially but that harden later. However, detailed study

of such textile impressions remains uncommon across much of the western United States. In California, where surviving organic artifacts are generally quite rare, impressions in asphaltum (bitumen) provide an alternative, complementary means of acquiring data on textile crafts that are increasingly recognized for their potential to contribute to essential questions about daily life, technological change, and social boundaries and identities. In this paper, I review the major analytical considerations attendant to impressions analysis and explore the underappreciated research potential of textile impressions. Drawing on recent results from the detailed analysis of assemblages of textile impressions in asphaltum from two sites in California, I offer methodological suggestions and review the salient interpretive inferences from these studies that stand to enhance the research potential of similar assemblages.

**Jolie, Edward (University of Arizona)**

[222]

Chair

**Jones, Catherine (University of Wisconsin–Milwaukee)**

[178]

Chair

Jones, Catherine [178] see Freire, Shannon

**Jones, Douglas, Melanie Damour (Bureau of Ocean Energy Management) and Jason Chaytor (US Geological Survey)**

[46]

*X Marks the Spot . . . for Now: Subsea Mudflows and Moving Shipwrecks on the Mississippi River Delta Front*

On May 12, 1942, the 500-foot-long, steel-hulled tanker Virginia was sunk by the German U boat U-507 off the Mississippi River's Southwest Pass. The shipwreck was discovered in nearly 300 feet of water during a 2001 oil and gas survey and was investigated by a remotely operated vehicle in 2004. A 2006 geophysical survey found that the shipwreck had moved more than 1,200 feet downslope in only two years. A 2017 survey by the US Geological Survey in collaboration with the Bureau of Ocean Energy Management found that Virginia had moved another 200 feet. The Mississippi River Delta Front is a highly dynamic environment prone to mudflow events triggered by hurricanes, winter storms, river floods, and other less-understood processes. Oil and gas infrastructure and submerged cultural resources in this area can be impacted by these events, and Virginia is not the only historic shipwreck that appears to be moving across the seafloor. This paper will address the challenges of managing submerged cultural resources that do not stay in one place and will discuss emerging questions, technologies, and future research opportunities to study this phenomenon.

Jones, Douglas [46] see Damour, Melanie

**Jones, Emily Lena (University of New Mexico)**

[207]

Discussant

Jones, Emily Lena [122] see Bethke, Brandi

Jones, Emily Lena [92] see Taylor, William

**Jones, Eric (University of South Carolina), Jordan Davis (University of South Carolina), Wyatt Fleming (University of South Carolina), Amber Wellings (University of South Carolina) and Kelli Hajek (University of South Carolina)**

[161]

*Social and Economic Landscapes of Dairy Farming in Madison County, NY, 1850–1950*

This research examines the relationship between farming practices, production amounts, and natural and cultural landscapes to describe the establishment of a rural dairy-farming community in the Town of Fenner, Madison County, NY, from 1850 to 1950. Over this time, this region became one of the primary dairy producers in the United States, built on family-run farms with herds of 50–200 cows. Around these farms, dispersed households and complementary businesses and services emerged. Since this time, the dairy industry has slowly declined and related businesses disappeared, as large corporate farms (1000+ cows) were established in other regions. Our primary goal is to describe and explain the nineteenth- and early twentieth-century landscapes and any changes that occurred prior to the corporatization of farming. To do this, we examined a combination of census data, agricultural schedules, industrial schedules, historic maps, business gazetteers, natural and built landscape features, and oral histories to describe farm activities, surplus production, and social and economic landscapes. Our broader objective is to show how archaeological research can help us understand past forms of the American agricultural political economy, how they compare to our current form, and how these forms relate to rural community survival and ecological sustainability.

Jones, Hillary [162] see Bies, Michael

Jones, Isabella [27] see Church, Jason

**Jones, KC (PaleoResearch Institute), Travis Jones (PaleoResearch Institute) and R. A. Varney (PaleoResearch Institute)**  
**[39]**

*Assessing Hydrofluoric Acid Digestion of Siliceous Clay Matrices and Its Utility in AMS Dating of Fiber-Tempered Ceramics*

The lack of stratified contexts and absence of organic remains in surface assemblages at early archaeological sites hinders our ability to create local chronologies and contextualize technological and socioeconomic changes. This research proposes an intensive method of directly dating fiber-tempered ceramics, which are often found in surface contexts in the southeastern United States. Direct dating of ceramic body sherds has been used when other organics like wood, charcoal, or plant macrofossils are not available for analyses. Late Archaic (5000–3000 cal BP) site destruction is so severe in the interior Coastal Plain of the southeastern United States that most of the archaeological record dating to this period has been erased from existence, leaving indiscreet surface scatters of artifacts separated from their original context. Direct dating of fibers, particularly Spanish moss (*T. usneoides*), in these Late Archaic organic-tempered wares is instead used in place of more traditional dating techniques. This study presents an experimental method of ceramic dating, using hydrofluoric acid (HF) to digest the silicate matrix of Late Archaic body sherds, leaving organic tempering agents like *T. usneoides* for AAA (acid-alkaline-acid) pretreatment and AMS dating. Preliminary methods and results are discussed, as well as future directions with this pretreatment technique.

Jones, Mica [186] see Brandt, Steven

Jones, Shelby [70] see Rowe, Marvin

Jones, Travis [39] see Jones, KC

**Jordan, Peter**

**[135]**

*Discussant*

**Joseph, J. (New South Associates), Jasmine Heckman (US Army Corps of Engineers) and Andrea Gregory (US Army Corps of Engineers)**

**[81]**

*From Mass Graves to New Lives: The Veterans Curation Program*

Dr. Michael "Sonny" Trimble's experience on the excavation of Saddam Hussein's mass burial sites in Iraq exposed him to the challenges the US military faced in the Iraq conflict and heightened his appreciation for the women and men of our armed forces. Returning to his role as Director of the US Army Corps of Engineers' Mandatory Center of Expertise for the Curation and Management of Archaeological Collections, Sonny, saw the opportunity to repay our military service members by seeking American Recovery and Reinvestment Act funding to establish a program that would employ veterans in the rehabilitation of archaeological collections. Now in its tenth year of operation, this paper reviews the operations of the Veterans Curation Program (VCP) and the benefits it brings to both military veterans and our archaeological heritage.

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

**[219]**

*Discussant*

**[81]**

*Chair*

Jovanovic, Tatijana [91] see Sherfield, Anne

Jovic, Jelena [2] see Zavodny, Emily

**Joy, Shawn (SEARCH Inc.)**

**[46]**

*Coastally Adapted: Developing Model for Coastal Paleoindian Sites on the Gulf of Mexico Continental Shelf*

Earth has experienced several phases of glacial and interglacial climates over the past 200,000 years. During these periods, sea levels were lower by as much as 130 m. The climate has been so weighted toward colder conditions, that 90% of human history has taken place during lower than modern sea levels. The reintroduction of freshwater into the oceans after the last glacial maximum radically changed global sea levels and littoral landscapes. Over the last 20,000 years, approximately 20 million km<sup>2</sup> of coastal landscape was submerged worldwide, an area roughly the size of South America. The inundation of these landscapes has created gaps in the history of humans directly interacting with the coasts. Using global coastal anthropological uniformitarianism, a model was developed for coastally adapted Paleoindian sites on the Gulf of Mexico continental shelf. Coastally adapted Paleoindian sites will not reflect the hallmarks of upland Paleoindian sites, with carefully crafted projectile points constructed from exotic lithic material, with megafaunal remains, at ephemeral campsites signifying high mobility. Instead, coastal Paleoindian sites will contain micro-blade and utilized flakes technology constructed from locally sourced lithic material in place of projectile points, with a subsistence strategy exclusively weighted toward marine resources.

**Joy, Shawn (SEARCH Inc.)****[46]***Chair*

Joy, Shawn [46] see Smith, Morgan

**Joyce, Arthur (University of Colorado at Boulder) and Sarah Barber (University of Central Florida)****[156]***The Power of Monumentality and Ruination in Prehispanic Oaxaca*

In this paper we consider the materiality of the Río Viejo acropolis in the lower Río Verde Valley, Mexico. Following new materialist theory, we examine the acropolis as an assemblage whose power emerged from the intensive flows assembled within its buildings. People were involved in these flows, but the acropolis could not have come together without the building materials, offerings, ancestors, and feasting foods whose relations activated emergent properties. The community that came together through the acropolis was therefore more than human. After the acropolis was closed during the Formative–Classic period transition, erosion and decay took over and intensified as forces affecting the buildings until people were once again drawn back. We argue that the reemergence of hierarchy in the Late Classic activated memories of rupture held in the acropolis that threatened and resisted new forms of community, demonstrating the power of the monument even in ruin, and which drew rulers back to appropriate that power through repair and reanimation. After the collapse around 800 CE the acropolis once again contributed to the transformation of community as common people were drawn to it, building modest residences atop its monumental platforms and once again making offerings.

Joyce, Arthur [13] see Barber, Sarah

Joyce, Arthur [154] see Hedgepeth Balkin, Jessica

Joyce, Daniel [66] see Sasso, Robert

**Joyce, Rosemary (University California Berkeley)****[156]***Being in Place: Subjectivities Shaped by a Honduran Landscape*

In this paper, I reflect on four decades of research in the lower Uluu River valley in northern Honduras, and how at a landscape scale we can understand the way human and nonhuman subjectivities were shaped over the long term. My work was encouraged by Wendy Ashmore at key moments. She opened the door for scholars to work as household archaeologists using survey methods in pursuit of answers to questions about agency and practice. This kind of work is consequential in the contemporary world. The Honduran landscape that I will describe has critical importance today because it was created and maintained for thousands of years as a more sustainable place than commonly imagined in our archaeological models. Understanding that societies in this tropical riverine environment contained efforts to increase inequality, while enjoying a way of life enriched by the benefits of skilled craft practice, helps counter narratives insisting that human societies always maximize power differentials. Establishing the emancipatory potential of archaeology is also something that Wendy Ashmore encouraged, making it possible for archaeologists like me to embrace the political significance of our discipline without giving up on our belief that we can understand the past through empirical research.

**Juarez, Santiago (Colgate University)****[225]***Cosmological Landscapes at Late Preclassic Noh K'uh in Chiapas, Mexico*

This paper focuses on how landscape transformations shaped and guided the development of an urbanizing society within a small valley in Chiapas, Mexico. The Late Preclassic (400 BC–AD 200) site of Noh K'uh demonstrates how both the altered and unaltered parts of this environment signified the importance of cosmological concepts within this society. In an area rich with mountains and caves, the natural landscape offered residents multiple opportunities to create symbolically meaningful living spaces. Although many forces are at work in the growth and development of a community, evidence from local settlements reveals how the cosmological universe played a guiding role during the site's peak growth period.

**Juengst, Sara (UNC Charlotte), Abigail Bythell, Emilie Cobb (High Point University), Zindy Cruz (UNC Charlotte) and Richard Lunniss (Universidad Técnica de Manabí)****[193]***Sand, Stone, and Sea: A Mortuary and Bioarchaeological Investigation of Identity and Ontology at Salango, Ecuador (BCE 100–300 CE)*

(Bio)archaeologists have attempted to “unlock” the identities of past peoples using multiple lines of evidence but have been limited by the application of modern salient demographic categories. In this paper, we discuss and compare successive Very Early Guangala (BCE 100–1 CE) and Early Guangala (1–300 CE) phase burials located near the north perimeter of Salango, a shoreline site and ritual sanctuary serving multiple communities of the central coast of Ecuador. Very Early Guangala individuals of different ages, with a predominance of infants, were accompanied by stone figurines and marine shells in extended and occasionally atypical configurations in low mounds carefully constructed from distinct layers of sand and clay. Early Guangala burials were located in the same area but without funerary architecture, and were all adult, generally seated and endowed with a different set of goods. Given the shifting mortuary practices, these burials provide an opportunity to access the ontology of the Salango ritual sphere, questioning categories of gender, age, and the boundaries of agency. We combine multiple methods of analysis, including mortuary

archaeology, paleopathology, and dietary and strontium isotope analysis, in order to explore the varied and intersectional identities these individuals may have had.

**Juengst, Sara (UNC Charlotte)**

[193]

*Chair*

Juengst, Sara [38] see Cobb, Emilie

Junco, Roberto [46] see Horrell, Christopher

Juptner, Derick [108] see Soares, Justin

**Jurado, Alexander and Tatsuya Murakami (Tulane University)**

[13]

*Shifting Practices and Institutions of Governance in Formative Central Mexico*

Governance is a broader concept than government, which allows for an in-depth analysis of the socio-material forces that shape governing structures. It operates at multiple geographic and institutional scales, meaning it needs to be contextualized in specific socio-spatial assemblages. In this paper we examine the process of governance at settlement and macroregional scales in Central Mexico during the Middle Formative period (1000–500 BCE). We argue that polycentric, macroregional structure was a means for establishing and perpetuating specific traditions of governance at the settlement level. This very structure was also responsible, in part, for the decline of each settlement. Our research suggests temporal and geographic disruptions occurred around 700–650 BCE between an earlier Morelos-Guerrero tradition associated with Olmec style and the later Central Mexican urban tradition, which persisted through the Classic and Postclassic periods. Transformations in governance structure likely accompanied this disruption. The trajectory of governance in Central Mexico contrasts with eastern Mesoamerica, where Olmec carving styles and its associated ideology persisted after 700 BCE.

Jursky, Adam [172] see Watkins, Tia

Kahn, Jennifer [168] see Escue, Claudia

Kahn, Jennifer [160] see Watson, Caroline

**Kaldahl, Eric (Amerind Foundation Inc.)**

[165]

*Discussant*

**Kalush, Amber (SUNY University at Buffalo)**

[184]

*Memory and Histories in Archaeology*

Using theories about memory and refusal, this paper will look at the trackways at White Sands National Park to inform our ideas about the past and what role we have in preserving them into the future. These trackways are simultaneously being uncovered/discovered and being erased, and different methods are being used to record and remember them. What is the role of the archaeologist in interpretation and preservation, and what is the role of local Indigenous memory and histories? As archaeologists work to fit these trackways into our existing scientific frameworks, Indigenous people have their own histories and explanations which should also be prioritized. How do we respect Indigenous voices in terms of what they would like to be done (or perhaps more importantly not done) for future work, preservation, and publication about their past?

Kamenov, George [2] see Zavodny, Emily

**Kamp, Kathryn (Grinnell College)**

[17]

*Discussant*

**Kamp-Whittaker, April (University of New Mexico)**

[113]

*Digital Archaeology through StoryMaps*

The University of Denver Amache Project partnered with CAST at the University of Arkansas on a SPARC Grant to develop an ArcGIS StoryMap about the history and archaeology of sports at the Granada Relocation Center National Historic Landmark (Amache), a World War II Japanese American incarceration center. The ArcGIS StoryMap allows the DU Amache Project to draw on the relative strengths of existing GIS maps and our OCHRE Database to create a public facing interpretive tool. Archaeological

data from excavation and surface survey was combined with extensive oral historical and archival data to share the story of sports as a tool for community creation and resilience.

**Kangas, Rachael (Florida Public Archaeology Network), Sara Ayers-Rigsby (Florida Public Archaeology Network) and Michael Savarese (Florida Gulf Coast University)**

[127]

*Using Climate Stories and Computer Modeling Tools to Assess the Vulnerability of Cultural Resources in Southwest Florida*

Climate change is impacting cultural resources that provide an invaluable sense of place to local communities. Unfortunately, the impacts to historical sites are rarely at the forefront in the minds of developers and resiliency professionals. In 2017, Dr. Peter Sheng, of the University of Florida, and Dr. Michael Savarese, of Florida Gulf Coast University, began development of a web-based interactive decision support tool for the Adaptation of Coastal Urban and Natural Ecosystems (ACUNE) in Collier County, Florida. Input from numerous stakeholders, including cultural resource managers, was integral to the creation of the tool. In 2021, a vulnerability assessment focusing on the impacts of climate change to cultural resources was prepared using the ACUNE tool. The authors engaged with local stakeholder groups including the NAACP, land managers, and others to seek out important resources that may not have been documented on the NRHP. The resulting document provides a quantitative overview of the impact of various sea level scenarios across the county, but also uses 10 case studies of properties identified by stakeholder groups as climate story vignettes. The combination of qualitative research with stories of local sites presents a powerful picture of the future of climate change and heritage.

Kaniuth, Kai [157] see Göhring, Andrea

**Kansa, Eric (Open Context / UC Berkeley)**

[72]

*Chair*

Kansa, Eric [72] see Edmonds, Mackenzie

Kansa, Eric [72] see Wells, Joshua

**Kansa, Sarah (AAI / Open Context)**

[36]

*Moderator*

[36]

*Discussant*

Kansa, Sarah [122] see Lau, Hannah

**Kantner, John (University of North Florida)**

[51]

*It's Not All Ritual: Understanding the Religion of Chaco Canyon*

One of Mark Aldenderfer's many contributions to archaeology is in the reconstruction of past religion—with an emphasis on what religion does, an explicit departure from religion as ritual, and a flexible and pragmatic approach based on an exploration of archaeological contexts, contrasts, and combinations. This study applies this perspective to Chaco Canyon in the US Southwest. Evidence of ritual abounds in the archaeology of Chaco, from ritual architecture such as great kivas to landscape features such as roadways, all of which suggest periodic pilgrimage events in the AD 900s and AD 1000s. Less often discussed, however, is the religion underlying these rituals. A detailed examination of one class of artifacts associated with Chaco Canyon—in this case, fossil shells—shows how Aldenderfer's approach can uncover previously unrecognized elements of Chacoan religion.

Kaplan, Emily [155] see Smit, Douglas

Karacic, Steven [65] see Rainville, Charles

Karakostis, Fotios [187] see Falcucci, Armando

**Kardulias, Drosos (Ohio State University)**

[93]

*Medieval Roman Fortifications on an Aegean Island: GIS Analysis of the Kastron of Kalymnos, Greece*

Amid the reversal of fortunes suffered by the seventh-century Roman Empire, study of the shifting political landscape has passed only lightly over one of the Arab-Roman conflict's key frontiers: the Aegean Islands. The islands bear the marks of warfare and societal upheaval both in their histories and landscapes. The island of Kalymnos has a largely untapped potential to inform an understanding of Roman-Arab warfare in the periphery. This poster examines the Roman kastron of Kalymnos to elucidate the dynamics of the island's fortification scheme as a component of the empire's defensive strategy. GIS analysis of four Roman

fortifications on Kalymnos reveals a wealth of information about the ancient inhabitants' responses to conflict, including priorities of topographic selection, degrees of autonomy/influence from the broader Empire, significant battlefield dynamics, and tactical aspects of community self-defense. GIS methodology such as viewsheds, cost-path analyses, etc., are contextualized within the principles of contemporary warfare. This study has implications for the maintenance of imperial hegemony through the self-preservation actions of subjects, threat responses in insular communities, the ways in which communities can survive cyclical violence, and the tactical details of a civilian populace's response to armed incursions.

**Kardulias, P. Nick (College of Wooster), Konstantinos Trimmis (University of Bristol), Stavros Paspalas (University of Sydney), Lita Tzortzopoulou-Gregory (Australian Archaeological Institute at Athens) and Timothy Gregory (Ohio State University)**

[67]

*Quartz Artifacts from Kythera, Greece, and Human Migration in the Aegean during the Paleolithic*

Permanent occupation on Mediterranean islands did not occur until the Neolithic, but a growing body of evidence demonstrates human presence in the preceding Paleolithic and Mesolithic. In the Aegean region, the discovery of Acheulian style stone tools on Crete spurred investigations that have identified Paleolithic remains on other islands, including Naxos, Zakynthos, Kefalonia, and Lesbos. This material has raised questions about the nature of hominin dispersal into the Mediterranean and Europe. One way to think about this spread is by means of "bridge" islands that lie close to continental shores, followed by excursions to more isolated pelagic locations. Survey work on Kythera, lying just south of the Peloponnese, has recovered an assemblage of quartz artifacts from the Koupharika-Krotiria site with similarities to material found in Paleolithic contexts on other islands. A cleaver and scraper bear a strong resemblance to quartz tools from Plakias in southwestern Crete that have been dated to the late Lower Paleolithic. These recent discoveries by the Australian Paliochora-Kythera Archaeological Survey add another location that may have been visited by humans in the Pleistocene. The location of Kythera suggests a possible route by which people migrated from the Greek mainland to western Crete in this early period.

Karkanias, Takis [16] see Goldberg, Paul

**Kasper, Kimberly (Rhodes College), Mary Catherine Brown (Rhodes College), Olivia Evans (Rhodes College), Chiara Torrini (Rhodes College) and Jamie Evans (Ames Plantation)**

[161]

*Brick by Brick, Nail by Nail: Reconstructing Nineteenth-Century Enslaved African and African American House Structures in Western Tennessee*

This poster investigates the recovered architectural materials from enslaved African and African American houses at the Fanny Dickins and Cedar Grove plantations in western Tennessee. Since 2011, the Rhodes College Annual Environmental Archaeology Field School has focused its excavations on the enslaved African and African American house sites to learn more about the daily lives of the enslaved individuals within these plantations. Through analysis of nails, bricks, window glass, and other architectural materials, we will compare the types of houses and explore whether the house structures at each site deteriorated in situ or were repurposed to create other structures. This research provides insight into the specific function of architectural materials and post taphonomic processes. In addition, this comparative approach will allow us to build on existing data about the daily lives of enslaved people in the nineteenth century, especially relating to the accessibility of architectural resources and house maintenance.

**Kassabaum, Megan (University of Pennsylvania) and Anna Graham (University of North Carolina, Chapel Hill)**

[49]

*Public Works or Private Spaces? Considering Mound-and-Plaza Centers in the American Southeast*

Mound-and-plaza centers were a common form of monumental architecture in the eastern United States from around 3500 BC until European contact. While the scale, form, and function of these spaces varied greatly over this 5,000-year history, their monumental nature has led scholars to consistently emphasize their role in the public sphere. At the same time, certain site layouts and mound summit areas have been highlighted as evidence for the creation of private, restricted zones within these spaces. This variability has led to mound-and-plaza sites being discussed as vacant ceremonial centers, public monuments, communal gathering places, restricted-access locations, private elite spaces, etc. In this paper, we review these past interpretations and how they relate to factors such as site age and layout, sociopolitical organization, and patterns of summit and plaza use. We also examine the degree to which the emphasis on the public or private nature of a particular site is determined by the theoretical leanings of the interpreting archaeologist. Finally, we explore how the physical spaces themselves as well as the social processes of constructing and using them created overlapping, intermediate communities and thus defy classification as strictly public or private.

**Kater, Thiago (University of São Paulo), Fernando Ozorio de Almeida (Rio de Janeiro State University) and Cliverson Pessoa (University of São Paulo)**

[25]

*From Colonizers to Colonized, from a Polychromic Cultural Unity to Fragments of Resistance: The Long-Term History of the Tupi-Guarani Peoples on the Upper Madeira River, Southwestern Amazonia*

Historical linguistics suggests that the Tupi common ancestral language originated somewhere in the upper Madeira River basin in Amazonia, where it began to branch approximately 5,000 years ago into one of the most widespread language stocks of South America. From these origins, the speakers of the Tupi-Guarani language family undertook broad population movements, beginning during the first centuries CE and spreading rapidly through the South American lowlands beyond the time of the European invasion. During the precolonial period, this movement involved multiple strategies, resulting in assimilation or displacement and migration of culturally distinct peoples, a phenomenon which included the disruption of a multi-cultural system which operated in the Upper

Madeira by the end of the first millennium CE. The rapid establishment of sites with characteristic polychrome ceramics is one of the archaeological hallmarks of this process. At the beginning of the colonial period Tupi-Guarani speakers adopted varying strategies of resistance and interaction vis-à-vis European colonizers, from warfare to alliance, confederation to isolation. From archaeological data, ethnohistory and ethnography, our aim is to present an historical overview of the *longue durée* of the Tupi-Guarani peoples who have inhabited the Upper Madeira and their relations of alterity and predation toward different “others.”

**Katz, Jared (University of Notre Dame)**

[128]

*Images of Sound: Music in Ancient Maya artwork*

Dr. Karl Taube's work has emphasized the importance of music in a variety of cultures throughout ancient Mesoamerica and in groundbreaking ways. From identifying the mythological origin story of music in the Codex Borgia to emphasizing the role that music played in the paradisiacal realm of ancestors, Flower World, Taube's work has paved the way for other researchers to continue the discussion on the imagery of music. This paper will explore the ways in which we can use imagery and artwork to discuss the soundscapes of ancient Maya peoples. As noted by Taube, music is often symbolically represented as a precious material, such as a chain of flowers. As a precious and highly regarded art form, the study of music deserves attention and this paper will draw on both ongoing scholarship and museum exhibitions. By analyzing the settings in which musicians are depicted and the types of musical instruments they are shown performing, we can better understand the soundscapes and lived experiences of ancient Maya people. This talk will also discuss the continued impact that ancient Mesoamerican musical practices continue to have on artists and musicians today.

**Katz, Jared (University of Notre Dame)**

[211]

*Discussant*

**Katz, Steven (Global Archaeological Consulting), Addison Kimmel (University of Iowa), Marcus Lewis (Ho-Chunk Education Department) and Elizabeth Wilk (Global Archaeological Consulting)**

[140]

*Archaeological Collaboration in Practice*

Archaeologists have an obligation to conduct research that is relevant and responsive to the desires, interests, values, and concerns of Indigenous descendant communities. Current best practices for collaborative, community-based archaeologies emphasize long-term engagement and “full collaboration,” including the co-production of knowledge and total stakeholder involvement. The present-day structures and demands of archaeology—especially in CRM and graduate student research contexts—can serve to make such fully collaborative work difficult if not impossible. Oftentimes, these difficulties result in a complete abdication of collaboration or even consultation beyond the bare minimum required by law. However, professional archaeologist must strive in all instances to work alongside Native communities in respectful, responsive, and mutually beneficial ways even if this work may often fall short of the loftiest ideal. In this paper, the authors present two case studies from the American midcontinent that demonstrate how this kind of “middle-range” collaboration can help us move toward a more ethical, inclusive, and respectful archaeology in the future.

Kaufmann, Cristian [85] see Belardi, Juan

Kavich, Gwenaelle [117] see Gingerich, Joseph A. M.

**Kawa, Nicholas (Ohio State University)**

[148]

*Who Gets to Be an Author in Anthropology?*

More than ever, there is pressure in academia to publish early and often. But hidden in the well-worn cliché that one must “publish or perish” is the question of whose academic labor is considered worthy of authorship in the first place. Many anthropologists work in collaborative research teams and most anthropologists rely significantly on the labor of others in the research process, but there is a general lack of established norms in the discipline regarding how determinations of authorship are made in developing research publications. So, who gets to be an author and who doesn't? And how do questions about authorship—from simple inclusion (or exclusion) to author order—expose problems within anthropological knowledge production that have become defining features of the discipline and its training? This paper aims to raise discussion around these questions of authorship in contemporary anthropology while specifically examining: (1) variation in criteria for authorship in anthropological subfields, (2) the erasure of some forms of labor alongside the exaggeration of others, and (3) how status influences identification of authorship and scholarly legibility.

Kaya, Deniz [38] see Conly, Caitlin

Kealy, Shimona [120] see O'Connor, Sue

**Keating, Ann (North Central College)**

[182]

*Discussant*

**Keehner, Steven (University of Iowa)****[119]***Temporal Ceramic Developments and Social Dynamics during the Woodland Period in the Eastern Central Plains*

Until recently, context-specific chronologies for ceramic developments among Woodland period (2500–1000 BP) communities in the eastern Central Plains have been problematic, or lacking entirely. To complicate understandings about regional material culture and social developments even further, archaeologists today must address the legacy of untested assumptions about people in the region that were put forth nearly three-quarters of a century ago. These theories portrayed Woodland communities in the region as migrants from the Eastern Woodlands, or the receivers of stylistic and ritual practices through the process of diffusion from Eastern Woodland groups often referred to as the Hopewell. As part of an ongoing project to test such legacy models based on hyper-diffusion, migration, and world systems theory, new AMS radiocarbon dates obtained from samples of ceramic charred-food residues from two sites in eastern Kansas—Perry (14JF315) and Infinity (14MY305)—will be presented alongside a larger suite of regional AMS dates to test models of information exchange and migration among communities in the region. By focusing on potters and their material culture practices, the project is providing a more accurate understanding of ceramic developments, social dynamics, and group identities during the Woodland period in the eastern Central Plains.

**Keene, Joshua (Baylor University), Michael Waters (Center for the Study of the First Americans) and Elton Prewitt (Texas Archaeological Research Laboratory)****[213]***Spear and Now: An Updated Projectile Point Chronology for Central Texas from the Hall's Cave Site (41KR474)*

The Hall's Cave site, located in Kerr County, TX, was initially identified as a paleontological site. However, later investigations identified the presence of stone tools and other lithic debris in alluvial cave deposits, as well as on the surface around the cave entrance. Recent geoarchaeological work has identified a well-dated depositional record in the cave dating from the Last Glacial Maximum to the late Holocene, with human habitation from ~10,500 cal yr BP to the historic period. The archaeological evidence indicates repeated, short-term periods of human occupation evidenced by over 60 well-preserved hearth features associated with diagnostic projectile points in distinct stratigraphic units separated by episodes stability during climatic periods with less alluvial deposition. This site provides an ideal setting to update the geochronology for 13 diagnostic point types from central Texas. It further provides a means for comparison and approximate chronological estimates for the extensive surface lithic assemblage outside of Halls Cave, on which recent surveys have mapped hundreds of diagnostic points and thousands of formal tools in discrete, largely undisturbed concentrations. Ultimately, this study focuses on diachronic variation in prehistoric forager site preference and use of the cave and the surrounding landscape throughout the terminal Pleistocene and Holocene.

Keene, Joshua [97] see Jennings, Thomas

**Keevil, Trevor (Purdue University), Sarah Coon (Purdue University), Melissa Torquato (Purdue University), Jacob Harris (Arizona State University) and Erik Otárola-Castillo (Purdue University)****[40]***Who Killed the Mammoth? Applying 3D Geometric Morphometrics, Deep Learning, and Bayesian Inference to Identify the Cause of Bone Surface Modifications*

Over 37 large mammal species went extinct in North America during the Late Pleistocene, including all proboscidean species. Generally, archaeologists model this extinction event as the result of either human hunting, climate change, or a combination of both. Some proponents of human overkill point to bone surface modifications (BSM) on proboscidean bones, such as cut marks, as evidence of past humans overhunting megafauna. However, others question the credibility of qualitative studies that differentiate human butchery marks from other BSM, such as carnivore tooth scores. This study uses high-resolution 3D laser scanning, deep learning, geometric morphometrics, and Bayesian inference to reassess possible human-induced BSM on the Mud Lake proboscidean skeleton. The shape of these archaeological marks was compared to experimentally generated BSM from modern butchery trials, controlled chopping and farm plowing experiments, carnivore feeding studies, and ungulate trampling experiments. Initial results indicate that the Mud Lake BSM are similar in shape to human-induced BSM, such as chop marks, and nonhuman BSM, such as carnivore tooth marks. These results may suggest that multiple archaeological agents consumed this mammoth, further complicating our interpretations of who or what caused the extinction of North American megafauna.

Keevil, Trevor [40] see Coon, Sarah

Keevil, Trevor [40] see De La Puente-León, Gabriela

Keevil, Trevor [40] see Denker, Erika

Keevil, Trevor [40] see Otárola-Castillo, Erik

**Kehoe, Alice (Retired scholar)****[171]***Moderator*

Keim, David [54] see Cap, Bernadette

**Kelley, Alice, Ana Mauricio (Pontificia Universidad Católica del Perú) and Daniel Sandweiss (University of Maine)**  
[88]

*Building for Protection: Check Dams and El Niño in the Chao Valley, Peru*

El Niño-triggered floods and debris flows can be devastating in north coastal Peru. Recent work in the lower Chao valley encountered a number of check dams (up to 4 m tall) extending across quebradas topographically above the Late Pre-ceramic to Initial period Salinas de Chao site. Ranging up to 20 m long, these features are constructed of sand and cobble fill encased by subangular rocks identical to the local bedrock. Currently, the upslope side of the walls are filled with debris flow material. Existing archaeological remains attest to the efficacy of the dams, with damage limited to water carved channels from minor dam breaches. Excavations at the Salinas de Chao site show clay floors over debris flow-like material, suggesting that the walls may have been constructed later in the site's occupation as a reaction to earlier flow events. Larger walls of similar construction were also identified nearby. While younger, large hazard-mitigation walls have been identified in region, the recognition of the Salinas de Chao check dams indicates that earlier populations addressed El Niño-related debris flows through construction projects. Additionally, the presence of these features suggests that check dams may exist in similar settings, but have not yet been identified.

**Kelley, Alice**

[127]

*Discussant*

Kelley, Alice [88] see Mauricio, Ana

**Kellner, Corina, Justin Jennings (Royal Ontario Museum), Willy Yopez Alvarez (Royal Ontario Museum) and Frank Ramos (New Mexico State University)**

[157]

*Benefiting from New Interaction Spheres during the Middle Horizon in Ancient Peru at Tenahaha (AD 850–1050): Merging Strontium Isotope and Archaeological Data*

The Middle Horizon (MH; AD 500–1000) in the ancient Andes saw the rise of new social, political, and ideological networks, spurred in part by the rise of two powerful states: Wari and Tiwanaku. While many analyses have centered state power in MH interactions, societies emerged that benefited from these networks outside of direct state control. The population at Tenahaha, a Wari-influenced ritual center in the Cotahuasi Valley of south-central Peru (AD 850–1050), experienced a population surge, social stratification, and increasing foreign influence during the MH. New strontium data from human tooth enamel ( $n = 16$ ) of juveniles and adults buried in various tombs across the site suggests that Wari emissaries did not migrate to Tenahaha (range = 0.706895–0.707097). These new analyses dovetail with previously analyzed archaeological data showing that Tenahaha was relatively peaceful during this tumultuous time and copied Wari ceramic iconography and architecture to profit from Wari's ideological cachet. Tenahaha may have succeeded in aligning themselves with new, popular ideologies and interaction networks without sacrificing local control. Migration and the ability to opt out of direct state control was likely more variable in the past as modern-day societies can successfully negotiate these interactions. Funding from NSF#0630081.

**Kelly, Jamie (Field Museum), Eli Suzukovich III (Field Museum and Northwestern University) and Lauren Fitts (Illinois State Archaeological Survey)**

[164]

*Chicago Area Collections at the Field Museum*

From surface finds to excavated collections, the Field Museum cares for thousands of archaeological items from the Chicago area. This includes material collected by Albert Scharf, who is known for his early twentieth-century map of Native American trails and villages of the Chicago area. In 1929, the University of Chicago undertook excavations at the Huber site in Cook County, Illinois. Later in the 1930s and 1940s, students from the University undertook fieldwork at the Robinson Reserve site in Cook County. Elaine Bluhm from the Field Museum continued with salvage excavations at the Huber site in the 1950s. Material from these excavations at both sites is housed at the Museum. This paper summarizes the history of these archaeological collections and their impact on recent studies and descendant communities including the Hoocak, Myaamia, Kickapoo, Kaskaskia, and Potawatomi.

Kelly, Lucretia [15] see Stauffer, John

**Kelly, Robert (University of Wyoming)**

[149]

*Discussant*

Kelly, Robert [97] see Kilby, David

Kelly, Robert [97] see Mackie, Madeline

Kelly, Robert [198] see Veres, Matthew

**Kelsey, Brady (University of Connecticut), Evan Wilson (CUNY; NYCEP), Elisabeth Hildebrand (Stony Brook University) and Steven Brandt (University of Florida)**

[90]

*Diachronic Changes in Late Pleistocene Ochre Technology at Mochena Borago Rockshelter, SW Ethiopia*

Excavations of the Late Pleistocene levels at Mochena Borago Rockshelter in SW Ethiopia, dating >50–35 ka, have revealed one of the densest concentrations of modified ochre in eastern Africa. Here we consider technological variation in ochre and associated

processing tools through studies of use-wear, elemental signatures, and artifact spatial distributions. Excavations in the shelter's central area have uncovered >1.5 m of stratified deposits >50 ka, containing more than 3,000 artifacts including flaked and ground stone artifacts, as well as >500 ochre pieces weighing nearly 5 kg. The ochre is associated with light to heavy concentrations of technologically diverse stone artifacts ("Modes 3–6"). The ochre also displays considerable technological variability, with the greatest variation occurring in strata that may date to late MIS 4–early MIS 3. Common ochre-processing techniques include 'rubbing' ochre against soft materials and powder-extraction of ochre against harder materials. These along with other ochre technologies are described within an "artifact life-cycle" framework as it relates to technological variability. Understanding ochre technological variability, and probing its functional and aesthetic implications, will help broaden discussions of behavioral changes in early human hunter-gatherer populations prior to and during their "successful" migration through and out of Africa after 60 ka.

Kelsey, Brady [90] see Wilson, Evan

**Kemmerlin, Aspen (Georgia State University)**

**[114]**

*Exploring the Possibilities of Active Learning through Collections-based Archaeology Courses*

Recent trends in archaeological pedagogy include the adoption of active learning models as well as courses that incorporate community and public archaeology frameworks. These shifts have primarily been centered around archaeological field schools and on-campus excavations. In contrast, despite the growing concern over legacy and orphaned collections that contribute to the "curation crisis," less attention has been placed on the potential for inquiry-based learning in lab or collections-based courses, particularly at the undergraduate level. Utilizing ethnographic methods, this study examines undergraduate experiences in introductory archaeology courses at Georgia State University (GSU). Located in downtown Atlanta, GSU is one of the largest institutions of higher education in the USA and its student body is one of the most diverse. Comparing student experiences in a traditional lecture course with those of students enrolled in a hands-on project lab with a legacy collection of archaeological material curated at the university, this poster explores the potential of lab-based courses as sites of active learning and as models for more inclusive and accessible archaeological education at higher education institutions. This study indicates that there are significant opportunities to utilize legacy collections in experiential courses that provide students with the requisite skills for professional archaeology.

Kemp, Kassie [127] see Miller, Sarah

Kemp, Leonard [114] see Mauldin, Raymond

Kemp, Melissa [179] see Rabinowitz, Adam

**Kendall, Bryan (University of Iowa Office of the State Archaeologist)**

**[52]**

*Natural Stratigraphy of Joy Creek Major (13PM7) and Surrounding Areas*

Geological coring of the valley bottom surrounding Joy Creek Major (13PM7) has been implemented to identify the depositional and pedological processes acting on the location and to develop a model of how these processes shaped the valley through time and affected the way this location was experienced by the occupants of 13PM7. Joy Creek Major was originally described as a mounded midden which was leveled to construct a nearby levee. The site is now situated on an early to middle Holocene terrace landform with sufficient accretional deposition to largely prevent or erase fine soil structure development. One buried stable terrace surface was identified just north of 13PM7 at a present depth of 1.5 m and a calibrated age of ca. 3900 BC. A lower late Holocene terrace is located just south of 13PM7, suggesting a major stream (possibly the Big Sioux River) was experiencing significant downcutting at this time. This late Holocene stream channel eventually eroded the southern extent of 13PM7 subsequent to occupation. The area surrounding 13PM7 is blanketed by historic alluvium further muting the visibility of the Joy Creek Major midden.

Kendall, Bryan [113] see Lange, Ryan

**Kennady, Nic**

**[21]**

*Living and Dying during a Pandemic: An Archaeological Comparison of the Influenza Pandemic of 1918 to COVID-19*

Pandemics not only cause mass death and suffering, but strip people of the daily habits and cultural traditions they would otherwise turn to for comfort. In the fall of 1918, the H1N1 influenza A virus, erroneously nicknamed the Spanish Flu, forced a world just emerging from the devastation of the First World War into the deadliest pandemic of modern history. Just over 100 years later, the COVID-19 pandemic brought the world to a grinding halt. Multiple technological, medical, and scientific breakthroughs separate the early twentieth century from the early twenty-first in the United States, and thus affect cultural responses to these pandemics. This study uses historical data, content analysis, bioarchaeology, interviews, and contemporary archaeology practices to explore similarities and differences in the ways in which these two pandemics disrupted the daily lives of people in the United States, focusing on San Francisco and Philadelphia.

Kennedy, Kendra [24] see Wescott, Konnie

**Kennett, Douglas (UC Santa Barbara) and Jeffrey Ross-Ibarra (UC Davis)****[151]***Maize Domestication and Dispersal in the Americas***[WITHDRAWN]**

Kennett, Douglas [51] see George, Richard  
 Kennett, Douglas [120] see Hixon, Sean  
 Kennett, Douglas [47] see McCool, Weston  
 Kennett, Douglas [14] see Plog, Stephen  
 Kennett, Douglas [153] see Prufer, Keith  
 Kennett, Douglas [47] see Ray, Erin  
 Kennett, Douglas [216] see Rosenswig, Robert  
 Kennett, Douglas [26] see Trask, Willa  
 Kennett, Douglas [154] see Voorhies, Barbara

Kentta, Robert [131] see Connolly, Tom

**Kerns, Christopher****[127]***Digging in against the Rising Sea: Nearly Two Centuries of Archaeological Intervention at Orcadian Neolithic Sites*

Archaeology is perpetually endangered by both human actions and environmental factors. This has led to the implementation of legislative frameworks and public policies that have often encoded the contradictory cultural values associated with identifying, investigating, and preserving archaeology. The threat of coastal erosion, and its impact on the Neolithic sites in Orkney has been a catalyst for archaeological research and intervention, for nearly two centuries. Over that time, Orcadian archaeologists have responded to this threat by implementing survey, excavation, preservation, and monitoring programs. These programs have been an inspiration for similar programs worldwide. Histories of the practice of archaeology in Orkney provide insight into the effectiveness of implementing various programs in response to the threat of coastal erosion. Further, by examining sites dating to the Orcadian Neolithic, we can simultaneously examine how people in both the past and present respond to changing sea levels. Finally, it is clear that programs similar to those implemented in Orkney could benefit other areas of the globe suffering from rising sea levels and coastal erosion. Effectively implementing such programs abroad requires a deeper understanding of local values surrounding archaeology along with an understanding of how such programs have emerged in other contexts.

**Kessler, Nicholas (University of Arizona)****[215]***Timing of Cliff Dwelling Construction in the Arizona Transition Zone: A Sinagua Study*

Cliff dwellings abound among the Early Classic and Pueblo III occupations of the Arizona Transition Zone. However, only in a minority of cases is the chronology of cliff dwelling construction known with precision. This is problematic since multiple models have been proposed to explain the proliferation of these structures with little resources for testing them. This paper summarizes the chronologies of cliff dwellings in the Verde Valley, Mogollon Highlands, and the Tonto and Safford Basins, and highlights scholarship on their origins and social functions. Then, new tree-ring-radiocarbon dates at Montezuma Castle National Monument in the Verde Valley are presented. The focus will be on the surprisingly early construction date, and an argument for wider application of contemporary tree-ring-radiocarbon chronometry in the Southwest.

Key, Alastair [76] see Bebbler, Michelle  
 Key, Alastair [187] see Eren, Metin  
 Key, Alastair [20] see Mika, Anna  
 Key, Alastair [187] see Mukusha, Lawrence

**Kidwell, Jasmine (Baylor University) and William Hockaday (Baylor University)****[115]***Molecular Analysis of Late Pleistocene-Holocene Transition Sediments from Blackwater Locality No. 1, New Mexico*

Numerous studies document the environment of the pond at Blackwater Locality No. 1, the Clovis-type site, in eastern New Mexico. Almost a century of archaeological, geological, and climatological research tells the story of a Late Pleistocene spring-fed watering hole initially characterized by flowing springs and streams, which transitions to a pond with a blocked outlet channel during the Folsom occupation, later reduced to a marsh, and finally, blanketed by eolian deposits as effective moisture decreased throughout the Holocene. While the pond's phytoliths, diatoms, stratigraphy, and archaeological constituents have been well studied, molecular analysis of the complex sediments comprising this robust site matrix remains to be completed. While rehydrating some sediments collected from the outlet channel in 2015, a strong, organic smell akin to a stagnant pond emanated from the sample. Using these same sediments, this study investigates the organic matter composition using <sup>13</sup>C nuclear magnetic resonance and gas chromatography-mass spectrometry techniques, with the goals of (1) quantifying the bulk molecular composition to understand the extent of organic matter preservation/decomposition and provide a basis for the interpretation, and (2) understanding the context and changes in the biomarkers and molecular proxies in sediments associated with Paleoindian occupation spanning the Pleistocene-Holocene transition.

**Kikuchi, Yuriko (Institute for Advanced Studies on Asia, University of Tokyo)****[158]***Circulation of Vietnamese, Chinese, and Japanese Coins in Early Modern Vietnam*

In each Vietnamese dynasty, round coins with a square hole were minted and used, while Chinese and Japanese coins also circulated domestically. Coins were the main import items in the Lê dynasty warlord period, whether in northern or central Vietnam and were initially brought by Japanese merchant ships. After the Tokugawa Shogunate's isolationist policy began in 1635, Chinese merchants or the VOC took over as the carriers. From the 1660s to the 1670s, there came to be a massive influx of coins from Japan. This presentation provides the archaeological research results on the hoards (mass discovery of coins) discovered in northern and central Vietnam. And based on the scientific analysis results of the discovered Vietnamese, Chinese, and Japanese coins, I will examine the circulation of coins used during the Le Dynasty warlord period.

**Kilby, David (Texas State University), Charles Koenig (University of Wyoming), Marcus Hamilton (University of Texas San Antonio), Madeline Mackie (Weber State University) and Robert Kelly (University of Wyoming)****[97]***Reconsidering Early Paleoindian Use of Rockshelters in Central and Southwest Texas*

Paleoindian components are often noted to be conspicuously absent from caves and rockshelters, despite early expectations in the search for "Early Man" sites in the American West. Early Paleoindians in general, and specifically the Clovis and Folsom technocomplexes initially defined on the Plains, are known primarily from open sites. Bonfire Shelter, Texas, thus stood out as an anomaly when 1960s excavations revealed *Bison antiquus* remains associated with Folsom and Plainview points; however, utilization of the shelter itself may have been incidental to the use of the canyon rim above as a bison jump. Recent work in the Lower Pecos Canyonlands (LPC) focuses on better understanding the deposits in Bonfire Shelter, as well as two newly identified early Paleoindian components in nearby Eagle Cave. Additional early Paleoindian components are known from Kincaid Shelter and Horn Shelter to the east of the LPC. Unlike Bonfire Shelter, these rockshelter occupations do not appear to be incidental to other behaviors and instead reflect use of shelters for residential activities. Together these sites suggest that the early Paleoindians of southwestern and central Texas may have behaved differently than their Plains contemporaries by more regularly using rockshelters for both subsistence and domestic activities.

Kilby, David [116] see Koenig, Charles

Killick, David [41] see Stephens, Jay

**Kim, Jangsuk (Seoul National University)****[135]***Discussant***[WITHDRAWN]****Kim, Lynn (University of Texas at San Antonio)****[124]***A Terraced Landscape: Coca Relationships in the Camata-Carijana Valley*

The Camata-Carijana valley is situated on the eastern frontier of the Inka Empire in the Kallawaya domain and was inhabited by Yunga groups from the tropical piedmont. To assess the relationships between these groups, the socioeconomics of agriculture production was examined through (1) the distribution of different terrace types, (2) ethnohistorical documents, (3) stable isotopes, and (4) palynology. The data demonstrates that the focus has been on coca production since ancient times. Indeed, coca shaped the local Yungas relationship with the Inka State and influenced Bolivia's position in modern global economics. While the inhabitants supported the Inka by providing and overseeing tributes of coca, they also maintained their own avenues of production, trade, and exchange. The Yunga people continued to negotiate their role during the Spanish colonial era. To this date, they navigate their identity as indigenous, traditional coca producers.

Kim, Sora [157] see Palefsky, Gina

Kimmel, Addison [140] see Katz, Steven

**King, Adam (SC Institute of Archaeology and Anthropology), Terry Powis (Kennesaw State University), Kong Cheong (American University), George Micheletti (University of Central Florida) and Nilesh Gaikwad (Gaikwad Steroidomics)****[18]***Exploring Non-food Residues in Ritual Cache Vessels from the Ancient Maya Site of Pacbitun, Belize*

The field of absorbed residue studies continues to expand in its use of secondary metabolites to explore questions not related to foodways and subsistence practices. Among those questions are ones examining ritual practices through non-food concoctions or sacred beverages. In this paper, we present the results of an absorbed residue study of pottery vessels recovered from ritual caches at the ancient Maya city of Pacbitun in Belize. We focus on the detection of a set of ingredients known to have been included in ancient Maya sacred beverages using multiple biomarkers for each ingredient. The caches span the Middle Preclassic through Terminal Classic periods and were found in contexts suggestive of centering, other dedicatory, and termination rituals. Despite the broad temporal span and diversity of contexts, each of the vessels contained the same set of biomarkers, revealing the presence of

cacao, chili, vanilla, and datura. The overall consistency of ingredients suggests ritual containers were used to consume a standard set of concoctions throughout Pacbitun's history.

King, Adam [89] see Skaggs, Sheldon

**King, Eleanor (Howard University)**

[156]

*Peopling Maya Places*

If one had to summarize Wendy Ashmore's contributions to archaeology in a single phrase, it might be that her greatest gift was to people past landscapes with human actors. From her seminal settlement studies at Quiriguá to her more recent musings on the role of the earth, sky, and water in prehispanic Maya landscapes, her thinking continually evolved to focus ever more sharply on the living people who once transformed these places. This paper offers an appreciation of that line of thinking, visible in many contributions to this symposium, and extends it to explore Maya marketing behavior. Maya economies varied not only through time but also across space, as people in different regions adapted differently to their surrounding environmental, geographical, political, and cultural situations. The palimpsest left on the landscape by their activities reflects these differences and gives us insights into how people in a specific region organized themselves economically. This paper considers that evidence for the eastern part of the Three Rivers Region in Northwest Belize and compares it to data from other Maya regions. It then infers what the similarities and differences among regions might tell us about the people who once moved across this landscape.

**King, Eleanor (Howard University)**

[188]

*Chair*

**King, Stacie (Indiana University)**

[123]

*Discussant*

King-Pedroso, Natalie [27] see Gaines, Alisha

**Kingrey, Haden (University of Nevada, Reno) and Geoffrey Smith (University of Nevada, Reno)**

[57]

*Residue Analysis of Early Holocene Groundstone from the Little Steamboat Point-1 Rockshelter (35HA3735), Warner Valley, Oregon*

The Pleistocene–Holocene Transition was a time of considerable environmental and technological change in the northern Great Basin. People adapted by seeking new modes of subsistence, and many researchers long assumed that an increased reliance on low-ranked seeds processed using groundstone tools was one such shift. Recently, some researchers have started to reconsider the role of groundstone in archaeological assemblages and demonstrated that such tools were used to process a range of plant and animal foods. The Little Steamboat Point-1 rockshelter in Warner Valley, Oregon, provides an opportunity to explore groundstone use at the end of the early Holocene. The site contained a robust early Holocene cultural deposit that included many groundstone tools and leporid bones but few economically important seeds. To determine the tools' use(s), the working surfaces of 73 manos and metates from early Holocene contexts were subjected to starch grain and protein residue analyses. These methods promise to provide a better understanding of when, how, and why Indigenous groups adopted groundstone and allow us to evaluate long-standing assumptions about diet breadth and the role of seeds in traditional subsistence regimes.

**Kinkopf, Katherine (Cal Poly Pomona)**

[100]

*Moderator*

**Kirk, Scott, Amy Thompson (University of Texas at Austin), Chung-Ching Shiung (National Cheng Kung University) and Christopher Lippitt**

[78]

*Building in New Lands: Monumental Religious Architecture as a Proxy for Historic Settlement Development in Taiwan, Louisiana, and New Mexico*

Historical narratives for colonization often center on settlements that are visible in the present, with archaeological investigations focused on the "historic districts" of big cities and/or extant architectural remains that have been completely abandoned. Comparatively less research has emphasized the importance of small towns and urban sprawl typically assumed to be more recent. In response to this potential bias, the Historic Settlement and Urbanization Project (HSUP) investigates how the foundational dates of standing monumental religious architecture (MRA)—churches, temples, etc.—articulates with historic settlement and urban development. Using pilot data collected on over 1,100 MRAs from Taiwan, Louisiana, and New Mexico, we demonstrate how our approach can be used to identify patterns in colonial settlement across disparate regions between the sixteenth and eighteenth centuries and processes of urbanization thereafter. We then compare results from the late nineteenth and early twentieth centuries to historic maps as a means of accuracy assessment. This study provides a foundation for future research focused on changes in community identity, power, and human behaviors through time.

Kirk, Scott [170] see Balco, William

Kirkley, Samantha [190] see Moe, Jeanne

Kirsten, Bailey [92] see Tornquist, Gabrielle

Kistler, Logan [22] see Ellis, Marina

**Kite, Tiffany (Washington State University)**

**[18]**

*Using Metabolomics to Gain a Deeper Understanding of Cultural Use of Yaupon Holly (Ilex vomitoria) and Cacao (Theobroma cacao)*

Metabolomic-based studies have opened the potential to expand residue analyses of caffeinated beverages beyond the shared biomarkers caffeine, theobromine, and theophylline. Experimental work allowed us to dive deeper into the phytochemistry of cacao (*Theobroma cacao*) and yaupon holly (*Ilex vomitoria*) establishing a reference database for each chemical signature. Using these studies as background, our latest tests look at questions of diagenesis and provenience of chemical residues in ceramics. Experimental Ilex artifacts were created in 2010, 2015, and 2020. We analyzed the rim, wall, and base of brewing vessels separately. Comparative information on cacao is available thanks to genomic research identifying 10 different populations. We analyzed representative samples from five of these populations to assess if genetic differences translate to the metabolomic level thus allowing for a more nuanced perspective of domestication and diffusion processes based on archaeological findings.

Kitterman, Anya [24] see Duke, Daron

Kitterman, Anya [24] see Wiktorowicz, Conner

**Klarich, Elizabeth (Smith College)**

**[10]**

*"Stunning Vistas, Wonderful People, and Very Cool Archaeology": An Introduction to the Contributions of Mark S. Aldenderfer*

We are gathering in this two-part symposium to celebrate the career of Professor Emeritus Mark S. Aldenderfer. The aims of this introductory paper are twofold: to provide an overview of the papers that follow and to share personal reflections as a former graduate student, a project collaborator, and fellow Andean archaeologist. Taken together as a group, these papers first reflect the broad geographical extent of Aldenderfer's field research, which began in the Maya lowlands and has extended to high elevation environments on nearly every continent. Second, the diversity of datasets presented—from archaeometry to regional satellite imagery to 3D replicas—is a testament to the highly interdisciplinary nature of Aldenderfer's personal research, collaborative work, and mentoring over the decades. Third, the contributors utilize a diversity of theoretical perspectives in the following case studies, reflecting Aldenderfer's ongoing engagement with, and appreciation for, the dynamism and breadth of anthropological archaeology. Lastly, I conclude with some insights into Aldenderfer's personal and professional legacy in the Lake Titicaca basin of Peru, a region characterized by its "stunning vistas, wonderful people, and very cool archaeology."

**Klarich, Elizabeth (Smith College)**

**[10]**

*Chair*

Klarich, Elizabeth [87] see Stanish, Charles

**Klassen, Sarah (University of British Columbia), Tiago Attorre (Flinders University), Phakdey Phin (National Authority of Preah Vihear), Samnang Phin (National Authority of Preah Vihear) and Alyssa Loyless (National Authority of Preah Vihear)**  
**[181]**

*Updates from the Koh Ker Archaeological Project*

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

**Klassen, Sarah (University of British Columbia)**

**[218]**

*Chair*

Klassen, Sarah [218] see Fletcher, Roland

Klehm, Carla [122] see Davis, Dylan

Klein, John [119] see Rankin, Caitlin

**Klemmer, Amy (University of Wisconsin–Milwaukee)**

[85]

*Reimagining Research and Community Engagement Using 3D Modeling of Osteological Comparative Collections*

Zooarchaeological studies involving bone identification require access to comparative collections. In an ideal world, access is hands-on and in-person. The worldwide pandemic presents major methodological challenges to zooarchaeological research, particularly when regular travel abroad is necessary. Travel restrictions, lock-downs, and general public health uncertainty affect both researchers and cultural heritage communities. Disparities in vaccine access create new ethical considerations for in-country research abroad. Though these challenges can cause major disruptions to research, they also present opportunities to engage with heritage communities in creative and innovative ways. In this presentation, I discuss a methodological approach using 3D modeling of reference collection specimens at the Salango Research Center (SRC) on the central coast of Ecuador and employing local community members as image capture specialists. This ongoing project combines a modest investment in technological infrastructure, the potential for open-access archiving of osteological images, and collaboration with the local heritage community, important stakeholders in regional archaeological research.

**Klemmer, Amy (University of Wisconsin–Milwaukee)**

[85]

*Chair*

Klemmer, Amy [3] see Hudson, Jean

**Klessig, Barbara (Humboldt State University / University of Exeter)**

[136]

*Integrating Archaeological Textiles into Mainstream Archaeology/Anthropology Curriculum*

The study of textiles has a lower profile in archaeological research than many other artifact classes. Possible reasons include the current and past devaluation of women's work and/or the relative rarity of this find-class. This presentation looks at how textiles could be better integrated into the teaching of archaeology at universities, as a step toward joining the mainstream. To accomplish this, educators must emphasize the importance of textiles to the next generation of archaeologists and researchers, what should be included in primarily textile focused courses, how archaeological textile studies can be incorporated into other courses, and how textile studies can fit into the goals of your university/department/course structure/teaching style/research focus/curriculum. Most of us do not think of where the textiles we wear every day came from, how they were created and the technology that goes into creating textiles for our use. Textile studies, both modern and ancient, can provide us with a better understanding of traditional craft production, the technologies and tools that go into the creation of textiles, how textiles fit into trade, exchange and commerce studies, and the role of textiles as cultural/societal indicators. Key words: Textiles, archaeology, technologies, trade, exchange, commerce, cultural/societal indicators, textile tools

**Klessig, Barbara (Humboldt State University / University of Exeter)**

[70]

*Chair*

**Klokler, Daniela (Universidade Federal de Sergipe [UFS]), Bruno Maximo (Universidade Federal do Amazonas [UFAM]), Luis Symanski (Universidade Federal de Minas Gerais [UFMG]) and Gina Bianchini**

[154]

*The Little-Known Shell Sites from Guinea-Bissau: Archaeology of the Diola People*

This paper aims to bring to light the recent insights from our project focusing on shell sites located in the mangroves of the Cacheu region, in Guinea-Bissau. Coordinated by Bruno Pastre Maximo, who has been studying the area since 2019, the research mapped a series of previously unknown sites. Contact with the communities demonstrates that many sites are still under construction and have distinct functions for the Diola. Our intention is to better comprehend the building of Cacheu's landscape, centering the attention on shell sites, their functions/uses, their material culture and integration with the neighboring mangrove and villages (*tabankas*). Shell sites epitomize the close relationship between the Diola ancestors and mangrove environments, and their disposition along the limits of the swamp in many *tabankas* indicates the liminal aspect of these structures. Also, through the use of phytolith analysis we wish to detect the presence of African rice (*Oryza glaberrima*) within these sites and contribute to the discussion about the origin and chronology of its domestication and utilization.

**Knell, Edward (California State University, Fullerton)****[83]***Allometry of Unifacial Flake Tools from Mojave Desert Terminal Pleistocene / Early Holocene Sites: Implications for Landscape Knowledge, Tool Design, and Land Use*

This study evaluates the allometry of terminal Pleistocene-Early Holocene age unifacial flake tools in the northcentral Mojave Desert of California to reveal linkages between landscape knowledge, tool design, and land use. Analyses of 438 unifacial flake tools (all types) show that at the population scale Mojave Desert Paleoindians, like other post-Clovis Paleoindians across North America, possessed good knowledge of their landscape and designed flake tools for short-term (expedient) purposes. This design strategy repeats in three study areas but to varying degrees: flake tools in the Fort Irwin study area were designed for shorter-term use than those from the pluvial China Lake and Lake Mojave study areas. Chert flake tools were designed for somewhat shorter-term use than those made from fine-grained volcanic stones, with obsidian flake tools designed for long-term use. The regional ubiquity of knappable lithic raw materials, especially cherts, partially explains the short-term design strategy given Paleoindians' knowledge of the landscape, including where to find knappable stones. Given that the design strategy of unifacial flake tools varies by raw material type, it provides a reminder that Great Basin Paleoindian land use models derived solely or largely from obsidian projectile points and bifacial tools may result in biased interpretations.

**Knisley, Matthew (University of Chicago)****[6]***Discussant***Knobloch, Patricia (Institute of Andean Studies)****[189]***Middle Horizon Players on the Wari Stage: Experimenting with Authority in the Andean World*

In bottom-up perspectives on Middle Horizon Wari expansion, large units of analysis (valley surveys, architecture, pottery styles) are being refined with smaller units (rural sites, households, bioarchaeology data). This paper focuses on small units of analysis, individuals, usually depicted on tapestries, effigy jars, or painted urns. Artifact images of men and women are likened to historic photos that can reveal one's personality and agency. As such, the images are referred to as agents that are numbered and being compiled by the author and generous contributions from accommodating colleagues in an online database: Who Was Who in the Middle Horizon Andean Prehistory (<https://whowaswhowari.sdsu.edu/>). An agent may represent an individual or ethnicity. As the Wari tested their authority with strategies of contact and conquest, agent analysis will map the evidence of participation as the building blocks to hegemony. Agent combinations can indicate either confrontations that infer conflict or cooperation that suggest partnerships, fictive kinships, or allegiances. Non-Huari origins of agents will be identified. Their depictions on Huari artifacts reveal Wari's more cosmopolitan engagement. But were they visiting friends? Captured foes? Like Shakespeare's players, these agents "have their exits and their entrances" as the Andean world exited regional autonomy and entered imperialism.

**Knoerlein, David****[81]***Digital Photography: From Mass Graves to the VCP*

From 2004 to 2007 at the direction of Sonny, David Knoerlein developed, implemented, and controlled a complete forensic imaging system that was utilized to manage documentation of evidence for the mass graves investigations in Iraq. Sonny wanted high-quality images that would tell the horrific story of the victims. This was no small task considering the environment and the fact that we were in a war zone. When the photography equipment ordered never arrived and had to be reordered, that didn't stop Sonny. He ordered all the team members to turn over their personal cameras to be used until the new equipment arrived. He was instrumental in the development of what is now the trademark methodology utilized in all the VCP labs for photographing artifacts as if they are evidence. After Iraq Sonny tasked Mr. Knoerlein with developing and managing the same style of forensic imaging systems for the VCP. From day one of the beginning of the VCP every veteran technician and lab manager in the program are trained to use the same basic forensic photographic style created in Iraq. I learned early on if Sonny asked if you could do something, he really means make it happen.

Knudson, Kelly [157] see Gonzalez La Rosa, Luis Manuel

Knudson, Kelly [157] see Palefsky, Gina

Kobayashi, Makoto [9] see Whitlock, Bethany

Koch Madsen, Christian [114] see Nielsen, Michael

**Koenig, Charles (University of Wyoming), Madeline Mackie (Weber State University), David Kilby (Texas State University), Tressa Munger (University of Wyoming) and Charles Frederick (University of Texas)****[116]***Evaluating the Integrity and Origins of a Clovis Age Assemblage from Eagle Cave, Texas*

Early Paleoindian components in rockshelters are rare, and late Pleistocene sheltered sites associated with proboscidean remains are rarer still. Recent excavations by Texas State University in Eagle Cave, Texas, identified a late Pleistocene archaeological component containing the fragmented remains of a subadult mammoth (cf. *Mammuthus columbi*) located stratigraphically beneath a

dense Younger-Dryas occupation. In association with the mammoth bones are approximately 100 pieces of lithic debitage, a large cluster of rocks, and additional faunal remains of a juvenile bison (*Bison antiquus*). No diagnostic artifacts were recovered, but bracketing radiocarbon dates indicate this component dates from ~12,600–13,300 cal BP. Here we present ongoing analyses evaluating the integrity and origins of this component including (1) stratigraphic integrity, (2) zooarchaeology and taphonomy, (3) spatial patterning of lithic artifacts, (4) geomorphology, and (5) Bayesian age modeling. Our analyses indicate late Pleistocene foragers transported portions of a mammoth into Eagle Cave. Although we lack diagnostic artifacts, the association between proboscidean remains and cultural material dating to approximately 13,000 cal BP suggests this assemblage is Clovis.

Koenig, Charles [97] see Kilby, David

Kohler, Timothy [47] see Bird, Darcy

**Kohut, Lauren (Bowdoin College), Ryan Smith (University of Pittsburgh), Elizabeth Arkush (University of Pittsburgh) and Steven Wernke (Vanderbilt University)**

[9]

*Landscapes of Conflict across the South-Central Andes: An Interregional View of Hillfort Distribution and Variation through Systematic Imagery Survey*

Hilltop fortifications in the Andean highlands, known as *pukaras*, are widespread features during the Late Intermediate period (1000–1450 CE) and Late Horizon (1450–1532 CE). While *pukaras* have been documented in several regions, our understanding of the extent of warfare and range of defensive practices has been limited by the small scale and discontinuous coverage of traditional field research projects (survey and excavation). Through systematic visual survey of satellite imagery covering over 100,000 km<sup>2</sup> in the circum-Titicaca Basin and several provinces of southern Peru and northern Bolivia, our team documented more than 1,200 *pukaras*. This research represents the largest, systematic survey of *pukaras* in the Andes to date. In this paper we present preliminary results from this remote survey, which was conducted as part of GeoPACHA. After summarizing the general characteristics of the dataset, we highlight several regional clusters of *pukaras* to discuss patterned variation in defenses. The results of our survey demonstrate both the vast distribution of *pukaras* across the southern highlands and the diversity in defensive architecture and settlement patterns at interregional scale.

Kolak, Tatjana [2] see Zavodny, Emily

**Kolar, Miriam (Amherst College)**

[211]

*Moderator*

**Kolb, Charles (National Endowment for the Humanities, Retired)**

[133]

*Discussant*

**Kolbenstetter, Marie (Leiden University / Université Paris Nanterre) and Alexander Geurds (Leiden University / University of Oxford)**

[154]

*Why Do We Need “Mangrove Archaeology”?*

Mangrove wetlands are widely recognized for the various roles they play in the preservation of coastal environments. The maintenance of these fragile ecosystems relies on the balanced relationships between water, land, vegetation, and animal life. But what are human histories of participation in this delicate balance? With present-day anthropogenic landscape modifications threatening mangrove forests globally, understanding the past roles of humans in the maintenance of mangrove ecosystems is becoming a pressing question. The boundary position of mangroves at the intersection of land and sea situates these environments at the edges of theoretical and methodological frameworks. As a result, archaeological work on these transitional environments is regionally scattered and methodologically diverse. This paper, and the wider symposium of which it forms part, will be a first attempt at conceptualizing what “mangrove archaeology” can be and why it is necessary to combine and compare past and current studies of human-mangrove relationships. It will further discuss possible future avenues of research, invoking a growing body of archaeological research that explores wetlands, intertidal environments and riparian settings that recognizes the unique dynamics brought about by “amphibious environments,” both in past human practices and contemporary archaeological work.

**Kolbenstetter, Marie (Leiden University / Université Paris Nanterre)**

[154]

*Chair*

Koldehoff, Brad [119] see Miller, G. Logan

**Kollaard, Jelissa (Trent University) and Laure Dubreuil (Trent University)****[191]***Functional Variation within Middle Paleolithic Ground Stone Tools: Use-Wear Analysis of Ad Hoc Limestone Tools from Units I–II at Neshar Ramla*

The exceptional assemblage of ground stone tools (GST) recovered at Neshar Ramla presents a unique opportunity to gain a more comprehensive understanding of GST function and human behavior during the Middle Paleolithic in the Southern Levant. Hundreds of predominantly ad hoc limestone cobbles were distributed throughout multiple phases of occupation, dating to the Mid to Late Middle Paleolithic (MIS 6–5). This study employs use-wear and residue analysis to interpret the function of cobbles from the upper sequence (Units II-I), characterized by a trend of decreasing density for several artifact categories. Analysis of this upper sequence will also provide data for exploring diachronic changes in the function of GST at the site. Results from Unit V already indicate some level of functional variability. This paper details experimental use-wear data, which define diagnostic wear patterns for different tasks and processed materials. We also present preliminary results of the analysis of a portion of the GST and argue that the limestone cobbles from Units II–I, like those from Unit V, were employed to process a variety of materials. Our results highlight the importance of GST at Neshar Ramla, even within the context of decreasing site use intensity toward the last phases of occupation.

**Kollias, George (Brandeis University)****[104]***Political Boundaries and a Varied Landscape on the Usumacinta*

This paper explores the impact of polity conflict and territoriality on settlement patterning, and the roles of sub-royal elites and rural communities in the production, and reproduction, of political territories. The borders and frontiers of ancient communities can tell us as much about a polity as the central seats of authority which govern them. This is particularly evident in the Maya lowlands, where an array of competing political structures vied for control over the landscape. The ancient polities of the Usumacinta River region provide an excellent case study for the exploration of sociopolitical organization, territorial control, and inter-polity conflict. Considering epigraphic data detailing intergenerational conflicts persecuted by competing polities in the Usumacinta basin and adjacent valleys, I examine the landscape between the sites of Lacanja Tzeltal and El Cayo, Chiapas, Mexico. Here, a unique confluence of social and environmental factors created a political frontier where communities adapted a karstic, mountainous landscape to their defensive benefit. This presentation investigates this frontier through the lens of epigraphic materials, which detail prolonged inter-polity conflict and GIS based analysis of Lidar data.

**Kolpan, Katharine (University of Idaho)****[2]***Debating Sarajevo's Old Jewish Cemetery: Jewish Historical Space or Commemorative Monument to Bosnian War Tragedy?*

The Old Jewish Cemetery in Sarajevo (also known as the Spanish Cemetery, or Kovačići Cemetery) is one of the oldest and largest Jewish cemeteries in Europe. It encompasses four centuries of Jewish history and includes a type of grave marker found nowhere else. However, the Old Jewish Cemetery also holds a particular place in the narrative surrounding the 1992 Siege of Sarajevo, a 3.5-year blockade that severed the city from the rest of Bosnia and Herzegovina (BiH), in which the cemetery served as an artillery position and a notorious sniper's nest. The shelling, as well as return fire from the city below, heavily damaged the cemetery, including its monuments to Holocaust victims. It has since been demined, but the damage to the gravestones and monuments has never been repaired. Instead, it is used as an instructive tool to teach mostly tourists about the Siege. This presentation focuses the ongoing discussion regarding how the material culture and memory of Sarajevo's Old Jewish cemetery should be commemorated. Is it a place of Jewish history? A way to remember a vibrant, but currently numerically diminished, ethnic group? Or is it a place of wartime suffering? If so, whose suffering and from which war?

Kolvet, Renee [226] see Simmons, Alan

Konsoer, Kory [127] see Watt, David

**Koons, Michele (Denver Museum of Nature & Science), Lisa Trever (Columbia University), Hugo Ikehara (Metropolitan Museum of Art) and Alicia Boswell (University of Santa Barbara)****[129]***Moche Chronology: An Evaluation of Radiocarbon Dates from North to South*

This paper presents a recent assessment of Moche chronology. Although radiocarbon dates are becoming more common, our understanding of the emergence, spread, and decline of the Moche material culture, is still mainly based on relative ceramic phases, rather than absolute dates. This study compiles a list of all known radiocarbon dates for different sites in the Moche sphere of influence and evaluates these dates based on the type of material sampled and its archaeological context. From there, we conduct a series of Bayesian analyses to elucidate how architecture, ceramics, and other material culture vary spatially and temporally. This analysis has implications for understanding how Moche visual culture was adopted, adapted, and modified for local consumption. Based on absolute dates, Moche civilization appears to have spanned between cal AD 200–900, with a significant and socially meaningful increase in stylistic homogeneity between cal AD 600–650. Overall, however, this study shows that Moche cannot be considered a monolithic culture and that time, regional, and valley-level histories and practices are critical to understanding sociopolitical dynamics

**Kornfeld, Marcel (PiRL, University of Wyoming) and Mary Lou Larson (PiRL, University of Wyoming)****[51]***Coping with Rocky Mountain High*

High altitude areas in North America are of limited extent, most being circumscribed high mountain peaks attesting to only seasonal, albeit sometimes low residentially mobile, prehistoric occupation. A handful of high-altitude locations, however, provide large contiguous areas conducive to permanent residency by multiple mobile prehistoric groups. Several Southern Rocky Mountain basins are in this category: San Luis Valley, South Park, Middle Park, North Park, and to some extent the Gunnison Basin. The responses to cold, high-altitude conditions on prehistoric populations of Middle Park have been noted previously in the form of intensifying resource extraction and domicile construction. In this presentation we revisit Middle Park data and expand our analysis of Paleoindian site distributions.

**Kosiba, Steve (University of Minnesota) and Carla Hernández Garavito (Wake Forest University)****[87]***The Transcendent Power of Rock: Landscape and Subjectivity in the Ancient Andes*

For centuries, researchers described Tiwanaku in terms borrowed from the Inka Empire and other expansionary states. Archaeologists of the twentieth century forwarded evolutionary arguments that positioned Tiwanaku as if it were the ancient Greece to the Inkas' imperial Rome—that is, the progenitor of a form of social organization guided by cosmological principles. Others saw Tiwanaku through the lenses of Western social theories that expect a city's power to grow due to elite control over production and ideology. John Wayne Janusek's scholarship broke new ground in Tiwanaku by turning from these evolutionary and political economic narratives to understand the city and its landscape on its own terms—as it was built, experienced, and even subverted from the ground up by its inhabitants. Focused on the intersection between landscape and subjectivity, Janusek's research moved beyond the central monuments of Tiwanaku to examine the far-flung natural places (e.g., quarries, peaks, and water holes) where diverse people would have gathered, engaged in political action, and attributed value to the city and its "sacred ecology." With this paper, we discuss the implications of these insights for our understandings of storied Inka environments at Cusco and Huarochiri, and for archaeological theories of landscape more generally.

Kosiba, Steve [224] see Chase, Zach

Koski-Karell, Daniel [19] see Perez, Elizabeth

Koski-Karell, Daniel [19] see Van Meter, Nicole

**Kostomitsopoulou Marketou, Ariadne (Independent Researcher) and Alexandra Rodler (Research Group Object Itineraries)****[155]***Traces of Color: Approaching the Evidence of Colorant Production in the Graeco-Roman World*

Over the last decades, archaeometric research has provided insight into the rich variety of materials that composed the ancient Mediterranean palette, including minerals, rocks, earths, metal oxides, lakes, and pyrotechnological products. Even though polychromy is today considered an important aspect of ancient Greek and Roman art, the organization of colorant production and trade remains rather unexplored. This is possibly due to the inherent complexity of pigments and dyes as archaeological materials, the relatively small quantities of finds, and the variability of possible sources. Recent methodological advances, including chemical micro-analysis and geochemical analysis, have demonstrated the potential to trace the provenance of raw materials and to identify colorant production loci. The archaeometric investigation of colorant provenance can therefore contribute to reconstructing economic networks that existed between Greek and Roman sites. This paper presents the archaeological, archaeometric, and literary evidence that indicate colorant manufacture on the Southeast Aegean islands of Rhodus (lead white) and Kos (Egyptian blue, earth pigments), aiming to situate the evidence of local colorant production within the contextual Mediterranean networks of economic and cultural exchange. Furthermore, the paper explores the relationship of colorant production with other industries, namely mining, metallurgy, and metalworking, through the lens of provenance studies.

**Kotegawa, Hirokazu (Universidad Nacional Autónoma de Honduras)****[179]***Desafío para obtener una identidad local a través del patrimonio arqueológico del sur de Veracruz*

El sitio arqueológico Estero Rabón se encuentra en una comunidad local pequeña llamada San Isidro, ubicada en el sur de Veracruz, México. En ésta comunidad desde 2012, además de las excavaciones arqueológicas, estamos realizando una investigación relacionada con la Arqueología Pública para buscar alguna manera de la convivencia entre la arqueología y la sociedad actual. En los últimos tres años, estamos enfocando a la identidad de ellos porque nos contaron la carencia de una identidad propia. La comunidad se encuentra actualmente como una sociedad mixta de varias familias inmigrantes de distintas regiones y pocas familias del grupo étnico originario. Ésta nueva comunidad no ha logrado obtener su propia identidad. Tampoco no podemos identificar como una comunidad del grupo étnico originario de la región porque es la minoría. Por ésta situación, decidimos utilizar el sitio arqueológico de Estero Rabón porque es un asentamiento prehispánico importante de la cultura olmeca muy conocida localmente y universalmente, además, ambas familias inmigrantes y originarias viven encima de este sitio arqueológico. Sólo mostraremos nuestras actividades realizadas por la meta mencionada, ya que la creación de una identidad se requiere un largo plazo para lograrlo.

**Kovac, Milan (Comenius University in Bratislava) and Dora Maritza García Patzán****[11]**

*Continuity and Discontinuity during the Transition Period (Terminal Preclassic–Early Classic) at Uaxactun, Petén, Guatemala*  
Uaxactun in the province of Petén, Guatemala is one of the most explored ancient Maya cities in general. Intensive research on our project over the past 12 years, focusing on the Preclassic period, has made it possible to complete the efforts of previous generations of researchers in many ways. We processed approximately 800,000 sherds and analyzed more than 40 radiocarbon samples, which at this important site had never been done before. We identified Group H North and its rulers as the last Preclassic center of power, and at the same time we found traces of its destruction and later attempts to restore the dynastic line at the same place. In Group E, we excavated a building completely built during the critical transition period. We found continuity, but also signs of significant cultural changes. Thanks to intensive excavations in the last decade, and the gradual completion of the puzzle from the end of one era and the beginning of another, Uaxactun can contribute to create a better picture of this complex period.

Kovac, Milan [62] see Safronov, Alexander

**Kozuch, Laura (University of Illinois)****[85]***Cahokian Shell Bead Crafting*

Shell beads were important to Mississippians and tens of thousands made from lightning whelk shells have been found mostly associated with human burials. I present data on shell bead crafting workshops and techniques from Greater Cahokia. Different bead types required different tools, due to the toughness of different shell parts. Columella versus disk bead workshops are thus differentiated, enabling more precise discussions of crafting. Perishable drill tips were probably used, and bead standardization is distinguished from craft specialization. Time spent on bead crafting indicates full-time crafting specialists. Long-distance expeditions to obtain lightning whelk shells from the eastern Gulf of Mexico were part of the operational chain. The resources spent traveling to get shells, large workshop areas, bead crafting time estimates, and the role shell beads had, and still have, in expediting souls in the afterlife underscore the importance of these shell artifacts.

**Kracht, Olivia (University of Florida), Steven Brandt (University of Florida), Elisabeth Hildebrand (Stony Brook University) and Courtney Sprain (University of Florida)****[90]***Geochemical Analysis of Volcanic Deposits in Mochena Borago Rockshelter, SW Ethiopia: Implications for Stratigraphic Correlation and <sup>40</sup>Ar/<sup>39</sup>Ar Geochronology*

Located on the western rim of the Southern Main Ethiopian Rift, Mochena Borago Rockshelter (MB) contains archaeological deposits from Late Pleistocene (>50–36 ka) and Holocene times. MB's complex depositional history and deposits >50 ka (beyond the range of <sup>14</sup>C dating) have hindered stratigraphic correlation between discontinuous excavation areas. Intermittent episodes of Quaternary volcanic events within the rift left definable pyroclastic layers interbedded between MB cultural deposits rich in lithics, ground stone, and ochre. Pyroclastic materials collected during the Southwest Ethiopian Archaeological Project's 2020 field season present an opportunity to temporally and spatially constrain MB occupation episodes. <sup>40</sup>Ar/<sup>39</sup>Ar geochronology and major and trace element analysis were performed on pyroclastic materials to (1) target dateable materials in MB and the surrounding area, and (2) identify potential correlations across past and current MB excavations. Initial results suggest that silicic tephra identified within the stratigraphic deposits provide a robust means of correlating major units within the rockshelter and will yield valuable age constraints for archaeological units at Mochena Borago. They also reveal multiple volcanic events, likely originating from diverse locations that would have impacted local landscapes and livelihoods in the southwest Ethiopian highlands, compounding climatic instabilities.

**Kradin, Nikolay (Russian Academy of Sciences)****[99]***Mongolian Polity Before and at the Beginning of Expansion: A View from Transbaikalia and the Russian Far East*

The Mongol Empire was the second large empire in world history. The deeds of the Mongols are well-known from written accounts, and there are numerous books and articles written on this subject. At the same time, the archaeological evidence dating to the earliest development of the Mongol Empire is much less known. This presentation summarizes the most recently available data on the main archaeological sites dated to the time before Genghis Khan and to the early history of his empire from Transbaikalia and the Russian Far East. It examines the features of the funerary rite practiced by the early Mongols and the changes in it during the empire and summarizes the most recent findings from the towns, palaces, and settlements.

**Krapf, Tobias (Universities of Basel / Paris I)****[147]***Connecting the Archaeological Records in the Lake Region between Albania, Greece, and North Macedonia: The Bronze to Early Iron Age Stratigraphy of Sovjan as a Reference for the Wider Area*

In the region of the lakes Ohrid, Prespa and Maliq, the last now dry, intensive prehistoric occupation developed, from the Early Neolithic onward. Today, this region, which is located half way between the Adriatic and the Aegean Sea, is divided between Albania, Greece, and North Macedonia. This affected significantly its archaeological exploration. The area around lake Maliq, the Korçë plain, became in the second half of the twentieth century the major center for prehistoric research in Albania, with several sites being intensively excavated. This effort continued after the opening of the Albanian borders and international collaborations were established, like the French-Albanian mission, which excavated for a period of 13 years the lakeside settlement of Sovjan. Its stratigraphic study is now completed and new dendrochronological dates have just become available. In this paper, the pottery sequence of the eight layers of the Middle Bronze to Early Iron Age will be presented and established as a reference for the contextualization of the other contemporary sites of the region. In fact, the sites of the lake region share many common traits of

material culture, several typical for this specific zone, underlining the importance to study the prehistoric period across the modern borders.

**Krasinski, Kathryn (Adelphi University), Fran Seager-Boss (Knik Tribe and Chickaloon Village Traditional Council) and Angela Wade (Chickaloon Village Traditional Council)**

[140]

*Community Archaeology in the Matanuska Watershed*

The alpine zone continues to be one of the least well-studied locations for archaeology in Alaska. However, the lack of information or dearth of archaeological sites reported in these zones does not mean a lack of use by Alaska Native people. Oral history and recent collaborative community archaeology projects in the Talkeetna Mountains and within the Matanuska Watershed have provided physical evidence demonstrating millennia of alpine use by Dene people. Community hikes and surveys serve to reconnect the Alaska Native descendants with their ancestors and help to demonstrate how nexus points within the Talkeetna Mountains facilitated subsistence activities as well as travel and social networks.

Krasinski, Kathryn [57] see Wygal, Brian

Krause, Samantha [153] see Harrison-Buck, Eleanor

**Kremer, Lisa (Vancouver Island University)**

[21]

*A Feast for the Senses: The Aqllakuna and Inka State-Sponsored Dining*

During the Inka expansion, state-sponsored feasting acted as a demonstration of authority, influence, wealth, and status in which women were central. Feasting, a familiar conduit for interacting with the ancestors and honoring important deities, presented a strategic sociopolitical tool for the state whereby power, ideologies, and identity were communicated. Chosen women, the Aqllakuna, embodied the values of the empire and were integral to both the feasting experience and for promoting integration and cohesion of subjugated communities. This poster examines multiple lines of evidence involving the Aqllakuna's domestic activities such as brewing, weaving, and crafting pottery for the state. Through the context of feasting, these elements positioned the Aqllakuna as benevolent emissaries of the empire.

**Kretzler, Ian (Cultural Resource Consultants) and Briece Edwards (Confederated Tribes of Grand Ronde)**

[223]

*Kanwai Ikta: Flipping the Script in Discussions of Indigenous Presence*

Standard temporal classifications in archaeology minimize Indigenous presence in settler colonial contexts. Archaeologists generally reserve "historic" or "postcontact" to describe sites composed of ostensibly non-Indigenous material assemblages. This approach reproduces a settler colonial conception of history as an evolution from Indigenous to settler, savage to civilized. It also places the onus on contemporary Indigenous communities to explain how Indigenous people are relevant to discussions of periods characterized by settler incursion. The principle of *kanwai ikta*, or "tell me what it is not," upends this dynamic. *Kanwai ikta* guides the work of the Confederated Tribes of Grand Ronde Historic Preservation Office. It frames Grand Ronde history as an expansive, ever-changing series of interactions and relationships that for millennia have linked peoples, practices, places, and nonhuman persons in western Oregon. In this presentation, we outline ways archaeologists, particularly those working in CRM contexts, may work from a place of assumed Indigenous presence. We argue that adopting *kanwai ikta* as a primary commitment stands to improve disciplinary practice by replacing temporal schema that tether Indigenous histories to settler colonialism with approaches that recognize the diverse routes Indigenous peoples have taken in protecting and celebrating places of historical significance.

Kretzler, Ian [141] see Leonard-Doll, Katy

Krigbaum, John [193] see Velasco, Matthew

Krigbaum, John [2] see Zavodny, Emily

Krossman, Courtney [131] see Tveskov, Mark

**Krug, Andrew (University of Oklahoma), John Carpenter (INAH-Sonora), Matthew Pailles (University of Oklahoma) and Guadalupe Sánchez (INAH-Sonora)**

[176]

*Marine Shell Conveyance and Brokerage Networks in the Río Sonora and Serrana Worlds*

Archaeologists in the Greater Northwest have developed several conveyance models to describe the circulation of rare goods. Yet many of these socioeconomic models do not articulate a role for the Río Sonora and Serrana peoples that occupied the river valleys of modern-day Sonora, Mexico, that likely served as critical corridors. The Proyecto Arqueológico de Sahuaripa y la Sierra Central, a joint project between INAH-Sonora and the University of Oklahoma, has to date unearthed 145 marine shell artifacts from pre- and proto-colonial contexts. To reconstruct shell networks, we shall perform one and two mode social network analysis (SNA) using genera and artifact type. These weighted networks will be assessed based on their centrality and betweenness measures to evaluate the conveyance and brokerage behaviors of a given node.

**Krupa, Krystiana (University of Illinois Urbana-Champaign)****[58]***Discussant***Krus, Anthony (University of South Dakota), Charles Cobb (Florida Museum of Natural History), Brad Lieb (Heritage Preservation Division), Edmond Boudreaux III (Mississippi State University) and Kandace Hollenbach (University of Tennessee, Knoxville)****[8]***A Mississippian Fin de Siècle Revisited: Updated Chronology for Mississippian Abandonment in the Middle Cumberland Region*

The Middle Cumberland Region (MCR) in Tennessee was host to centuries of Mississippian (AD 1000–1500) occupations, culminating with late Mississippian abandonments during the region's large-scale Vacant Quarter depopulation. A 2018 study we published in *American Antiquity* used Bayesian chronological modeling methods of the MCR's legacy radiocarbon dataset to estimate the tempo of the region's Mississippian abandonment and to present novel radiocarbon simulation experiments to estimate how future dating could be used to substantially improve these chronological understandings. In this follow-up study, we have used the results of this simulation experiment to guide the selection of a robust sample of new AMS radiocarbon dates from the villages dating to the final phase of Mississippian activity in the MCR. We have updated our chronological models with this new data and the results revisit ideas about the MCR's late Mississippian occupations, while providing further insight into the timing and tempo of the Vacant Quarter. By matching the radiocarbon sample numbers suggested by our initial simulation experiment, we also evaluate how the simulated results compare to the reality of this follow-up study and provide a larger commentary on the utility of such methods for guiding chronologically driven research designs in the American Southeast.

**Krus, Anthony (University of South Dakota)****[8]***Chair*

Krus, Anthony [31] see Jensen, Anne

Kuba, Cassandra [169] see Lee, Christine

**Kuhn, Steven (University of Arizona)****[16]***Discussant***Kuijt, Ian (University of Notre Dame)****[183]***Evolutionary G(r)ains? Neolithic Food Insecurity, Storage, and Social Inequality*

The development of plant storage represents one of, if not the, single most important evolutionary moment in human prehistory. The ability of people to manipulate food in the Near East, both wild and domestic, and to regularly overcome seasonal availability through good years and bad, reflects a technological and economic tipping point. The gradual development of plant storage technology in the late Pleistocene and early Holocene, however, did not produce an immediate food surplus. Rather, in combination with enhanced food production, increased plant storage led to reduced risk and food insecurity and served as a buffering mechanism. Drawing on archaeological research and ethnographic datasets, this presentation looks at storage planning, spoilage rates, and the interconnectivity between stored foods and population. Archaeological data from Neolithic southwest Asia highlights that while food storage preceded plant domestication it did not lead to well-entrenched status differences within Neolithic communities. This requires us to rethink causal models arguing that food storage led to social inequality in early villages.

**Kuijt, Ian (University of Notre Dame)****[183]***Chair*

Kuijt, Ian [179] see Donaruma, William

Kulhavy, Kathryn [71] see Zejdlik, Katie

**Kullen, Douglas (Burns & McDonnell)****[60]***Big Shoulders: An Anecdotal and Biographical History of Notable Chicago Archaeologists*

Poet Carl Sandburg described Chicago as stormy, husky, brawling—alive and strong and cunning—a tall, bold slugger: the City of the Big Shoulders. Chicago's archaeologists have carried on in that tradition. This paper reviews the lives and accomplishments of Chicago's "Big Shoulders" archaeologists, whose bold and pioneering works range from the beginnings of Egyptology and the early days of Midwest archaeology to monumental contributions to North American and Middle Eastern archaeology, archaeological methodology and theory, environmental archaeology, and skeletal and lithic analyses.

**Kullen, Douglas (Burns & McDonnell)****[60]***Chair***Kulstad-González, Pauline (Independent Scholar)****[44]***Assessing the Usefulness of Caribbean Legacy Collections: The Case of Parque Histórico y Arqueológico de la Vega Vieja [La Vega Vieja Historical and Archaeological Park], Dominican Republic*

The Parque Histórico y Arqueológico de la Vega Vieja contains parts of one of the two oldest European cities in the Americas—Concepción de la Vega. It offers the opportunity to assess some of the earliest Spanish, Amerindian, and African entanglements. Additionally, the archaeological site represents a tightly dated context (1495–1564) with no large, subsequent, occupation until the twentieth century. This is unlike Santo Domingo, the other oldest city, which has been continuously occupied since 1498. In 1996, a moratorium was placed on archaeological excavations at the park due, in large part, to a lack of storage. From 1976 to 1995, the Dominican Parks Service, under the guidance of various Dominican and international archaeologists and preservation architects, had excavated large portions of the site, but had not curated the assemblage (approximately 278,000 items). As most of these items were not complete enough for exhibition, a question arose as to whether these items needed to be kept in the repository. This paper will not only document two attempts at proving these items worthy for storage, but will also identify curation and excavation practices still in use which continue to hinder the dissemination of Dominican historical archaeology.

Kuman, Kathleen [186] see Horn, Maryke

**Kumbani, Joshua (University of Witwatersrand)****[211]***Discussant*

Kunikita, Dai [120] see Izuho, Masami

**Kupprat, Felix, Verónica Vázquez López (Tulane University), Debra Walker (Florida Museum of Natural History), Armando Anaya Hernández (Universidad Autónoma de Campeche) and Nicholas Dunning (University of Cincinnati)****[11]***The Transition from the Preclassic to the Classic Period in Yaxnohcah, Campeche*

Yaxnohcah is a large archaeological site in southern Campeche, Mexico. Its urban landscape is dominated by large civic-ceremonial complexes, mostly built during the Late Preclassic period (400 BCE–200 CE), and a dense web of residential compounds, a majority of which seem to date to the Late Classic (550–1000 CE). Yaxnohcah's Early Classic (200–550 CE) occupation is less evident from survey data, but excavations throughout the site have revealed that the site was inhabited during this period. In this paper we explore settlement development during the Preclassic–Classic transition, focusing on continuities and disruptions in both public ritual groups and residential areas. Thickening evidence from domestic contexts, including a central palace group, suggests occupational continuity and some construction activity throughout the Terminal Preclassic and the Early Classic. However, Early Classic activity in the more public ceremonial spaces is restricted to a few contexts. We discuss these findings as indicators of social and ideological shifts that marked the transitional period.

**Kupprat, Felix****[11]***Chair*

Kupprat, Felix [48] see Reese-Taylor, Kathryn

**Kurnick, Sarah (University of Colorado Boulder) and David Rogoff (University of Pennsylvania)****[104]***Community Archaeology Meets Settlement Pattern Studies: Reassessing the Relationship between Punta Laguna and Cobá*

Today, Cobá—an ancient Maya metropolis and contemporary village in Mexico's Yucatán Peninsula—is a substantial tourist attraction, drawing approximately 700,000 visitors per year. Twenty km to the northeast, Punta Laguna—a much smaller ancient Maya community, a smaller contemporary village, and a spider monkey reserve—also draws significant numbers of tourists wanting to see wild spider monkeys, canoe across the lagoon, and repel into the cenote. Punta Laguna residents, who collaboratively manage and collectively profit from the reserve, understand that their success derives, in part, from their physical proximity to Cobá. Perhaps not surprisingly, residents asked the Punta Laguna Archaeology Project (PLAP) to learn more about the relationship between Punta Laguna and Cobá in the past. Did the past inhabitants of Punta Laguna also benefit economically or otherwise from their close physical proximity to Cobá? And if so, did all past inhabitants of Punta Laguna benefit equally, or did some benefit more than others? This presentation uses data from PLAP excavations of households and public buildings to answer community members' questions. In doing so, it also affirms the benefits of adopting a community archaeology approach and specifically of local peoples developing project research questions.

Kurnick, Sarah [96] see Puente, Nicholas

**Kvamme, Kenneth (University of Arkansas)****[52]***Magnetic Gradiometry at the Joy Creek Major Site (13PM7), Iowa*

A magnetic gradiometry survey was undertaken at the Joy Creek Major site (13PM7), a settlement of the Mill Creek culture of the Initial Middle Missouri variant located on the south bank of the Big Sioux River in northwestern Iowa. Within the 80 × 100 m survey area, Zone 1 contains numerous anomalies related to the settlement, representing such archaeological features as houses, fortification ditches, bastions, hearths, pits, middens, burned posts, and fire-cracked rock. Two fortification ditches are present, one interior to the other, and as many as 17 rectangular shaped Mill Creek houses are suggested in three rows with long axes uniformly pointing southwest. Most are associated with robust anomalies that likely represent centrally placed hearths with others denoting auxiliary hearths or storage pits. The region of Zone 2 contains a host of negative, contiguous, polygonal anomalies 2–7 m in diameter that appear similar to periglacial features, but which likely arise from wet and dry cycling of the underlying Holocene sediments. Zone 3 defines a portion of the survey area truncated by a paleochannel that has obliterated nearly all archaeological remains. A comparison of 13PM7 with geophysical and other results from nearby settlements shows remarkably similar village characteristics.

Kyaw, Pyiet Phyo [181] see Macrae, Scott

**Kyle-Robinson, Lachlan and Geoffrey McCafferty (University of Calgary)****[187]***A Comparative Analysis of Nicaraguan Lithic Assemblages Found at the Sapoa Period Sites of Tepetate and El Rayo*

This paper analyzes and compares lithic assemblages found between two separate but geographically similar Sapoa period (800–1300 CE) sites found on the shores of Lake Nicaragua. This research will employ the use of quantified data coupled with an analysis of the techniques used to manufacture lithic tools and the ensuing use wear patterns. A comparison of lithic assemblages associated with the Bagaces period (300–800 CE) present at El Rayo provides the context with which the transition of lithic technologies characteristic of the Sapoa period can be compared and evaluated. The aim of this research is to analyze commonalities present in the lithic assemblages of these different archaeological contexts in an effort to ascertain similarities or differences present in the implementation of Nicaraguan lithic technologies associated with lacustrine environments during the Sapoa period.

**LaBelle, Jason (Colorado State University) and Kelton Meyer (Colorado State University)****[51]***The Emergence of Leadership in the Alpine Country: Hunting Blinds and Game Drives of the Colorado Front Range, USA*

Communal hunting is a global phenomenon, though the emergence and necessity for leadership in such contexts is poorly understood. Such events demanded experienced leaders to increase the chance for success and lower risk in potentially challenging environments. The state of Colorado contains the highest density of alpine hunting traps in North America, with more than 70 documented among the various mountains but primarily along the crest of the Front Range. Rollins Pass, a low crossing within this range, contains 12 game drives forming a cultural landscape comprised of at least 187 hunting blinds, 8 km of rock walls, and cairns. The shape and size of the blinds, coupled with their spatial position within the drive systems, provides an opportunity to study the staging of individuals for hunting events. Most blinds are small, likely accommodating a single individual. Larger blinds found at the apex of U- and V-shaped funnel lines, suggest a different function. We argue that experienced leaders utilized these specific blinds, coordinating others from their strategic viewpoint, though we also consider alternative interpretations related to pre- or post-hunt activities associated with the drive.

**LaBelle, Jason (Colorado State University)****[97]***Discussant***Labrador, Angela (Vermont Archaeological Society)****[190]***Revolutionary Past Meets Digital Future: Going Virtual with Place-based Teacher Training*

When the Vermont Archaeological Society was awarded a National Endowment for the Humanities Landmarks of American History and Culture grant for the summer of 2020, we were prepared to host 72 K–12 teachers on the shores of Lake Champlain where they would learn firsthand the magic of using archaeology to deliver place-based education to their students. Entitled “Freedom and Unity: The Struggle for Independence on the Vermont Frontier,” the weeklong workshops featured an immersive program of participatory learning activities related to the American Revolution at partnering historic sites in Vermont’s Champlain Valley. Enter COVID. After postponing the 2020 program, we made the difficult decision to transition to a virtual context for 2021. Then came the real challenge: how to teach place-based education using terrestrial and underwater archaeological sites fully online—and without a physical place. It was a tall order, but our strategic and innovative use of technology helped us deliver a successful and highly reviewed workshop that was in many ways more usable for teachers than what we would have done in person. This paper will highlight the digital experiences we developed and offer inspiration—and tips—for those looking to embrace place-based, virtual education.

**Laffoon, Jason (Leiden University)****[19]***Isobiographies of Indigenous Lifeways: A Review of Dental Multi-isotope Data from the Caribbean*

Traditional approaches to the study of paleodiet in Caribbean archaeological research have often focused on the analyses of food refuse (archaeobotany and archaeozoology), while traditional approaches to the study of paleomobility have generally focused on large-scale changes in material cultural distributions. Roughly coinciding with the founding of bioarchaeology, isotope analyses of human skeletal remains have been increasingly applied to paleodietary, and, subsequently, paleomobility reconstructions. Stable isotope approaches to the study of human paleodiet (carbon and nitrogen isotopes) and human paleomobility (strontium and oxygen) have too often been dealt with separately in archaeology but in more recent years there is a clear trend toward the explicit combination of these methods in the Caribbean and beyond. Previous research utilizing stable isotopes to reconstruct ancient foodways have generally focused on data obtained from bones (collagen and apatite) rather than teeth (enamel and dentine). This paper presents an overview of isotope approaches to the study of Caribbean Indigenous lifeways, diet, and mobility patterns with a special emphasis on isotope data derived from dental remains. It will also critically reflect on the limitations and potentials of these approaches for this specific region as well as potentially fruitful directions for future research.

**Laffoon, Jason (Leiden University)****[19]***Chair*

Laffoon, Jason [19] see Chinique de Armas, Yadira

Laffoon, Jason [125] see Reyes, Idali

Laffoon, Jason [166] see Shev, Gene

Laló Jacinto, Gabriel [199] see Paris, Elizabeth

**Lambert, John (Illinois State Archaeological Survey) and Thomas Loebel (Illinois State Archaeological Survey)****[97]***Cody Complex Foragers on the Eastern Fringe: Scottsbluff and Hardin in the Western Great Lakes*

Rapid environmental change in the western Great Lakes during the Late Pleistocene/Early Holocene led to the development of multiple productive ecosystems which would have been a major draw for hunter-gatherers. The proliferation of Cody complex (primarily Scottsbluff and Hardin) sites in the region may signal an influx of populations from the Great Plains. Lithic data indicate that while Cody complex groups were highly mobile, the direction, scale, and frequency of residential moves varied in important ways from north to south. This can likely be attributed to the time-transgressive nature of north to south environmental reorganization during the Pleistocene/Holocene transition and the exploitation of different resource patches by Scottsbluff and Hardin groups. Differing spatial distributions of Scottsbluff and Hardin point styles also suggest the development of two adjacent social systems with a small degree of overlap and at least some degree of interaction. The fluid social boundary between Scottsbluff and Hardin groups suggests the development of an increasingly dynamic but relatively open social landscape in the Early Holocene Great Lakes that predates the onset of demographic packing, more fixed territories, and lower levels of residential mobility.

**Lambert, John (Illinois State Archaeological Survey)****[97]***Chair*

Lambert, John [97] see Loebel, Thomas

Lambert, John [164] see Tolmie, Clare

**Lambert, Shawn (Mississippi State University) and Paige Ford (Arkansas Archeological Survey)****[15]***Thinking Beyond Imitation: Ceramic Evidence of Early Caddo Residential Craft Specialists at Cahokia*

This paper explores the stylistic grammar of Early Caddo (AD 900–1150) ceramic fine ware vessels recovered from the East St. Louis Precinct excavations at Cahokia. Previous compositional studies have shown they were not manufactured in the Caddo area but locally made at Cahokia. Potters often tempered the vessels with shell and made Caddo and Cahokia-like vessel forms on which to place Early Caddo imagery. However, the question remains whether the vessels were made locally by Cahokia potters or by foreign Caddo craft specialists living at Cahokia. Here, a stylistic grammar analysis is employed comparing the grammar of over 300 Early Caddo whole vessels from the Caddo area with 36 Early Caddo vessels from Cahokia to determine whether residential Caddo craft specialists manufactured them. Preliminary results show a significant amount of stylistic grammar cohesion between the Caddo and Cahokia vessels, suggesting they were manufactured by residential Caddo craft specialists at Cahokia. Lastly, potters use of mixed-style vessels is hypothesized to be a product of nonlocal Caddo potters who, operating within a communities of practice, incorporated elements of Cahokia style alongside indigenous ones, producing a material expression of the social middle ground.

Lambert, Shawn [136] see Colaninno, Carol

Lambert, Shawn [159] see Rayburn, Kathryn

**Lamoureux-St-Hilaire, Maxime (Davidson College) and C. Matthew Saunders (American Foreign Academic Research)**  
[159]

*The Mayanist: Open-Access, Peer-Review, Sweet Art, and Free Bilingual Publishing*

We launched our biannual journal *The Mayanist* to fill-in a vacuum in the world of academic publishing. The journal is tailored for public science and its open-access format is unique. We charge nothing to authors, for whom we arrange collaborations with artists to create sweet, original art that makes our articles uniquely appealing. Our review process is streamlined, pain-free, and quick. Our articles are offered in English, Spanish, or both, in an effort to increase the accessibility of peer-reviewed literature in Latin America. *The Mayanist* emerged from the nonprofit American Foreign Academic Research's (AFAR) biannual conferences, Maya at the Playa and Maya at the Lago, and following serious interest from our attendants (many of whom are nonacademics) to learn more from our presenters. Thus, publication in *The Mayanist* currently stems from participation in our conferences. Yet, our five first issues feature multiple anthropological fields and many authors of all backgrounds. Come by our poster, meet us, look at some *The Mayanist* art, and help us steer this publication project toward a future where Mayanists take their scientific dissemination role seriously.

Lamoureux-St-Hilaire, Maxime [161] see Nowak, Isabel

**Landau, Kristin (Loyola University Chicago)**

[204]

*Documenting Los Sapos: Traditional, Digital, and Collaborative Methods toward Conservation*

Los Sapos is a carved bedrock outcrop located within the San Lucas neighborhood of the ancient city of Copán in western Honduras. Most likely a religious shrine relating to fertility, the carvings include a toad ("sapo"), crocodile, male performing autosacrifice, altars, steps, and now-illegible markings. The site is key for understanding how religious practices changed in Copán during the establishment and collapse of Maya rulership within this multiethnic region. Despite its uniqueness and rapid deterioration, Los Sapos has been little studied. Therefore, I review our recent traditional (pencil and paper) and 3D digital (photogrammetry, laser scanning) efforts to document the carvings, for both continued scientific study and the creation of immersive websites for the public. I also discuss how long-term conservation of the site is only possible through collaboration with locals, land owners, and Indigenous peoples.

**Landazuri, Heather (University of Maine, Orono) and Daniel Sandweiss (University of Maine)**

[88]

*Avenidas de Agua: Indigenous Resilience during the 1578 El Niño*

Following the devastating 1578 El Niño event that ravaged recently centralized Native communities on the coast of Peru, royal authorities in Lima dispatched scribe Francisco de Alcocer to investigate the catalyzing events that led to a series of petitions by Native leaders for temporary tribute relief. The resulting transcripts, amounting to about half of the original document, were recovered and published by Peruvian ethnohistorian Lorenzo Huertas in 1987 and again in 2001. Building on the collaborative research efforts of Copson and Sandweiss in the late 1990s, Heather A. Landazuri (with the assistance of Dan Sandweiss) further translated, categorized, and analyzed the remaining eyewitness accounts for insight into indigenous coping strategies in response to El Niño, lessons for the future from millennial traditional ecological knowledge (TEK) and increased understanding of past El Niño events.

Landazuri, Heather [88] see St. Amand, Frankie

Lander, Brian [185] see Brunson, Katherine

**Lange, Ryan (University of Iowa Office of the State Archaeologist) and Bryan Kendall (University of Iowa Office of the State Archaeologist)**

[113]

*Using 3D Point Data to Define Activity Areas at the Dixon Site (13WD8), Woodbury County, Iowa*

3D point data was collected for artifacts recovered during the 2016–2017 excavation of the Dixon Site (13WD8), an Oneota (AD 1300–1400) village in western Iowa. Analyses of these data are used to define activity areas and site organization in relation to habitation structures and the surrounding landscape.

**Langlie, BrieAnna (Binghamton University), John Wilson (University of Arkansas), Carlos Osoro Mendives (Pontificia Universidad Católica del Perú) and Jacob Frank (Binghamton University)**

[126]

*Locating Agricultural Terraces in the Southern Peruvian Andes*

Driving through the Lake Titicaca basin in southern Peru travelers are often struck by terrace covered mountains rising from the flat plain. Nearly every hillside encountered has been transformed from steep faced rocky slope into arable land. These ancient fields were constructed and cultivated millennia ago to help farmers adapt to the high-altitude, arid ecosystem, an ever-oscillating climate, and dynamic cultural regimes. Farmers still primarily cultivate these ancient fields to fill their granaries and dinner plates. However, very little is known about the extent of these terraces, when they were built, or who built them. In this paper, we discuss previous research on terraces and other field systems in the region, archaeological survey targeting terraces, and the production of an integrative GIS database. In sum, this multi-methodological approach locates the extent of agricultural terrace complexes, associates them with known archaeological sites, and characterizes them based on visible features. This approach allows us to quantify and characterize terraces in a way that is not possible from terrestrial survey methods alone.

**Langlie, BrieAnna (Binghamton University)****[43]***Discussant*

Langlie, BrieAnna [38] see Chen, Jennifer

Langlie, BrieAnna [22] see Maybee, Brooke

Langlie, BrieAnna [82] see Whittemore, Anna

**Langlitz, Meredith (Archaeological Institute of America) and Ben Thomas (Archaeological Institute of America)****[190]***Online Activities and Content, Networking, and the Importance of Community: Lessons from Presenting Public Programs in a Pandemic*

As a cultural institution without a physical presence that is open to the public, the Archaeological Institute of America is familiar with providing people with online or virtual opportunities to engage with archaeology. The onset of the pandemic saw us relying heavily on past experiences while scrambling to adapt and scale up. Over the course of the pandemic, we found that by being flexible and creative, and by providing forums for our colleagues to brainstorm and share ideas, we were able to continue interacting with the public in meaningful ways; increase accessibility; and work with our network of International Archaeology Day (IAD) collaborating organizations to help others do the same. In this paper we discuss the professional community that came together through our Listening Sessions during the pandemic and reflect on a series of online initiatives that we were able to launch or redesign during the pandemic: including IAD programs such as Build Your Own Monument, Tweetathons, and ArchaeoDoodles; our first online ArchaeoCon; the transformation of the 124-year-old national lecture program into a series of over 200 online webinars, and more.

Lanoë, François [216] see Zedeño, María Nieves

Lansdell, Michael Brent [119] see Rankin, Caitlin

Lanzarone, Peter [90] see Wilson, Evan

**Lapp, Jennifer****[7]***Moderator***Lara, Catherine (Instituto Francés de Estudios Andinos)****[124]***Technological Boundaries as Evidence of Close Interactions? The Case of the Cuyes River Valley (Southeastern Ecuadorian Highlands)*

Located in the southeastern corner of Ecuador, the Cuyes River valley is a conduit between the Andes and the Amazon. In the late 1970s, monumental structures (presumably precolumbian) discovered in this area raised the question of who the prehispanic inhabitants of this valley were: Andean or Amazonian peoples? The research summarized here describes how this question was approached through a technological analysis (*chaînes opératoires*) of the ceramics excavated in the Cuyes valley. Results point to the presence both of a Cañari (Andean) and an Aénts Chicham (Amazonian) tradition. Along with archaeological and ethnohistoric data the geographic distribution of these traditions supports the hypothesis of a strong interaction between the precolumbian inhabitants of the Cuyes River valley.

**Larkin, Karin (University of Colorado at Colorado Springs)****[7]***Discussant***Larrick, Dakota (University of Oklahoma), John Carpenter (INAH), Guadalupe Sánchez (INAH) and Matthew Pailes (University of Oklahoma)****[176]***Demographic Persistence and Culture Diversity in the Fronteras Valley, Sonora, Mexico*

This poster presents data from two seasons of excavation and survey in the Fronteras Valley, Sonora, Mexico. The region presents evidence for substantial culture diversity. Sites within a small geographic area appear associated with the differing traditions of Casas Grandes and Rio Sonora. Chronologically later protohistoric sites defy classification in existing culture area taxonomies. Ceramic and obsidian data also suggest diverse connections to surrounding regions. This high level of culture diversity is exceptional in a regional context. Additionally, there are no signs of major demographic upheaval in the Fronteras Valley, unlike surrounding Mogollon, Hohokam, and Casas Grandes regions. Though environmental factors likely contribute to this unique persistence, we argue the high degree of local culture diversity is a plausible positive contributor to the valley's long-term record of demographic continuity.

**Larson, Kara (University of Michigan) and Geoffrey Ludvik (University of Wisconsin, Madison)****[23]**

*Identifying a Bone Tube Workshop: A Multi-method Zooarchaeological Approach at an Early Urban Center from Tell el-Hesi, Israel*  
The Joint Archaeological Expedition to Tell el-Hesi (1970–1983) in Southern Israel identified an unusually large number of incised bone tubes ( $n = 15$ ) from the only excavated Early Bronze Age IIIA contexts at the potentially early urban site. At the time, ignoring the quantity of these distinctive artifacts, the encountered occupation was labeled as a domestic area. This research argues against the original notion of the excavated occupation as a domestic area and provides zooarchaeological evidence for the existence of a bone tube workshop that was operational during the Early Bronze Age IIIA. We identify the workshop's presence using a suite of archaeological correlates: (1) the physical concentration of animal remains, partially finished bone tubes, and copper tools; (2) reconstruction of the *chaîne opératoire* using SEM and Dinolite analyses to uncover a distinctive production sequence from the bone tubes and debris from this sector; and (3) closely shared stylistic and morphometric attributes among both finished and partially finished bone tube fragments. This study demonstrates the importance of multiple zooarchaeological analyses to distinguish and understand the first identified Early Bronze Age bone tube workshop in the Southern Levant and its interrelation with an early urban center.

**Larson, Kara (University of Michigan)****[23]**

Chair

Larson, Kara [23] see Tomazic, Iride

Larson, Mary Lou [51] see Kornfeld, Marcel

**Lau, George (Sainsbury Research Unit, University of East Anglia), Ivan Ghezzi (Programa Chankillo), Sabine Hyland (University of St Andrews) and Gabriel Prieto (University of Florida, Gainesville)****[192]***Toward a More Perfect Horizon: Introductory Words and Perspectives on the Ancient Andes*

This presentation serves to introduce the session, its contexts and contributors, and surveys briefly our memorable collective experiences with the work and influence of Dr. Richard L. Burger. The contributions of this session draw from a wide range of disciplines and approaches (e.g., field archaeology, archaeometry, museum studies, cultural heritage) and demonstrates both the breadth of his scholarship and the impacts of his intellectual work, collaborations and mentorship. "Horizon" refers to the enduring organizing notion that frames the Andean past; it also signals the depth of contribution and vision afforded by the scholar's work.

**Lau, George (Sainsbury Research Unit, University of East Anglia)****[192]**

Chair

Lau, George [84] see Munro, Kimberly

**Lau, Hannah (Hamilton College), Sarah Kansa (Alexandria Archive Institute) and Rana Özbal (Koç University)****[122]***Tracing Collective Action through Pastoral Resources: Evidence from Tell Kurdu and Domuztepe, Sixth Millennium Southern Anatolia*

This paper compares zooarchaeological evidence for the consumption of pastoral resources and the prevalence of collective action events at the sixth millennium BCE sites of Tell Kurdu and Domuztepe. During this period, southern Anatolia was a dynamic social landscape, with communities in the region experimenting with different forms of organization and engaging at different degrees with the Halaf cultural sphere and other contemporary local traditions. This research draws on many years of analysis of faunal remains totaling over 20,000 specimens across the two sites. Through a consideration of the different ways particular pastoral resources were used within the communities for daily meals and communal feasts, we examine social, political, and economic processes within communities and demonstrate the great variability in subsistence and commensal practices during a period often characterized by homogeneity across a wide swath of prehistoric Southwest Asia.

Lau, Hannah [38] see Roselli, Isabella

Lau, Hannah [71] see Subramaniam, Nandini

**Laugier, Elise Jakoby (Rutgers University)****[126]***Agricultural Landscapes of the Mesopotamian-Zagros Foothills*

Situated at the interface of the Mesopotamian lowlands and the Zagros Mountain highlands, the Zagros foothills of ancient Iraq encompass a steep environmental gradient used for millennia for a range of agro-pastoral practices. While conventional satellite remote sensing and field survey reveal a landscape inscribed with field systems, water management features, and pastoral trackways, land use features dating to the Bronze Age (late fourth–second millennium BCE) remain elusive, masking the conditions in which early states and empires emerged and operated. Coupled with regionally poor macrobotanical preservation, we are challenged by limited empirical data for understanding agricultural land use in these earlier periods. Phytoliths offer a robust dataset for assessing past agro-pastoral practices and may be critical for reconstructing agricultural landscapes in ancient Iraq. Drawing on a suite of microremain and geochemical data from regional excavations, this study highlights the potential of phytoliths to

supplement investigations of this diverse and challenging agricultural landscape. Results demonstrate the necessity of integrating multi-scale approaches to assess Bronze Age agricultural landscapes in ancient Iraq. Additionally, the paper discusses the importance of considering the impact of modern land use and the ongoing challenges of reconstructing ancient landscapes in rapidly developing, active agricultural zones.

**Laumbach, Karl (Human Systems Research Inc.) and Toni Laumbach (Human Systems Research Inc.)**

[86]

*Interaction on the Northern Mogollon Frontier: Perspectives from the Cañada Alamosa*

The Cañada Alamosa is a spring-fed canyon located on the northeastern edge of the Mimbres Mogollon world. The Ojo Caliente or Warm Spring supplies 2,000 gallons per minute, ensuring a perennial flow. Separated by 50 miles and the imposing Black Range from the Mimbres cultural center, the canyon's well-watered position on a "zone of interaction" between the Mogollon and Ancestral Puebloans resulted in a unique cultural sequence that reflects a variety of local interactions as well as changes in their respective centers. Clear evidence for such interactions begins in the pit house period and continues in various forms until the abandonment of the canyon in the fourteenth century. Varying by temporal period, cross-cultural interactions include exchange, short distance population movements, creolization, aggregation, migration, contemporary occupation by two cultural groups, and multiple abandonments.

Laumbach, Toni [86] see Laumbach, Karl

**Lazagabaster, Ignacio (Museum für Naturkunde), Micka Ullman (Hebrew University, Jerusalem, Israel), Roi Porat (Hebrew University, Jerusalem, Israel), Uri Davidovich (Hebrew University, Jerusalem, Israel) and Nimrod Marom (University of Haifa, Haifa, Israel)**

[85]

*Evidence of Ecosystem Changes through the Study of Late Pleistocene-Holocene Mammal Assemblages and Cave Exploration in the Judean Desert*

Long temporal records of wild mammal communities are essential to determine the role of human impact and climatic fluctuations in the modern configuration of ecosystems. Here, we report the results of extensive surveys in the Judean Desert as part of the DEADSEA\_ECO project, which include over 140 dated mammalian remains from 19 different cave sites. The presence of a subspecies of an Afro-tropical rodent, the crested rat *Lophiomys imhausi maremortum*, until at least 42 ka, and the recovery of mammals that are now extinct in the region, including arboreal squirrels, bears, spotted hyenas, cave leopards, and cervids, point toward more humid and productive habitats during the Late Pleistocene. The southern expansion of glaciers during the Last Glacial Maximum brought vegetation and fauna typical of more septentrional and colder regions. The Holocene aridification trend culminates in the Late Holocene with fewer observations of Arabian leopards and gazelles, and an increase of Syrian striped hyenas, foxes, ibex, and hyrax. While the Late Pleistocene was clearly marked by glacial-interglacial phases, the weight of evidence ultimately favors an explanation of the observed patterns during the Holocene as the consequence of a combined anthropogenic and climatic impact on local food webs.

Le Maillot, Christophe [221] see Meacham, Samuel

**Le Moine, Jean-Baptiste (Université de Montréal), Carolyn Freiwald (University of Mississippi) and Christina Halperin (Université de Montréal)**

[130]

*The Dynamics of Uneven Inequalities: Classic to Postclassic Transitions at the Site of Ucanal, Petén, Guatemala*

Over the course of history, the process of social leveling emerged during particular moments and in particular places, and such processes are just as critical to examine as the embodiment and institutionalization of inequalities. The Classic to Postclassic transition in the Southern Maya Lowlands is purported to be a time in which some inequalities were reworked, negotiated, or rendered obsolete as part of a changing political system. By combining the malacological, obsidian, and ceramics data excavated from the archaeological site of Ucanal, this paper explores if ancient inhabitants of the city of Ucanal participated in a changing social system of more equitable access to goods and an increasing disregard for status display. Over the course of the Classic to Postclassic periods, we find that some practices of emphasizing difference were minimized while others were accentuated. Some networks of control were tightened while others were loosened in an ongoing dynamic of uneven inequalities.

Le Roux, Petrus [200] see Uribe, Mauricio

Lea, Trevor [24] see Wurtz Penton, Michelle

**Leader, George (College of New Jersey), Theodore Marks (New Orleans Center for Creative Arts), Rachel Bynoe (University of Southampton), Kaarina Efraim (National Museum of Namibia) and Dominic Stratford (University of the Witwatersrand)**

[90]

*Technological Adaptations in the Namib Desert: A New Look at Earlier and Middle Stone Age Sites*

At 55 Ma the Namib Desert's Sand Sea in Namibia is one of the oldest and most arid deserts on earth. However, ESA and MSA artifacts are scattered throughout this landscape. This new project has reinvestigated known sites, as well as discovered new sites,

which provide a better understanding of how human ancestors were moving within this hyper-arid environment. In particular, we present new discussion of the ESA bifaces at the site of Namib IV, and present a newly dated Middle Stone Age site, Narabeb. Paired with OSL dates of the associated alluvial deposits, we examine whether or not hominins were exploiting this environment only during periods increased water availability, or during arid periods as well.

**Leahey, Aidan (Hamilton College), Colin Quinn (Hamilton College), Horia Ciugudean (Muzeul Național al Unirii Alba Iulia), Jess Beck (Harvard University) and Lacey Carpenter (Hamilton College)**

[71]

*Geoarchaeological Analysis of Cemetery Construction in Early Bronze Age Transylvania*

The site of Ramet, in the Apuseni Mountains of southwest Transylvania, is an important location to study how Early Bronze Age communities reused space and transformed their cultural landscape. Ramet was originally a Copper Age fortified homestead on a small hill built by a Cotefeni Culture community. It was then deconstructed and repurposed as a cemetery in the Early Bronze Age. During the deconstruction event, people scoured the top of the hill and filled in the fortification ditches. By deconstructing the previous settlement and making it something completely different, Early Bronze Age communities engaged in the social process of placemaking. Little is known, however, about the site formation processes that occurred during the transformation from settlement to cemetery. In this poster, we present the results of a suite of geoarchaeological analyses conducted at Ramet. The results from these analyses help us to better understand the deconstruction of a Copper Age settlement and the construction of Early Bronze Age mounded tombs; a phenomenon that occurred at many sites in Transylvania. These results provide a more complete picture of the practice of transforming settlements into cemeteries in Bronze Age Transylvania.

**LeBlanc, Megan, Susan deFrance (University of Florida) and Ana Londoño (Lindenwood University)**

[67]

*Coastal Paleolandscapes of Far Southern Peru: Implications for Late Pleistocene Human Settlement*

This poster uses bathymetric data and reconstructed global mean sea level curves from the Last Glacial Maximum to the Holocene to study paleolandscapes found during the Late Pleistocene and Early Holocene in far southern Peru. During the Last Glacial Maximum (LGM), sea level was 40–100 m lower than today. This coincides with the archaeological evidence of the initial coastal settlement of western South America. Beginning around 15,000 years BP and continuing for the next 8,000 years, sea levels rose and covered many coastal sites. On the south coast of Peru, tectonic uplift has kept sites such as Quebrada de los Burros, Quebrada Tacahuay, the Ring Site, Kilometer 4 (K4), and Quebrada Miraflores from becoming inundated. These sites are the focus of this study. At each of these sites, we analyze cross-sections drawn perpendicular to the modern shoreline and measured both the extent of the exposed land surface and proximity from the sea level curves to each of the five sites. Our analysis identifies previously undocumented littoral habitats consisting of large, shallow water bays, significant rocky headlands, and beach habitats. This project readdresses coastal migration and settlement models within the context of our reconstructed paleolandscapes.

**Leboeuf, Gail**

[1]

*Discussant*

Lebow, Clayton [24] see Nocerino, Eric

Lebow, Clayton [24] see Wienhold, Michelle

**Leclerc, Elizabeth (University of Maine)**

[88]

*A River Runs through It: Basin-wide Perspectives on ENSO's Hydrological Risks and Opportunities*

Regarding the terrestrial environment, the risks and opportunities the El Niño-Southern Oscillation system (ENSO) poses for human societies are in large part tied to water flows and availability. For Peru's coast, these are especially visible during canonical Eastern Pacific (EP) El Niño events, which bring intense rainfall to this otherwise xeric region, sometimes with disastrous effects. Indeed, archaeologists working in this region have focused primarily on cultural responses to the immediate, local impacts of EP events. However, EP events, as well as other types of ENSO disturbances (e.g., La Niña and Central Pacific El Niño/Modoki) affect climate on a basin-scale: impacts throughout Pacific watersheds propagate through hydrological systems to ultimately affect the coast. I examine ENSO's water-related risks and opportunities from a basin-wide perspective, considering how this climate system may have interacted with other climatic and environmental systems to alter conditions at the coast. This kind of broader spatial and temporal perspective positions us to consider how different types of ENSO events may have presented different suites of challenges and opportunities and affected past societies' ability to predict, plan for, and respond to the short- and long-term changes ENSO wrought on local climates.

**Leclerc, Elizabeth (University of Maine)**

[165]

*Discussant*

Leclerc, Elizabeth [88] see St. Amand, Frankie

LeCompte, Joyce [141] see Leonard-Doll, Katy

**Ledin, Lauren (University of Chicago) and Hongbin Yue (Chinese Academy of Social Sciences)****[32]**

*New Perspectives on Age in Early China: A Bioarchaeological Life Course Approach to the Late Shang Capital of Yinxu*  
Mortuary theory of early China commonly describes differences among graves and grave goods as indicative of differences in individuals' wealth and lineage affiliation. While early Chinese graves are well-explored from the perspective of archaeology, history, and art history, the skeletal remains found within them only became an important subject of study relatively recently in the history of research at many early Chinese sites, such as the UNESCO World Heritage Site of Yinxu in Anyang, China (ca. 1200–1050 BCE). Even with this new body of evidence, its benefit to researchers—including bioarchaeologists eager to implement aDNA and stable isotope analysis—is limited by a mortuary theory that never sought to include skeletal data in the first place. In this paper, I discuss bioarchaeological research on the skeletal remains of approximately 150 individuals excavated from a single lineage neighborhood at Yinxu, ranging from rarely studied infant remains to elderly adults. In analyzing the resulting age estimates through the lens of life course theory, I consider how a systematic understanding of age can either bolster or improve the extant mortuary theory for early China, and address ongoing questions related to kinship, personhood, and ancestor veneration.

**Ledin, Lauren (University of Chicago)****[32]***Chair***Lee, Christine (California State University, Los Angeles) and Cassandra Kuba (University of Pennsylvania)****[169]**

*Trade and Trauma along the Silk Road: The Evidence from the Western Frontier of China and Mongolia (700 BC–AD 420)*  
Four archaeological sites along the western frontier of China and Mongolia were analyzed for cranial trauma patterns. These patterns were then used to determine levels of violence, who were the participants, and if certain individuals were singled out as specific targets. Two sites Yingpan and Yanghai represent agricultural oasis states in the Tarim Basin. Two sites Nileke and Chandman were nomadic pastoralists along the Altai Mountains. Trauma patterns were analyzed for weapon type (blunt, sharp, or high velocity), and cause (interpersonal conflict, warfare, or other). The highest incidence of violent death occurred at Chandman and the lowest at Yingpan. Violence against females was highest in the oasis states with little evidence in the nomadic pastoralists. Yingpan had a specific pattern of trauma among men, women, and children which suggests participation in a contact sport such as polo. Nileke, and Chandman had evidence of trepanation, scalping, and facial mutilation. This is probably evidence of extensive warfare and corporal punishment within the region. This study supports historical and artistic documentation of athletic activity, the dangers associated with travel along trade routes, female public roles, and the carrying out of government-sanctioned punishments.

**Lee, Christine (California State University, Los Angeles)****[169]***Chair***Lee, Craig (Metcalf Archaeological Consultants & INSTAAR)****[127]**

*Melting Ice at the Crossroads of Culture and Climate Change*  
Archaeological and paleobiological “finds” at melting ice patches and glaciers can capture public imagination and create compelling narratives about responding to climate change. This paper will share an update on the current status of the field of ice patch archaeology based on talk themes at the recent “Frozen Pasts” conference, which is the international gathering for glacial and ice patch archaeology, as well as recent issues of the *Journal of Glacial Archaeology*. The program and abstracts from Frozen Pasts 5 are available here: <https://instaar.colorado.edu/meetings/frozenpasts5/program.html>.

Lee, Iris [109] see Gates St-Pierre, Christian

**Lee, Jordan (Northern Arizona University), Jaime Awe (Northern Arizona University) and W. James Stemp (Keene State College)****[95]**

*The Ideological Significance of Eccentric Lithic Caches from Ballcourt 2 at Xunantunich, Belize*  
The archaeological site Xunantunich was a prominent Maya polity in the Belize River Valley during the Late (600–700 AD) and Terminal (800–900 AD) Classic periods. Excavations in 2018 by the Xunantunich Archaeology and Conservation Project (XACP), a branch of the Belize Valley Archaeological Reconnaissance Project (BVAR), revealed four caches containing over 80 lithic eccentrics, stingray spines, and a two-lipped vessel that were deposited along the playing alley of one of the site's two ballcourts. Eccentrics are chert and obsidian objects that the Maya knapped into unusual, non-utilitarian forms that were often in the shape of zoomorphic or anthropomorphic figures. This collection includes ancestor profiles, centipedes, undulating lightning forms, and more. In this presentation, I describe the ideological significance of the variety of eccentric lithics from the caches at Ballcourt 2. My results suggest that the eccentrics were buried in the ballcourt to be used as supernatural offerings which protected ritually, politically, and architecturally significant spaces. Eccentrics may have been part of integrating Maya daily life with Maya cosmology and served to solidify political power among the rulers who likely commissioned the eccentrics. My research suggests that these offertory caches played an important role in symbolically reflecting Maya ideology at Xunantunich.

Lee, Laura [89] see VanPool, Todd

Lee-Thorp, Julia [29] see Santana Sagredo, Francisca

LeFebvre, Michelle [67] see Oliveira, Cristina

Lei, Xingshan [185] see Li, Jingbo

**Leight, Megan (West Virginia University)**

[130]

*Aspirational Elitism? Examining Inequality in the Material Record at the Port at Salinas de los Nueve Cerros, Guatemala*

How people traded and acquired goods in precapitalist societies has long presented a complex entanglement of social, political, religious, and economic considerations for archaeologists. The interconnectedness of ritual behavior, material culture, and economic exchange has allowed archaeologists to investigate some of the intangibles of culture including power, agency, and belief, particularly through analyzing the things of the past (following Antczak and Beaudry 2019). These things outlive the humans who created them and provide an opportunity to examine issues of inequality in the physical record, particularly utilizing theoretical approaches grounded in theories of embodiment and practice. This paper considers the things associated with commercial activity at the riverine port of Salinas de los Nueve Cerros in Alta Verapaz, Guatemala, to address economic inequality, particularly through analyzing the material assemblages and built environment. Items of interest are classes of goods identified as imitations of elite materials, particularly imitation ceramic wares and greenstone beads. These objects indicate an aspirational elite group of merchants and vendors were localized at the commercial hub of Nueve Cerros, which contrasts with the industrial salt production zone and the elite burials of the administrative zone previously examined at the site.

**Leishman, Deborah and Jean Pike (Architecture/Landscape CoLAB)**

[208]

*Determination of Pueblo Bonito's Function: A Quantitative Methodology*

We previously presented work on development of a methodology for the quantitative analysis of precontact architectures. The methodology utilizes Bayesian Networks and a large set of architectural attributes to quantify the similarity of formal building types. Specifically, we analyzed McPhee Pueblo, Colorado, and the large Hohokam ballcourt at Snaketown, Arizona, for their similarities to Pueblo Bonito ca. AD 850–900. The method uses attributes within the categories of form, space, and site and showed that both sites have significant similarities to Pueblo Bonito. We also described a method to determine the functions of Pueblo Bonito using these similarities. That work was preliminary, combining form and space attributes to provide a probability of functions related to ceremonial, domestic or storage. We expand on that work here, to consider more completely the determination of possible functions of Pueblo Bonito, again utilizing Bayesian networks and architectural attributes. In particular, we consider (1) utilizing site attributes such as presence of roads, as well as form and space attributes; and (2) different ways of combining the architectural attributes outside of the categories of form, space, and site. The results point to a method that quantitatively defines function based on similarity.

**Leiss, Amanda (Yale University), Michael Rogers (Southern Connecticut State University) and Sileshi Semaw (Centro Nacional de Investigación sobre la Evolución Humana)**

[90]

*Paleoenvironmental Reconstructions of Gona, Ethiopia, between 3 and 1 mya: Evidence from Faunal Analysis*

The environmental context of the Plio-Pleistocene, specifically between 3 and 1 Ma, is important for understanding major technological, behavioral, and anatomical transitions in the evolution of early *Homo*. Due to the scarcity of deposits in the archaeological record, especially during the 2.8–2.3 Ma time range, little is known about the paleoenvironment(s) during this timeframe. Gona, Ethiopia, has fossil and archaeological deposits spanning the past ~6.4 million years and arguably the longest continuous record of Early Stone Age (ESA) archaeology in the world, including the earliest confirmed evidence of carcass processing in the archaeological record (Semaw et al. 1997, 2003; Domínguez-Rodrigo et al. 2005) and among the earliest Oldowan and Acheulian assemblages. The origin of the Oldowan and appearance of the Acheulian industrial complexes were significant for early hominin ecological adaptations and Gona provides a unique window for examining the context in which these changes occurred. This study analyzes >2,000 fossil specimens from >30 localities in the Gona study region dated between 3–1 Ma. Community assemblage data provide evidence for a heterogeneous landscape through time. These paleoenvironmental reconstructions provide unparalleled context for the Early Stone Age assemblages at Gona and insights into hominin-environment interactions of early stone tool use.

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

[112]

*Discussant*

**Lemuz, Carlos and Roger Cossio**

[87]

*Tecnología prehispánica de reservorios de agua en la cuenca del Río Desaguadero, Bolivia*

This paper summarizes the advances in archaeological research on the management of water in artificial reservoirs called Qhotañas or Qochas in the region located north of the Desaguadero River, the framework of cultural, ideological and social development that involved the use of this technology is discussed, preliminarily interpreted from regional studies in the Jesús de Machaca area and

intensive and extensive excavations carried out in the monumental settlement of Khonkho Wankane. The development of questions about the productive use and management of resources within the framework of these artificial features is deepened, comparing their development with that observed in other places in the eastern and northern basins of Lake Titicaca.

**Lensink, Stephen and Joseph Tiffany (University of Iowa)**

[52]

*Dating the Origins of Village Life on the Eastern Plains*

Exploration of potential connections between the societies of the Eastern Plains and Cahokia offers opportunities for understanding interactions involved in the emergence of fortified villages following corn-centered agricultural subsistence-settlement adaptations. New high precision AMS radiocarbon results from three sites, including 13PM7, as well as the reanalysis of the conventional radiometric dates from additional sites, indicate that this settlement system transition occurred in northwest Iowa broadly between AD 1060 and 1160. The use of ceramic cross-dating further substantiates this transition as beginning during the Lohmann phase and ending in the appearance of nucleated villages by the early Stirling phase. Both AMS and cross dating point to a very rapid implementation of nucleation and fortification taking place during the period from AD 1140 to 1160, suggesting a fundamental societal reorganization within a single generation.

**Lentz, David (University of Cincinnati), Nicholas Dunning (University of Cincinnati), Vernon Scarborough (University of Cincinnati), Stephanie Meyers (University of Cincinnati) and Trinity Hamilton (University of Minnesota)**

[48]

*The Fall and Rise of the City of Tikal in the Maya Heartland*

The volcanic eruptions of ca. 536 CE cast a dark pall over the political and economic fortunes of Tikal, one of the leading polities of the Lowland Maya, and its Mexican ally to the north, Teotihuacan. The latter city declined in the mid-sixth century, and Tikal was defeated by the forces of the Kaan Dynasty of Calakmul and its allies in 562 CE. For Tikal this led to a century-long downturn known as the "hiatus." Prior to this tragic loss, there were already signs at Tikal that trouble was on the horizon. In the mid-fifth century, the construction of an apparent defensive wall was initiated and the development of well-protected agricultural field systems began. Following the hiatus, Tikal regained its economic and political primacy and pursued an unprecedented period of palace, temple, reservoir, and municipal park construction that became the hallmarks of the Classic period. Toward the end of this period, however, some of the main reservoirs were badly contaminated with mercury, organic debris, and toxic cyanobacteria, thus hastening the departure of the Maya from the site core of Tikal.

León, Gabriel [221] see Meinecke, Helena

Leon, Mike [141] see Lyons, Natasha

Leon, Roma [141] see Lyons, Natasha

**Leonard-Doll, Katy (Washington State University, University of Washington), Sara Gonzalez (University of Washington, Burke Museum), Ian Kretzler (Cultural Resource Consultants) and Joyce LeCompte (Camassia Resource Stewardship)**

[141]

*Grand Ronde Foodways: Survivance and Food Sovereignty on the Grande Ronde Reservation*

The Grand Ronde community has a complex and long-standing connection with the landscape particularly in regards to foodways. The Indigenous groups forced to relocate onto the Grand Ronde reservation had varying foodways practices that had to be adapted to the resources available and accessible in the face of ongoing settler colonialism. Through stories of survivance and ongoing revitalization of traditional food practices, the community continues to emphasize the importance of traditional foodways today. The Field Methods in Indigenous Archaeology (FMIA) field school has approached Grand Ronde foodways through the archaeological record with what Natasha Lyons and Kisha Supernant (2020) call "a heart-centered approach," which centers the partnership with the Grand Ronde community and incorporates discussions with community members along with surveys, excavations, and archaeobotanical analysis. Through a combination of these methods, the FMIA team has identified evidence of both continued and new relationships with food resources in the past including a potential long-term "food forest." This partnership highlights how foodways permeate many aspects of the Grand Ronde community's traditions both past and present through a more informed archaeological practice of Indigenous foodways on the Grand Ronde reservation.

**Leroy, Stéphanie (LAPA-IRAMAT, NIMBE, CEA, CNRS, Université Paris-Saclay), Mitch Hendrickson (University of Illinois), Enrique Vega (LAPA-IRAMAT, NIMBE, CEA, CNRS, CEA Saclay) and Quan Hua (Australian Nuclear Science and Technology Organisation)**

[181]

*Following the Recipe: Using pXRF to Track the Evolution of Iron Smelting Practices during the Rise and Fall of the Angkorian Khmer Empire, Cambodia*

Recent investigations of iron smelting in Angkorian Cambodia have focused on object-based analysis to reveal patterns of diachronic exchange between the ninth to the fifteenth centuries. While this work demonstrated shifts in the intensification and nature of iron production during Angkor's peak in the twelfth to thirteenth centuries, less attention has been given to identifying the smelting recipes (techniques, resources) employed by producers through space and time around Phnom Dek and Preah Khan of Kompong Svay. By compiling a vast database comprising in-field pXRF slag compositional data, chronological data, and

archaeological survey evidence from 156 slag concentrations it is possible to undertake a holistic metallurgical analysis capable of recognizing technical choices and even sporadic tests. Our results show important shifts in resource selection and skill that relate to political fluctuations of the Angkorian state. This new, integrative approach is offered as a model for describing a posteriori production behaviors that took place in Cambodia over a period of 1,400 years.

Lertchamrit, Thanik [157] see Palefsky, Gina

Lesage, Louis [223] see Birch, Jennifer

**Leslie, David (Archaeological and Historical Services Inc.) and William Ouimet (University of Connecticut)**  
[105]

*Repeated Paleoindian and Early Archaic Occupations at the Brian D. Jones Paleoindian Site in Avon, Connecticut, between 12,500 and 9,000 Years Ago*

Excavations in 2019 at the alluvially buried Brian D. Jones (BDJ) Paleoindian Site indicated at least three stratified, repeated occupations during the Paleoindian and Early Archaic periods, based on site stratigraphy and a single radiocarbon date from a hearth. Twenty-five new radiocarbon dates were processed from 22 cultural features and soil contexts, to better constrain site occupations. Geomorphological work at BDJ has focused on modeling site sedimentation through high-resolution analyses of vibracore soil profiles, including ICP-MS, pXRF, LOI, and stable isotope analyses of soils. These radiocarbon dates provide evidence for at least six separate occupations at the site that span the Early, Middle, and Late Paleoindian as well as the Early Archaic periods. Here, we discuss these new dates, and present them with updated lithic identifications, spatial and geomorphological analyses, and environmental indicators, providing a more thorough analysis of Terminal Pleistocene and Early Holocene occupations at the BDJ site.

Leventhal, Alan [18] see Tushingam, Shannon

**Leventhal, Richard (University of Pennsylvania)**  
[188]

*From Settlement Patterns to Biographies of Space: New Directions*  
[WITHDRAWN]

Leventhal, Richard [25] see Seyler, Samantha

**Levi, Laura (University of Texas at San Antonio) and Cady Rutherford (University of Texas at San Antonio)**  
[210]

*Ritual Encounters: Maya Classic Period Political Landscapes in Northwestern Belize*

It is traditional for archaeologists to interpret lowland Maya temple pyramids as loci of ritual activity. Archaeologists also draw a close connection between temples and the exercise of political authority—unless of course the temples in question have been found beyond precincts of monumental architecture in so-called “shrine groups.” In the latter case, temples are argued to index a narrow suite of domestic rites associated with ancestor veneration. But there is good reason to question the assumptions underlying this argument: first, that Maya domestic rites tended to be singular in purpose and uniform in practice; and second, that it was possible for ritual performance to proceed in the absence of an authorizing hand. These concerns will be explored using data from two ancient Maya communities in northwestern Belize. Here, a set of residential temples suggests a new way forward in the study of lowland Maya power politics.

**Levi, Laura (University of Texas at San Antonio)**  
[210]

*Chair*

**Levin, Maureece (Valdosta State University) and William Ayres (University of Oregon)**  
[154]

*Mangroves in Micronesia: The Liminality of Human Settlement in the Northern Tropical Pacific*

Human settlement in much of central-eastern Micronesia can be characterized by its liminality. From an ethnographic perspective, crossing the land-sea boundary is a regular and necessary act of daily existence for people living on both high (volcanic) and low (coral) islands. Fishing, marine hunting, and the cultivation of domesticated tree and root crops are crucial parts of life. Forests of *Rhizophora* mangroves mark this liminal environment, encouraging exploitable marine life and dampening the impacts of ocean waves and winds on the terrestrial environment. Here, we take a diachronic approach to understanding the importance of mangrove forests in the historical ecology of Micronesian settlement, drawing on case studies from the high island of Pohnpei and the coral atoll of Pingelap. Engaging a multiproxy dataset, we explore the record of people making a home and a living in these liminal environments for up to 2,000 continuous years. We suggest that mangrove forests, which were not an unfamiliar environment to the first people to arrive in Micronesia, played a key role in humans' coastal settlement focus in the region.

Lévy, Jessica [70] see Peters, Ann

**Lewandowski, David (Logan Simpson)****[144]***The Social Networks of Classic Period Decorated Mimbres Pottery*

This paper uses the neutron activation analysis (NAA) dataset that has been compiled for decorated pottery within the Mimbres region in order to conduct social network analysis (SNA) for the Classic period (AD 1000–1130). The NAA dataset for the Mimbres region identifies compositional groups and probable production locals for Mimbres pottery. The use of NAA data to build social networks allows for previously established SNA methods to be used within a region and temporal period that lacked diversity in ceramic wares. Recent Mimbres NAA and pottery studies provide a context of production, distribution, and social significance from which the social networks can be viewed. This study uses network analysis to examine the distribution of decorated pottery across the Mimbres region, identifies subregional networks, explores site centrality within the network, and examines the geospatial relationship of sites within the network. The paper also explores and demonstrates the applicability of SNA as an additional tool for examining the production and distribution of pottery within the Mimbres region, as well as the viability of NAA data for building such networks.

**Lewis, Brandon (Santa Monica College), Rui Mataloto (Municipality of Redondo, Portugal), Alanna Anglin and Hugo Miranda de Morais (Municipality of Redondo, Portugal)****[108]***Excavation of the Roman Basilica at Freixo, Portugal: Roman Imperial Expansion and Decline in the Southern Iberian Peninsula and Post-collapse Christianity*

The Freixo Archaeological Project represents a joint international research program aimed at elucidating the nature of Roman Imperial occupation and decline in the southern Iberian Peninsula. Specifically, we are interested in the degree to which this hinterland community may shed light on the decline of Roman authority in southern Portugal and provide critical insights into the organization and practice of Christianity in the subsequent centuries of Germanic and Visigoth occupation. Five field seasons of investigation at the Freixo basilica are beginning to generate provocative and detailed data regarding the historical trajectory of this rural community and the continued Christian reuse of the basilica after the collapse of Roman Empire. Substantive data will be presented regarding the organization, chronology, and surprising wealth of the rural community and associated basilica. In addition, preliminary interpretations will be forwarded regarding the religious implications of the associated burials, most of which appear to postdate primary basilica abandonment. This research provides substantive contributions to our regional understanding of Roman Imperial occupation and decline in southern Portugal and, at the same time, hopes to shed light on the complex organization and practice of Christianity post-Germanic invasion.

Lewis, Cecil [173] see Haffner, Jacob

Lewis, Marcus [140] see Katz, Steven

**Lewis, Michael (Confederated Tribes of Grand Ronde), Briece Edwards (Confederated Tribes of Grand Ronde), Chris Bailey (Confederated Tribes of Grand Ronde), Cheryl Pouley (Confederated Tribes of Grand Ronde) and Nicolas Atanacio (Confederated Tribes of Grand Ronde)****[140]***Does That Belong in a Museum? Western Oregon Decorated Stone Bowls as Funerary Objects: A Pilot Study***[WITHDRAWN]**

Lewis, Michael [114] see Edwards, Briece

**Li, Jingbo (Stanford University), Xianglong Chen (Chinese Academy of Social Sciences), Jianrong Chong (Shaanxi Academy of Archaeology), Xingshan Lei (Capital Normal University) and Li Liu (Stanford University)****[185]***Foodways in the Early Zhou Capital: Residue and Isotope Study of the Zhouyuan Site (~3000 yr BP) in Shaanxi, China*

Zhouyuan was the cradle of the Zhou civilization in the Bronze Age of China, located in the Guanzhong Plain in Shaanxi Province. Food and drink played a key role in the stratified society and the new complexity after the collapse of Shang. However, little direct archaeological evidence has allowed us to understand the foodways in Western Zhou, making many utensils hard to be contextualized. Here we present the first residue study of starch and phytolith on the food and drinking vessels from the sites of Zhouyuan, combined with the data from stable carbon and nitrogen isotopes of human and animal bone collagen. These findings indicate that crops such as millet had taken a significant place in human diet and animal husbandry, even in the production and consumption of alcohol. In addition, wheat was possibly used for alcohol fermentation in daily life and ritual sacrifices. The subsistence and foodways in Zhouyuan were influenced not only by a regional natural environment and ecology, but also by the cultural environment that was of Zhou 3,000 years ago.

**Li, Yung-ti (University of Chicago), Changping Zhang (Wuhan University), Zhuo Sun (Wuhan University) and Qiushi Zou (Wuhan University)****[185]***Colony or Hegemonic Center? Repositioning Panlongcheng to Its Regional Context*

The Middle Bronze Age site of Panlongcheng, dating to the sixteenth–thirteenth century BCE and situated in the Middle Yangzi River Valley near Wuhan, Hubei, China, is long considered an outpost or colony of the Central Plains based Erligang civilization. It is

hypothesized that Panlongcheng was established by Erligang, 500 km north, to secure control over mineral resources such as copper in southern China. While the material culture, mortuary practices, and the style and layout of the architecture clearly speak for the affinity of the two, Panlongcheng as a settlement of itself was rarely examined in the local regional context. Since excavations resumed in 2013, archaeologists have focused on reexamining the nature of Panlongcheng. The richly furnished elite tombs and the large number of bronzes found suggest that it could well be a hegemonic center that collaborated or even competed with Erligang. What was the function of Panlongcheng, especially since there is no evidence of the nearby copper mines being exploited contemporaneously? Was Panlongcheng established in this particular location due to geographic and strategic reasons? What were the resources, mineral and agricultural alike, that attracted the settlers to Panlongcheng? The paper intends to explore these questions to provide different interpretations.

Li, Zhipeng [158] see Hirai, Nina

Libbon, Jonathan [113] see Burnett, Paul

Lieb, Brad [8] see Krus, Anthony

**Liebmann, Matthew (Harvard University)**

[223]

*Discussant*

**Lillios, Katina (University of Iowa), Rebecca Gallagher (University of Iowa), Jonathan Thomas (University of Iowa) and Logan Moore (University of Iowa)**

[20]

*2D Morphometrics, Craft Production, and the Engraved Slate Plaques of Copper Age Iberia*

During the Copper Age of Southwest Iberia (3000–2500 BCE), diverse social identities were materialized by personal adornments made from an array of raw materials. Among these objects are slate plaques engraved with standardized patterns of geometric designs. Nearly 2,000 plaques have been recovered from around 300 collective burials in SW Iberia. Much attention has been devoted to the plaques' possible meanings and functions; archaeologists have suggested they were heraldic emblems, a writing system that recorded the identity and genealogies of an elite class of the dead, or representations of a deity. Less attention has been devoted to understanding the organization of the plaques' production. This paper builds on our previous research (Thomas et al. 2009; Woods and Lillios 2006), which demonstrated that the application of a 2D morphometrics approach correctly grouped a set of the same replica plaques by producer only slightly better than the Morellian method (75% versus 67%). Here, we compare the results of these two methods on differently designed plaques made by a set of known engravers using more current 2D morphometrics software. Improving our ability to identify individual plaque engravers may enable archaeologists to assess the validity of the genealogical model.

Lillios, Katina [108] see Soares, Justin

Linares-Grados, Moises [51] see Eerkens, Jelmer

Lindley, Tiffany [54] see Cap, Bernadette

**Lindquist, Shayna (University of Kentucky) and Gabriela Montero (University of Kentucky)**

[145]

*Analyzing PAMLAS Obsidian: Lithic Technology at the Site of La Sierra*

The analysis of chipped stone artifacts is an effective method with which to study a variety of behaviors, ranging from household activities to interregional interaction. The use of certain obsidian sources and technologies has also been used as indicators of temporal periods. In the Eastern Lower Papaloapan Basin (ELPB), the Recorrido Regional Arqueológico de Tres Zapotes (Pool and Loughlin 2014–2017) recovered obsidian artifacts which, in addition to ceramic data, are potentially informative of temporal periods that have not been widely studied, such as the Postclassic period. This paper contextualizes the excavated obsidian assemblage from La Sierra to the regional obsidian industry, focusing particularly on a scraper technology. We argue that these scrapers were used in processing ixtle, and that textile production in the ELPB region combined with the presence of spindle whorls, is an indicator of Late Classic to Postclassic occupation. We discuss the potential implications this could bring to Gulf Coast prehispanic lithic studies.

**Lindsay, Audrey (Shumla Archaeological Research & Education Center)**

[146]

*A Formal Analysis of the Pecos River Style Winged Anthropomorph in the Lower Pecos Canyonlands, Texas*

Pecos River-style rock art includes stylized anthropomorphic, zoomorphic, and abstract enigmatic figures composed into complex, multilayered compositions. The winged anthropomorph figure combines repeated and in some cases conventionalized attributes from both anthropomorph and zoomorph figure types. This paper utilizes the Shumla Archaeological Research & Education Center's

Alexandria Project Archive to complete a formal analysis of the winged anthropomorph figure in Pecos River style. To complete my formal analysis, I queried Shumla's Rock Art Site Form database, locating 23 rock art sites with a total of 58 winged anthropomorph figures. I used the associated high-resolution imagery from these sites to identify, classify, describe, and illustrate the attributes of each winged anthropomorph and its context within the mural. I then plotted the identified sites with winged anthropomorphs using geographic information system (GIS) to examine their distribution across the landscape. This formal analysis will facilitate interpretive analyses of the winged anthropomorph and its context within Pecos River style, specifically its possible identities, relationships, and/or roles within narratives of Pecos River-style murals.

**Lindsay, Audrey (Shumla Archaeological Research & Education Center)**

**[146]**

*Chair*

**Linford, Samantha**

**[41]**

*We Found the Schist! An Archaeology Adventure from Tijeras to Los Alamos*

Communities of practice are important in learning about archaeology, but also apply to how archaeology is taught. Reflecting on the inspiration of Dr. Habicht-Mauche the communities of practice that I have participated in and learned from have influenced my personal trajectory in Southwest archaeology and the types of research questions I ask. How we go about archaeology is often as important as what we focus on in terms of research. I hope to highlight how Dr. Habicht-Mauche has influenced my trajectory and how it speaks to the greater field of Southwest archaeology.

**Lippert, Dorothy (National Museum of Natural History), Desiré Martínez (Cogstone Resource Management) and Michael Wilcox (Stanford University)**

**[66]**

*Reflections on and Further Assessment of Archaeologists' Knowledge about Tribes and Heritage: An Interactive Poster*

Many archaeologists working with tribes may not have taken courses dealing with Native American sovereignty, tribal governance, legislative history or American Indian law. This has impacts on their practice of archaeology and has hindered their ability to be collaborative. In a previous poster session, we assessed levels of knowledge and identified topics that have been overlooked in archaeological education. We will present our findings and continue to playfully engage with our colleagues to determine areas in which more education is needed and determine how best to provide information for our colleagues.

**Lippert, Dorothy (National Museum of Natural History)**

**[195]**

*Discussant*

Lippitt, Christopher [78] see Kirk, Scott

Lipps, Hannah [40] see De La Puente-León, Gabriela

Lira, Yamile [209] see Ruiz, Judith

**Lira-Lopez, Yamile**

**[201]**

*La cultura material de una unidad habitacional del periodo Clásico en el Valle de Maltrata, Veracruz*

Las investigaciones realizadas por el Proyecto Arqueología del Valle de Maltrata, Veracruz, han revelado la importancia y función del valle como una ruta de comunicación entre la Costa del Golfo y el Altiplano central desde el Pleistoceno hasta nuestros días. Durante el periodo Clásico, fue particularmente relevante pues hemos evidenciado la presencia de cerámica y obsidiana con estilo teotihuacano, por lo cual el valle fue utilizado como una ruta principal de comercio de Teotihuacan hacia el sureste, dejando parte de su cultura material en el valle de Maltrata. El asentamiento de Rincón de Aquila, es uno de los mejor conservados y extensos registrados en el valle. Las excavaciones extensivas realizadas en un espacio de terrazas, al sur de las estructuras monumentales, permitieron descubrir elementos constructivos y evidencias culturales que evidencian la presencia de una unidad habitacional. En esta presentación se expone el análisis de los materiales culturales encontrados en espacios con funciones diferentes: dos enterramientos, dos fogones, un basurero, parte de una estructura, un piso de estuco. Con ello podemos caracterizar temporal y culturalmente una unidad habitacional de una región donde los estudios arqueológicos son pocos, concentrándose la arqueología de la Costa del Golfo en regiones como Tajin y olmecas.

Lisa, Laher [117] see Macdonald, Danielle

**Lisboa, Rafaella****[79]***The Central Role of Fiber on Isla Cedros: Crafting the Earliest Maritime Hunter-Gatherers of Baja California*

This research highlights the central role of fiber production in the early maritime societies of Baja California by exploring the lithic and shell tool technologies of Isla Cedros. Quantitative analysis methods are applied to archaeological data from three of the earliest occupation sites on Isla Cedros. This study focuses on the use of fiber by examining the technological traditions associated with maritime subsistence practices of Terminal Pleistocene/Early Holocene Isla Cedros. Putting fiber at the center of archaeological inquiry helps close the gap between the fishhooks and the person who fished; it helps bridge the gap between variety of fish species we find in the archaeological record and the people who worked together to gather them and who ate them. Archaeological data from the Terminal Pleistocene/Early Holocene occupation of Isla Cedros shows an archaeological pattern indicative of a well-established technological organization focused on marine resources and fiber production. This suggests that the focus on marine resources is not the result of an adaptation driven by lack of terrestrial resources, but rather an ever-present maritime culture. The archaeological record of Cedros Island offers incredible opportunities for contemporary methodological approaches that help tell a more holistic and inclusive story of the first Americans.

Littman, Robert [106] see Silverstein, Jay

**Liu, Chin-hsin (California State University Northridge)****[193]***From Points to Spectra: Reconnecting the Biological and Social Lives of an Individual in Early Central Thailand***[WITHDRAWN]****Liu, Hailin, Xin Yu and Chunxue Wang****[158]***Zooarchaeological Research on Shipwreck Remains of the Maritime Silk Road: A Case Study of the Shipwreck Site in Zhangwan, Tianjin, China*

The Tianjin Zhangwan shipwreck site is located in Shuangjie Town, Beichen District in Tianjin. In April 2012, the Cultural Heritage Protection Center in Tianjin had conducted an archaeological exploration and rescue archaeological excavations at this site. The excavation area was 550 m<sup>2</sup> and three shipwreck remains were discovered. Archaeological scholars collected many remains, such as ceramics, metallic and wood artifacts, human and animal bones. According to the accumulation layer and the age of excavated artifacts, it can be inferred that the age of shipwreck remains is from Yuan to Ming Dynasty. According to the analysis of animal bones, it shows that people in canal voyage used mammals as the main food, especially domestic pigs as the main source of food, followed by some mussels and fish. In addition, there may be the phenomenon of raising dogs and cats as pets at that time.

Liu, Hailin [158] see Yu, Xin

Liu, Li [185] see Li, Jingbo

Liu, Siran [32] see Wang, Qingzhu

**Liu, Xinyi (Washington University in St. Louis)****[185]***Effects of Novel Environments on Domesticated Species: A Case of the Hexi Corridor*

Between ca. 8,000 and 3,500 years ago, a period of early globalization had brought together previously isolated domesticated plant and animal species into hitherto uninhabited environments, hence establishing a new kind of farming system involving both indigenous and novel domesticates that were newly introduced. One such example involved the trans-Eurasian exchange of domesticated cereals, various wheat and barley taxa spread from their center of origin in southwestern Asia into East Asia, while domesticated broomcorn and foxtail millet dispersed in the opposite direction: from northern China to southwestern Asia and Europe. The Hexi Corridor was at the crossroad of this period of early globalization. While the movements of plant and animal domesticates across different environments are well documented in the archaeological record, what is less known is the precise mechanism that the prehistoric communities employed to adapt novel domesticates in new environments or into the long-standing local practices. In this article, I explore the effects of new environments (physical and cultural) on domesticated species. I will use archaeological examples from the Hexi Corridor, northwest China to illuminate the delights (and flaws) of farming and herding communities at the crossroad of farming dispersals.

**Livesay, Alison (Los Alamos National Laboratory)****[66]***A Real Labor of Love: Archaeologies of the Heart at Los Alamos National Laboratory*

The events of 2020 and 2021 have provided ample time for reflection both personally and professionally. I have examined the impacts and opportunities posed by my work as an archaeologist practicing at Los Alamos National Laboratory. I focus on some collaborative projects that operate within or are informed by a heart-centered approach and have had a profound effect on my career: the Vigil y Montoya homestead and various outreach projects with Pueblo and Hispanic students. Without oversimplifying, a heart-centered framework creates space to bring our whole selves (not just the objective mind) to bear on research projects. It also

allows us to consider the powerful roles that emotion, love, relationality, and connection play in our research without necessarily sacrificing scientific rigor. I highlight both the successes and struggles I have encountered in my intimate work with students, the public, and descendant communities. This reflection aims to continue the discourse concerning the greater relevancy and trajectory of the discipline as a whole, and help to refine best practices as we continue to do archaeology together.

Livingood, Patrick [65] see Hammerstedt, Scott

**Liwoz, Chester (Mesa Prieta Petroglyph Project)**

[41]

*Northern Rio Grande Public Archaeology: The Mesa Prieta Petroglyph Project*

Professor Habicht-Mauche is well-known for teaching using experimental archaeology, and her scholarship has significantly enriched our understanding of the nuances of Plains interactions with the Eastern Pueblos. Residing on this very same frontier along the Northern Rio Grande, Mesa Prieta is a striking 50 square mile landmark of great cultural significance to the Tewa Pueblos, their Northern Tiwa and Jicarilla Apache neighbors, and other area communities. The nonprofit Mesa Prieta Petroglyph Project (MP3) currently estimates that Mesa Prieta (Tsjkwayè in Tewa) hosts around 100,000 petroglyphs, making it one of the densest and most prolific rock art landscapes in North America. MP3 engages with local, Pueblo, and scientific communities to further its mission of preserving Mesa Prieta's cultural heritage through recording and educational programming. On behalf of MP3 I am pleased to share a summary of our recent and current public programming that connects the visual and material culture of this place with primary school, high school, and adult audiences. To accompany this poster I will also be sharing some hands-on visual aids including the tools our citizen-scientists use, virtual heritage management examples, and in the spirit of Dr. Habicht-Mauche's work and teaching some archaeology experiments included in our educational programming.

**Liwoz, Chester (Mesa Prieta Petroglyph Project)**

[211]

*Discussant*

**Llobera, Marcos, Grant Snitker (Oak Ridge Institute for Science and Education), Gabriel Servera-Vives (UNIMORE), Joan Fornós-Astó (Universitat de les Illes Balears) and Lluís Gómez-Pujol (Universitat de les Illes Balears)**

[108]

*Reading across the Lines: A Multiproxy Reconstruction of Human-Environmental Interaction in a Western Mediterranean Landscape (Mallorca, Balearic Isles, Spain)*

The Landscape, Encounters and Identity Archaeology project (LEIAp) is a research project centered on the municipality of Son Servera (NW Mallorca, Balearic Islands, Spain). Among its objectives are conducting an intensive surface survey, collecting information to reconstruct long-term fire regimes, paleoenvironment (pollen, non-pollen palynomorphs, and sedimentology) and current geomorphology for the study area. In the following presentation, we compare the results from 2014–2018 intensive survey side by side with paleo-fire and palynological studies in order to shed some light on interaction between the inhabitants of the Serverine landscape (from the Late Bronze Age, ca. 1500 BCE, through the Medieval period, ca. 1500 CE) and their environment. This study represents the first attempt to integrate a high resolution paleoenvironmental study with an intensive archaeological survey of a landscape in Mallorca.

**Lloyd, Amanda (Northern Arizona University), Kelley Hayes-Gilpin (Northern Arizona University) and Leszek Pawłowicz (Northern Arizona University)**

[113]

*Virtual Applications in Southwest Public Archaeology: Digital Platforms, Access, and the Effects of a Pandemic*

This project explores the effects of the COVID-19 pandemic on public archaeology, heritage management, and education in the Southwest. Digital tools such as 3D photogrammetry modeling, reflectance transformation imaging, educational videos, and virtual tours are translating experiential archaeology into online visualization and education, encouraging multi-access public engagement. This research focuses on public sites in north-central Arizona, with emphasis on the National Park Service (NPS) Flagstaff Area National Monuments. Study methods include statistical analysis of recreational visitor data and public forum reviews between 2017 and 2021, summarizing pandemic impact before and during lockdowns and restricted re-openings. Supplementary expert interviews from heritage management personnel elucidate details of problem-solving techniques in these public venues during a pandemic, digital applications for the future of archaeo-tourism, and considerations for ethical concerns in digital humanities studies. Results are shared with the public in visual and auditory settings through the Walnut Canyon Nine Room Virtual Tour Project and a podcast of stakeholder discussions.

Lobato, Thomas [91] see Sheffield, Anne

**Locker, Angelina (George Mason University), Fred Valdez Jr. (University of Texas at Austin), Daniel Breecker (University of Texas at Austin) and Catherine Schmidt (University of Texas at Austin)**

[209]

*A Tale of Two Cities: Migration, Violence, and Collapse at Kichpanha and Colha, Northern Belize*

Climate change, violence, famine, population growth, and migration have been suggested as catalysts for the collapse of Classic Maya civilization. It is clear that the transition from the Classic to the Postclassic affected various regions differently. In this paper, we present results from stable oxygen isotope measurements from 65 individuals to assess migration through time at the ancient

Maya community of Kichpanha in northern Belize. Suspected to be an elite family settlement, occupation spans the origins of ancient Maya civilization during the Preclassic (1000 BC–CE 250) to the collapse of Classic Maya civilization in the Terminal Classic (CE 800–950). The aim here is to understand changes in living conditions (e.g., migration) leading up to site abandonment at Kichpanha, which occurred contemporaneously with an immensely violent event at the neighboring site of Colha in the Terminal Classic. We juxtapose the stable isotope data from Kichpanha with archaeological data from Colha to illuminate how two closely connected communities responded to stress and ultimately experienced abandonment.

Locker, Angelina [179] see Rabinowitz, Adam

**Lockhart, Jami (Arkansas Archeological Survey)**

[137]

*Discussant*

**Loebel, Thomas (Illinois State Archaeological Survey), John Lambert (Illinois State Archaeological Survey) and Matthew G. Hill (Iowa State University)**

[97]

*The Upper Mississippi River Valley Dalton Technocomplex*

Time-transgressive spread of the Dalton Technocomplex from the “classic Dalton” heartland in the Central Mississippi River Valley resulted in development of multiple, regional expressions of this archaeological phenomenon. Examples include Hardaway in the Southeast, Hi-Lo in the southern Great Lakes, San Patrice to the south, Golondrina to the southwest, and Meserve on the Great Plains. Regionalization probably relates to population growth, social packing, and its concomitant effect on group movement and connectedness. Another regional expression, defined here for the first time, is the Upper Valley Dalton complex, which appears around 9500 BP, primarily in the Mississippi River Valley in northwest Illinois, southwestern Wisconsin, and eastern Iowa. It is characterized by a distinctive, yet commonly misidentified point style, localized use of Galena and Prairie du Chien cherts, and other behavioral and technological linkages common within the larger Dalton Technocomplex.

**Loebel, Thomas (Illinois State Archaeological Survey)**

[97]

*Chair*

Loebel, Thomas [97] see Hill, Matthew

Loebel, Thomas [97] see Lambert, John

Loebel, Thomas [164] see Porubcan, Paula

Loendorf, Lawrence [101] see Castañeda, Amanda

**Lofaro, Ellen (University of Tennessee)**

[180]

*Discussant*

**Lohse, Jon (Terracon Consultants Inc.)**

[48]

*Sixth-Century Climate Change: A Political Ecology View of Turmoil and Reorganization in Early Classic Central America*

The period beginning in the early mid-sixth century AD and lasting for over 100 years was one of significant turmoil and political reorganization in the eastern Lowlands and elsewhere in Central America. To date, climate change has not been identified as a significant contributor to these changes, at least not in the way that mega droughts in the Late Preclassic and Late to Terminal Classic have been associated with regional collapses of different political networks. In this paper, I review the possibility that multiple explosive volcanic events triggered what scientists call the Late Antique Little Ice Age. Based on historic accounts from elsewhere, climatic modeling, and by using the Little Ice Age as an analogy, declines in temperature rather than precipitation are identified as the main consequences of this period that would have challenged agricultural production and regional sustainability. These sudden changes are difficult to see in environmental proxies that typically focus on precipitation but would have created political ecological opportunities for reorganizing regional networks, with implications for local site histories, agricultural intensification strategies, and even wholesale population movements.

Londoño, Ana [67] see LeBlanc, Megan

Longo, C. Midori [159] see Boutin, Alexis

**Longstaffe, Matthew (University of Calgary), Meaghan Peuramaki-Brown (Athabasca University) and Jillian Jordan (University of New Mexico)**  
**[210]**

*The Perils, (Borrow) Pitfalls, and Possibilities: Refining Chronologies of Residential Occupation and House Construction at the Classic Maya Townsite of Alabama, East-Central Belize*

**[WITHDRAWN]**

**Look, Cory (Brooklyn College), Erin Friedman (Hunter College) and Matthew Brown (Farmingdale State College)**

**[78]**

*Moving Past Climate Change Impacts on Archaeological Sites: How Advancing Digital Technologies Are Creating New Paths for Engagement*

A growing body of research has brought attention to projected loss and damages to cultural heritage due to climate change. At the same time, there is a growing list of archaeological sites and places of importance that have been heavily impacted and lost to extreme weather events. These two conditions form uncertainties over how to best manage risk for cultural heritage sites and lead to vague methods in how to best document and preserve sites and their material culture. To fill this gap, this paper compares advancements in digital technologies for archaeological analysis and identifies strategies cultural heritage managers can use to digitally preserve places of importance. The findings propose these methods can advance the documentation of cultural heritage and expand the scope of access to cultural heritage sites beyond physical visits.

**Look, Cory (Brooklyn College)**

**[78]**

*Chair*

Look, Cory [166] see Brown, Matthew

**Loomis, Sarah (Harvard University)**

**[209]**

*Sacrifice and Mortuary Treatment in Western Mexico*

Human remains at the ancient site of Teuchitlán (ca. 300 BCE—500 CE) in Jalisco, Mexico are often fragmentary and difficult to interpret. Yet burials at the monumental ceremonial core have features such as specific identity profiles (young men, children, and unusual physiologies); high value grave goods; and peri- and postmortem treatment involving violence, fire exposure, and the symbolic arrangement of remains—all suggestive of ceremonial, likely sacrificial, deaths and burials. This presentation will examine the sacrificial and mortuary practices found in ethnographic, ethnohistoric, and archaeological records of West Mexican societies to better understand the range of these practices, their ideological significance, and how they compare to the remains found at Teuchitlán. Sources consulted will include ethnographies of the Huichol, Cora, and Tepehuán, as well as ethnohistoric records such as the Relación de Michoacán.

López, Manuel [47] see Gil, Adolfo

**López, Rocío (MS)**

**[200]**

*Fire, Citations, and the Making of Place: The Earth Mound Landscape of Eastern Uruguay*

In this paper, I apply Materiality concepts and theories of citation and memory, in order to argue that since 4700 years BP at the India Muerta Wetland region in Southeast of Uruguay, processes of place-making, practices of citation, creation of meaning and identities, and the possibly unintended consequences resulting from these processes, were crucial in the material emergence and long-term temporality, spatiality and changes of East Uruguay earth mounds. Geoarchaeological literature shows that use of fire and its related practices carried out by the early inhabitants (ca. 5000 BP) of East Uruguay, played a crucial role in the materiality of the region and the making of places. Data shows a recurrent citation of practices involving fire in specific locations, and I consider that these were possibly part of diverse, recursive, and generational practices of dwelling, citation of past practices visible in the burned patches in the land, and therefore the returning to specific locations, which resulted in the creation of places. Ongoing changes both in the way people inhabited these places and their material surroundings, were consistently occurring, with transformations and reorientations taking place, as they engaged with surrounding materialities that were in a constant state of becoming.

López Aldave, Natali [9] see Whitlock, Bethany

López Bravo, Roberto [199] see Meanwell, Jennifer

López Bravo, Roberto [199] see Paris, Elizabeth

**López Camacho, Javier (Escuela Nacional de Antropología e Historia) and Kenichiro Tsukamoto (University of California, Riverside)****[188]***Journey to the City of Arts: Spatial Experiences and Emulation of Architectural designs at El Palmar, Mexico*

The ideational approach to the study of ancient city planning is one of Wendy Ashmore's enduring legacies in archaeological research. In the study of ancient Maya city planning, Ashmore and Sabloff state that politics and cosmology are the most prominent ideational foundations. They suggest that emulation of architectural designs is an outcome of political interactions among Maya dynasties. The Classic Maya dynasty of El Palmar is a case study. Hieroglyphic inscriptions describe that an El Palmar diplomat, Ajpach' Waal, visited Waxaklajuun Ubaan K'awil, the thirteenth ruler of the Copan dynasty for the negotiation of political alliances between Calakmul, Copan, and El Palmar in 726 CE. During his visit, Ajpach' Waal probably witnessed a construction project of the hieroglyphic stairway and remodeling of the ballcourt that took place in the city center of Copan. We suggest that his experiences and perceptions at Copan were materialized as an emulation of architectural designs at El Palmar's north outlying group, the Guzmán Group. The long journey from El Palmar to Copan over 350 km is also reflected in gift exchange.

**López Luján, Leonardo (Museo del Templo Mayor, INAH), Alejandra Aguirre Molina (Proyecto Templo Mayor, INAH) and Antonio Marín Calvo (Proyecto Templo Mayor, INAH)****[128]***Images of Huitzilopochtli at the Templo Mayor of Tenochtitlan: New Discoveries, New Ideas*

The disparity between the number of extant Tlaloc and Huitzilopochtli images is well-known. While effigies of the rain and fertility deity are omnipresent in Tenochtitlan painting, sculpture, and offerings, those of the solar war god are surprisingly rare, especially considering that he was the city's tutelary deity. H. B. Nicholson and E. H. Boone each thought this was due to a radical historical transformation. From a minor hunting god and tribal patron of a humble Nahuatl-speaking people, Huitzilopochtli gradually evolved into a state deity tied to the official ideology and administration of a burgeoning empire. Although somewhat risky to say, the mighty Huitzilopochtli in the historical sources was still a god in transition in the early sixteenth century. His features had not yet crystallized, as traditional rites offered differing images in many ceremonial contexts. This presentation analyzes various material allusions to Huitzilopochtli at the Templo Mayor in painting, sculpture, and, especially, the ritual deposits buried at the foot of the pyramid.

**López Mazz, José (Universidad de la República, Uruguay) and Federica Moreno (Universidad de la República, Uruguay)****[63]***Exploring Niche Construction in the Eastern Lowlands of Uruguay (4000 BP–Eighteenth Century)*

The episodes of human dispersal on the Atlantic coast of South America had to adapt technological capital to sensitive environments. These conditions were particularly decisive for the hunter-gatherers who occupied the lowlands of the Laguna Merín basin after the maximum transgressive (ca. 5500 BP). The so-called mound builders (*cerritos*) (ca. 4000–eighteenth century) associated with these changing environments started the process of the emergence of cultural complexity. As in other South American lowlands, the new theoretical-methodological perspectives for the analysis of the relationships between humans and the environment seek to better understand the mutual influences, as well as the dynamic mechanisms of ecological history. This presentation explores the methodological virtues of niche construction as a working hypothesis and an experimental model, capable of ordering in a single interpretive line archaeological information related to animal management, hunting techniques, work processes, anthropic landscapes, and social conflict. The work deepens the knowledge of the relationships and feedbacks of these processes, generally analyzed independently, but which together amplified human capacities to modify the sources of resources and the natural systems of these environments with high primary productivity.

**López Mazz, José (Universidad de la República, Uruguay)****[63]***Chair*

López Pérez, Raúl [48] see Tiesler, Vera

**Lopez-Picklesimer, Kirsten (Oregon State University and PaleoWest)****[70]***Chair***López Puértolas, Carlos (UNAM)****[155]***Understanding the Pigment Production System at Teotihuacan: An Approach from the Archaeology of Color*

The use of color is one of the cultural phenomena that characterizes Teotihuacan, the main city of the Classic period in Central Mexico (ca. AD 150/200–650). Through the application of pigment mixtures on mural painting, ceramics, lapidary, bone, textiles, and the human body itself, color endowed Teotihuacan reality with meanings. However, despite the ancient Teotihuacano's passion for color, knowledge about the production system of Teotihuacan pigments is scarce. This research conceptualizes color as a product derived from a complex productive system where social, economic, and cultural agents converge. This contribution investigates color using manufacturing instruments, pigment cores, and fragments of mural painting from several Teotihuacan contexts such as the palace complex of Xalla, Conjunto Plaza de los Jaguares or Conjunto Amanalco, through the theoretical and methodological premises of the archaeology of color and the archaeology of production. From this perspective, this research deals with questions concerning the raw materials and their mixtures, the instruments and manufacturing techniques, and their elaboration phases, as well as the variations and permanence of their technology within Teotihuacan's historical development.

**López Rivera, José Antonio (Escuela Nacional de Antropología e Historia), John Carpenter (Instituto Nacional de Antropología e Historia), Matthew Pailes (University of Oklahoma) and Guadalupe Sánchez (Instituto Nacional de Antropología e Historia)**

[176]

*Estudios preliminares del Presidio de Fronteras de los Apaches o Santa Rosa de Corodéguachi*

Cuando hablamos del Norte de México durante el periodo novohispano, es inevitable que se nos vengan a la mente dos instituciones que dejaron una huella imborrable en la región: la misión y el presidio. El presente trabajo tiene como propósito presentar los trabajos de prospección en superficie preliminares que se realizaron durante este año en el presidio de Fronteras también conocido como Santa Rosa de Corodéguachi, el cual, fue el primer presidio fundado en el territorio de Sonora pero lamentablemente es el menos trabajado arqueológica e históricamente hablando. El uso de vehículo aéreo no tripulado (VANT), documentos históricos y la arqueología nos permiten brindar datos relevantes respecto al presidio, como preámbulo a los trabajos de excavación.

**López Rojas, María, Guaria Cárdenes Sandí (University of Costa Rica) and Silvia Salgado González (University of Costa Rica)**

[125]

*Explotación de recursos botánicos en el sitio arqueológico Nuevo Corinto, Costa Rica*

En la arqueología costarricense, se ha considerado la agricultura de maíz como una de las principales prácticas de explotación de recursos de las sociedades prehispánicas después de 400 aC; ésta actividad se practicó en conjunto con otras estrategias como la recolección, la caza y la pesca. En el caso del sitio arqueológico Nuevo Corinto, los análisis de fitolitos indican los recursos silvestres que sus habitantes utilizaron desde el año 300 aC hasta el año 1200/1300 dC. Los resultados obtenidos señalan una variedad de zacates, bambúes, herbáceas, palmas y árboles, principalmente. Los datos sugieren el manejo de recursos botánicos con fines constructivos y alimenticios; de igual manera, la evidencia delimita un escenario hipotético de aprovechamiento mixto de recursos naturales.

**López Rojas, María**

[125]

*Chair*

**Lopez Varela, Sandra (UNAM)**

[64]

*Remastering Mexico's Past: A Countercultural Conception of Heritage to Achieve Social Justice or Political Gain*

On the 50th anniversary of the brutal and cowardly massacre of an unknown number of students at Tlatelolco, days before the opening of the 1968 Olympics in Mexico City, this tragic episode was incorporated into Mexico's history as intangible heritage, creating a national truth about the ideals of the students' movement and which is far from bringing the perpetrators to justice. To this declaration have followed a suite of political strategies by the first elected leftist government in Mexico which includes, moving the date of the foundation of the Aztec City of Tenochtitlán to 1321 and the removal of the statue of Christopher Columbus, a classified historic monument, and to be replaced by a controversial statue honoring Indigenous women. Basing the discussion on the extensive work of Tzvetan Todorov, it is argued here that the establishment of this new "policy of memory" not only opposes heritage federal laws and the findings of archaeological and historical research, it has set the ground for the emergence of a countercultural conception of heritage to achieve social justice, which illustrates how monuments and definitions of heritage are abused politically by totalitarian regimes and authoritarian democracies for political gain. (Sensitive images included)

**Lopez Varela, Sandra (UNAM)**

[64]

*Chair*

Lorenz, Carol [144] see Wheelbarger, Linda

Loso, Michael [113] see White, John

Louderback, Lisbeth [57] see Baka, Abby

Loughlin, Michael [145] see Pool, Christopher

**Loughmiller-Cardinal, Jennifer (University at Albany, New York)**

[89]

*The True Science of "Folk" Chemistry*

The knowledge of the ancient natural world wielded by the peoples we study never fails to impress. We marvel at how they knew to distill, extract, and refine to achieve potent substances. Although we study the contexts of the events where such intoxicants were consumed, we rarely stop to consider just how much knowledge was required to create these substances in the first place. Trial and error cannot adequately explain the complexities, especially for substances that could be toxic or lethal if mishandled. More importantly, what knowledge was in place that allowed these indulgences to happen in a safe manner? How were synergistic

relationships identified? The ancient “folk” chemical and physiological knowledge required, just for the substances that we know to have been used, necessitated an understanding of how to create, control, and enhance intoxicants and experiences should be highlighted in our studies of mind-altering substances.

Loughmiller-Cardinal, Jennifer [60] see Cardinal, James

Louys, Julien [120] see O'Connor, Sue

**Lovata, Troy (University of New Mexico)**

[21]

*Archaeological and Interdisciplinary Perspectives on the Continental Divide National Scenic Trail in New Mexico, USA*

The Continental Divide National Scenic Trail (CDT) is the longest, newest, least hiked, and roughest of the United States' “Triple Crown”—along with the Appalachian Trail and the Pacific Crest Trail—of iconic, nationally sanctioned thru-hiking trails. The CDT runs some 3,000 miles/4,800 km up the spine of the Rocky Mountains from America's southern border with Mexico to its northern border with Canada. For more than six years, undergraduate students in the University of New Mexico's Interdisciplinary Honors College course The Archaeology of Trails have annually hiked and backpacked sections of the CDT in New Mexico where it overlaps the Zuni-Acoma Trail and through the San Pedro Parks Wilderness Area in order to study the material impact of contemporary recreational hikers in comparison to broader archaeological studies in the region as well as worldwide archaeological studies of mobility and trails. Their hikes—based on anthropological, archaeological, and cultural geographic methods focused on finding meaning through directed walking and centering culture in the act of traveling the landscape—examine why past and present peoples hike, how and why they mark their pedestrian experiences, and how people use thru-hiking to define themselves.

**Lovis, William (Michigan State University), Linda Cummings (PaleoResearch Inc.) and John Hart (New York State Museum)**

[119]

*Did You Ever Want to Get Multiple AMS Ages on One Ceramic Vessel? Well, We Did Just That!*

Increases in the use of adhered carbonized food residues (aka food crusts) from the interiors of ceramic cooking vessels to obtain direct AMS ages on individual vessels and the proxies of foods cooked in them raises a raft of questions designed to refine the use of the approach. Many desire to assess the consistency of the ages obtained from an individual vessel, if sampled at different locations on the vessel wall. Would the ages obtained be statistically the same or different, vary by sampling position, or alter interpretation? To affect this requires multiple AMS ages, an often cost prohibitive exercise. Here, we report on the variable outcomes of a collaboration that obtained up to a dozen sample ages from multiple individual vessels from several Upper Great Lakes Woodland sites, the results of which provide both insights and cautionary notes for future research.

Loyless, Alyssa [181] see Klassen, Sarah

Loyola, Rodrigo [192] see Glascock, Michael

**Lozada, Maria (University of Chicago)**

[217]

*The Chiribaya Tradition: A Multidisciplinary Approach to the Reconstruction of a Coastal Señorío*

Chiribaya defines a tradition that developed in Southern Peru during the Late Intermediate period, first identified by Augusto Belán in 1981. Initially thought to be derived from Tiwanaku colonies established in the Osmore drainage, today it is thought to be a complex society that developed independently from serrano influences, one that extended to the mid-valley and neighboring coastal river valleys. Furthermore, Chiribaya was structured around groups of specialists responsible for either maritime or agropastoralist activities that followed the *señorio* political economical system based on Maria Rostworowski horizontality model. This interpretation is based mostly on mortuary data and a large set of bioarchaeological research including body modification, dietary reconstruction, and biological distance studies. In this paper, I will offer the most up to date review of current thinking regarding the Chiribaya based on the work of both Peruvian and international scholars.

**Lozano, Stephanie (University of California, Riverside)**

[201]

*Understanding the Teotihuacan Tlaloc through Relational Ontology*

The Teotihuacan Tlaloc was represented in material objects, as seen in ceramic effigy jars, tripods, figurines, murals, monuments, and glyphic writing found in and outside of the Central Mexican Highlands. The Teotihuacan Tlaloc found in material objects contained a life-giving essence that reflects an Indigenous animated universe which is relational. In this paper I apply the theory of relational ontology to the study of the Teotihuacan Tlaloc. Relational ontology questions the use of Western Cartesian dichotomies and individualism in interpreting non-Western cultures. In addition, relational ontology places Indigenous worldview from ethnohistorical records and contemporary ethnographies as theory (Astor-Aguilera 2010; Astor-Aguilera and Graham Harvey 2018; Harrison-Buck 2020; Harrison-Buck and Freidel 2021). In the past scholars have studied the Teotihuacan Tlaloc through Western models by classifying the entity into types. However, I posit that the Teotihuacan Tlaloc was more fluid and cannot be bounded into strict categories but may have been bundled with other entities as expressed through the iconography. In addition, I suggest that the Teotihuacan Tlaloc was in a relationship with other objects, with the landscape (mountains), atmospheric phenomena (rain, thunder, and lightning), with humans, and with other Mesoamerican rain entities.

Luan, Fengshi [139] see Yin, Ruixue

**Lucas, Virginia (University of Nevada–Las Vegas/Lost City Museum)**

[38]

*A Zooarchaeological Approach to Subsistence Practices of the Lowland Virgin Branch Pueblos in the Moapa Valley from Basketmaker II to Pueblo III (300 BC–AD 1250)*

Subsistence practices of the Lowland Virgin Pueblos of the Moapa Valley, located in southern Nevada, are not yet well understood. While there is much more data available concerning lithic technologies, ceramics, and to some extent botanical remains, there is little information concerning the animal exploitation practices of the peoples in the Moapa Valley. This research investigated the subsistence patterns and faunal exploitation practices from Basketmaker II to Pueblo III (300 BC–AD 1250). During this time, food procurement strategies were shifting from hunting and gathering to maize cultivation, and utilizing extant collections from earlier excavations, this research aims to better understand how subsistence practices in the Moapa Valley changed with this shift to maize cultivation. Because of the scant data on these exploitation practices, this research provides a synthetic narrative of prehistoric hunting and foraging adaptations of the Lowland Virgin Puebloan peoples.

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

[49]

*Discussant*

Lucero, Lisa [22] see Gill, Rachel

**Luchsinger, Heidi (SWCA Environmental Consultants)**

[200]

*Late Holocene Reoccupation of Abandoned River Channels: Geoarchaeology of the Middle Rio Negro, Northern Patagonia, Argentina*

By the Late Holocene, occupation of the Middle Río Negro valley was extensive across an arid floodplain. Access to fresh water was limited to the main river and local bedrock is friable sandstone, useless for making most lithic tools. Such constraints led to settlement mainly along the main river channel and would indicate procurement of lithic raw material from long distances. However, the middle Río Negro abruptly shifted its course on three occasions, leaving three large abandoned channels cutting across the landscape. Geologic, geomorphic, stratigraphic, hydrologic, petrographic, and geoarchaeological data indicate that these abandoned channels were reoccupied temporarily for resource procurement. Resources (e.g., lithic raw material, fauna, variety of vegetation) were made available due to (1) channel avulsion, (2) incision of the water table within abandoned channels by narrow flood channels, and (3) exposed large gravel splays of high-quality volcanics on the channel bottom. Even though proximity to the main river channel would have been the primary location for more permanent settlement, contemporary procurement sites also exist along the margins of abandoned channels. The contemporaneous relationship of sites along both the main and abandoned channels can only be understood after careful analysis of processes that produced this unique landscape.

Ludvik, Geoffrey [23] see Larson, Kara

Luer, George [67] see Wallis, Neill

**Lujan Sanders, Mariana, Hannah Mattson and Kari Schleher**

[173]

*Occupational Use, Stability, and Intensity of Protohistoric Field Houses along the Sandia Mountains, New Mexico*

Through field schools conducted from 2017 to 2019, the University of New Mexico excavated multiple fourteenth- to sixteenth-century Ancestral Pueblo field houses along the eastern flank of the Sandia Mountains. The sites investigated sit between Tonque and Paako Pueblos, two of the largest communities within the broader Albuquerque area during their time of occupation. This poster presents the results of ceramic analysis focusing on the occupational history of these field structures in terms of duration, intensity, and stability. We use ceramic assemblages and data from other area field houses to examine possible changes in site function over time and explore the relationship of these smaller sites to larger contemporaneous pueblos. Through this investigation along with comparison of data from other area field houses, we hope to better understand how and why field houses were used in the Middle Rio Grande region of New Mexico in the centuries preceding Spanish colonization.

Luke, Christina [89] see Skaggs, Sheldon

Lunniss, Richard [38] see Cobb, Emilie

Lunniss, Richard [193] see Juengst, Sara

**Lurie, Rochelle (Macktown Living History) and M. Catherine Bird (Elgin Historical Society)****[182]***How Final Is Your Final Resting Place? Chicago Area Nineteenth- and Early Twentieth-Century Cemeteries*

Early Chicago metropolitan cemeteries were relegated to what was then the city's edge. Now much of these areas are prime real estate. Road and airport expansion projects, new housing developments, and shopping mall construction impinge on forgotten family cemeteries, "vacated" cemeteries, "inconveniently" situated cemeteries, and poor farm cemeteries. Archaeological surveys have identified undisturbed and previously disturbed graves which provide information about early farm life, religious institutions, and social structure. Two family cemeteries, two church cemeteries, two municipal cemeteries, and two poor farm cemeteries provide important examples.

**Luthra, Alisa (Florida Museum of Natural History, University of Florida) and Lazaro Vinola Lopez (Florida Museum of Natural History, University of Florida)****[114]***Population Variation among Extinct Species of Rodents Informs about Exploitation of Resources on the Island of Hispaniola*

How humans have impacted rodent biodiversity in the Greater Antilles is still being studied within pre-Columbian Caribbean archaeology. Rodents were an important component of diet and culture for the people of this region, and continue to be a crucial economic resource into the present day. The island of Hispaniola is the center of the speciation of rodents within the Caribbean; however, most species became extinct within the last 2,000 years. Studies on the only extant species of rodents from Hispaniola have shown the existence of morphometric and body size differences from distinct biogeographical regions within the island. Nonetheless, it remains unknown if extinct species follow a similar pattern or not. As a part of the 2021 iDigBio-Summer Internship Program, graduate and undergraduate researchers used cranial and mandibular morphometric data of six extinct Hispaniola rodent species, sourced from collections at the Florida Museum of Natural History, to test this hypothesis. We found significant differences among populations of the same species from distinct biogeographical regions in Hispaniola. These results allow us to create a baseline from the paleontological record and compare it with archaeological specimens, to determine whether humans were translocating species across the island or using local resources.

**Luu, Melina (University of Nevada–Las Vegas)****[38]***A Metadata Analysis of Archaeological Dental Calculus Studies, 2000–2020*

The collection of human dental calculus has recently emerged as a powerful method used in pathological or dietary studies in archaeological research. In the last 20 years, advances in extraction techniques of calculus have allowed for the collection of new types of microremains besides the microbotanical, such as microbiota. This poster presents an analysis of metadata collected from dental calculus articles published between 2000 and 2020 to identify trends in changes of research emphasis, such as types of microremains extracted and regions under study. Analysis of 13 variables shows, among several other patterns, heavy emphasis on specific regions such as Europe, an increase in the frequency of the number of articles using phytoliths and starch grains as opposed to other types of microremains, a lack of specification of sampling locations or type of teeth sampled, and an absence of named theories or other attempts to integrate results beyond historical context. Finally, the analysis of these metadata offers potential suggestions for researchers to incorporate in the publication of future studies.

**Luzzadder-Beach, Sheryl (University of Texas at Austin) and Timothy Beach (University of Texas at Austin)****[48]***Some Cases of Water and Soil Management in the Maya Lowlands through the 536 and 540 CE Events*

Drought evidence and the Ilopango Eruption, along with better dating, allow geoarchaeologists to test connections to environmental changes: erosion, soil formation, and water management. We draw on our own geoarchaeological and paleoecological investigations of the Maya Lowlands to follow the timeline of the 536 and 540 volcanic eruption events, and drought events, in the Maya Lowlands. We follow the evidence for environmental change and human connections using two case studies: Wetland field formation and use and dam and reservoir construction and use through these times. In this discussion, we consider the Birds of Paradise Wetland fields of northwestern Belize, and to the west, the El Zotz Dam and reservoir of the Peten, in the framework of the Late Preclassic / Early Classic Drought, middle sixth-century eruptions, and Terminal / Early Postclassic droughts. Our findings from lidar surveys and their field verification expand the known and potential number of such features, which allows us to explore local to wider geographical and temporal connections to global events and human interactions. This magnifies the need to field verify and date newly rediscovered soil and water management features as lidar investigations expand across the Maya Lowlands.

Luzzadder-Beach, Sheryl [179] see Rabinowitz, Adam

Lycett, Stephen [187] see Eren, Metin

Lycett, Stephen [20] see Gala, Nicholas

**Lyman, R. (University of Missouri, Columbia)****[16]***Innovative Graphs of Zooarchaeological Data: Prey Mortality, Skeletal Part Frequencies, Taphonomy, Butchering Practices, and Mary C. Stiner*

Well-designed graphs serve as effective and efficient communication devices and analytical tools because they stimulate visual thinking in the viewer. Beginning in the 1960s, North American zooarchaeologists frequently published graphs that summarized patterns and trends in zooarchaeological data. Zooarchaeologists have used bar graphs, line graphs, bivariate scatterplots, pie

charts, spindle graphs, three-pole graphs, and schematic skeletons to summarize their analytical results. Mary Stiner not only used many of these graph types to illustrate her monographs and articles, when necessary she designed innovative graph types, including (1) a three-pole graph of prey demography, (2) a set of multiple bar graphs comparing skeletal part profiles of known taphonomic history, (3) a taphonomic summary diagram, and (4) a graph of the differences in the angles of adjacent cut marks. Her innovative graphs include minimal superfluous ink and are readily deciphered with minimal requisite mental gymnastics. Nearly without precedent, Stiner has constructed her innovative graphs on solid actualistic foundations, thereby providing a basis for well-founded interpretations of the spatial relations of the plotted variables. We should all be so wise.

**Lynch, Joshua**

[213]

*How I Broke This: A Use-Wear Analysis of Dalton Assemblages from Bluff Shelters in the Boston Mountains, Arkansas*

Between 1968 and 1970, a large-scale archaeological survey was launched across public and private land in the Limestone valley, located in the central Boston Mountains of southwestern Newton County, Arkansas. In response to heavy looting and rapidly degrading site integrity, Thelma and Louis Gregoire surveyed miles of land along Big Piney, Steel, and Home Creeks, collecting cultural materials from sites in the plowed fields of the bottomlands and more than 100 bluff shelters in (and adjacent to) the Ozark-St. Francis National Forest. The bluff shelters of the Ozark Plateau are renowned landscape features that have yielded significant archaeological resources and shaped regional understandings of occupation histories and land-use patterns from the earliest Holocene through the historic period. Despite a robust record demonstrating the ceremonial and funerary importance of these distinctive landscapes in the later Holocene, early use of Ozark bluff shelters is less well understood. This paper presents a functional and use-wear analysis of five Dalton assemblages from four Ozark bluff shelters, and one open-air site, recovered during the Gregoire survey and the developing research efforts taking shape at Arkansas Tech University to comprehensively investigate this unique collection.

**Lyons, Natasha (Ursus Heritage Consulting), Tanja Hoffmann (University of Saskatchewan), Roma Leon (Katzie First Nation), Mike Leon (Katzie First Nation) and Michael Blake (University of British Columbia)**

[141]

*How Can Archaeobotany Be Put into Service of Katzie Food Sovereignty?*

How can archaeobotany be put into service of food sovereignty? Archaeobotany is a field of study that helps to establish the long and deep ties that First Nations communities in British Columbia have to their ancestral lands, which largely remain unresolved in a legal context, having never been ceded as historic land claims. To date, archaeobotanical evidence has not been used in evidentiary claims, yet it has significant potential to convincingly bridge the contact/precontact divide required by Western legal frameworks. For Katzie First Nation, a Coast Salish community of southwestern British Columbia, documenting the scope and continuity of ancient and historic resource management practices provides baseline data not only for rights and title claims but for food sovereignty initiatives that seek to envision and pursue land management practices in the present. In this paper, we present a landscape level analysis of archaeobotanical data that illustrates the ties between Katzie land use of the deep past and the asserted future. We describe how Katzie First Nation is using this data to challenge settler legal and policy jurisdictions in pursuit of regaining land tenures for the restoration of cultural keystone species.

**Lyons, Patrick (Arizona State Museum), Don Burgess (Arizona State Museum), Virginia Johns (Arizona State Museum) and Marilyn Marshall (Arizona State Museum)**

[215]

*The Architectural Stratigraphy and Dating of Point of Pines Pueblo: Basic Facts that Underlie Complex Inferences Regarding Interaction between Locals and Immigrants*

Point of Pines Pueblo, excavated between 1946 and 1958 by the Arizona State Museum and the University of Arizona (then) Department of Anthropology, has long been at the center of discussions about ancient migrations in the region and interaction between locals and immigrants. However, a lack of systematic analysis of the collections from the site and publication of data about it have left generations of researchers in the position of having to make assumptions about social processes unfolding in the Point of Pines region based on Emil W. Haury's (1958) six-page summary of his complex inferences. In this paper, we present the results of new analyses that establish the basic facts that allow a more accurate reconstruction of social dynamics at Point of Pines. We focus on stratigraphy, ceramics, dendrochronological data, and bond-abut information and we draw conclusions different from those arrived at by Haury and other researchers.

Lyste, Kerry [83] see Ferris, Jennifer

**Lytle, Whitney (Railway Village Museum)**

[170]

*COVID Recovery through Collaboration: A Small Museum's Strategy for Community Rebound*

The mission of the Railway Village Museum (RVM) is to educate visitors on nineteenth to mid-twentieth-century Maine life through their extensive collection of artifacts, historic structures, and working narrow-gauge railway. The year 2020 marked Maine's bicentennial and, as museums annually contribute \$195 million toward Maine's economy, it was anticipated as a banner year for tourism with multitudes of community and museum events. The cancellation of bicentennial celebrations was salt in the wound of pandemic-related closures. Like most museums, the loss of revenue during 2020 meant financial uncertainty. When the decision was made to reopen in 2021 RVM wanted to open with a (socially distant) bang while finding a way to support other local institutions who continued to struggle. A collaborative 200(+1) exhibit and virtual opportunities through a new smartphone app helped usher in

one of the most successful seasons of the museum's 65-year history. This presentation will discuss data on the effect of museum pandemic closures and how coming together after a year of being apart helped a community rebound.

**Maag, Kathryn**

[161]

*Cemetery Spatial Analysis at Carbon, Wyoming*

Carbon, Wyoming, occupied between 1868 and 1902, was the first established coal mining town on the Union Pacific Railroad. Within the context of industrial expansion in the Western United States, the community at Carbon was intimately connected to larger nineteenth-century labor and migration processes. Today, all that remains are the ruins of a few of the larger buildings in town and the cemetery, which is still in use and serves as a locus point tying the community of the past to its descendants of the present. Through the creation of a GIS digital map and analysis of cemetery records patterns of familial ties, local tragedies, and the construction and growth of the cemetery over time are clarified, allowing a deeper understanding of the community as it was. The results of this project highlight the value of cemetery archaeology and the creation and use of digital maps in contextualizing historical sites today and in the larger setting of the historical archaeology of the American West.

**MacDonald, Brandi (Archaeometry Lab at MURR), Farid Rahemtulla (University of Northern British Columbia), Kwun Whess (Lake Babine Nation) and David Stalla (University of Missouri)**

[155]

*Rock Art and Ochre Pigment Materiality at Babine Lake, British Columbia, Canada*

Pictographs, and the landscape formations they are featured on, are culturally significant places among Indigenous communities. Here, we present the preliminary results of a field survey and microanalysis of pictographs and the mineral pigments used to produce them at Babine Lake (British Columbia), in the traditional territory claimed by the Lake Babine Nation, the Tl'azt'en Nation, and the Yekooche Nation. The monochrome motifs are produced with iron oxide mineral pigments (red ochre), and are all painted on prominent, open-air rock faces overlooking deep water. Through the scientific analysis of the paints we have gained insights into aspects of pigment materiality, such as artistic selection of minerals with different physicochemical properties and the *chaîne opératoire* of paint preparation. Our results show that rock art painters at Babine Lake selected a diversity of iron oxide types to produce different pigment mixtures with distinctive properties, including the harvesting and thermal enhancement of iron-oxide-producing bacteria.

MacDonald, Brandi [167] see Navas-Méndez, Ana

MacDonald, Brandi [221] see Reinhardt, Eduard

MacDonald, Brandi [220] see Ronsairo, Karleen

MacDonald, Dana [24] see Gerard-Little, Peregrine

**Macdonald, Danielle (University of Tulsa) and Laher Lisa (University of California, Berkeley)**

[117]

*Epipaleolithic "Cultures": Using Variability to Explore Hunter-Gatherer Communities in the Past*

In archaeological practice, cultures are usually defined by representative material "types," whether it is a hand axe, a Levallois point, or a geometric microlith. However, the range of allowable variability within these types is often debated; how much variation is allowed before a new type must be defined? These debates factor strongly into Levantine Epipaleolithic research, where the morphological variability of microlithic tools has been interpreted to represent distinct cultural or ethnic communities. This poster addresses lithic variability during the Middle Epipaleolithic through the analysis of several Jordanian lithic assemblages. Although regionally disparate, the lithic assemblages from these hunter-gatherer sites are characterized by the same geometric microlith type: the trapeze-rectangle. The integration of typological, technological, and geometric morphometric analyses allows for the subtleties in material culture to be explored among these sites, exploring whether the variability we see in material culture is reflective of communities in the past.

Macdonald, Danielle [183] see Martisius, Naomi

**MacDonald, Douglas (University of Montana)**

[83]

*Discussant*

[83]

*Chair*

**MacFarland, Kathryn (Arizona State Museum, University of Arizona)**

[225]

*Fantastic Beasts of Animal Style Art: Statistically Analyzing Graphical Representations of Composite Figures of North Central Eurasia in the First Millennium BCE*

Stylistic protocols repeatedly incorporated into symbolic imagery and depicted on artifacts are a material window to widespread cultural and religious practices. Animal Style Art (ASA) is a geographically widespread phenomenon in north central Eurasia during the first millennium BCE. Scholars recognize this iconographic style based on general traits (e.g., decorative animal depictions, figural interactions), and macroscale statistical analyses have shown that there is overall statistical similarity in the expression of

ASA, indicative of wide-ranging religious networks. It is time to further analyze famous hallmarks of this distinctive style, composite figures (e.g., griffins), comparing figural compositions and other decorative attributes (figural combinations, contexts, and interactions) throughout north central Eurasia. Various figural combinations appear on artifacts, architectural features, tattoos, and masks transforming horses into composite figures. The goal is to determine degrees of similarity in figural depictions in pairwise regional comparisons (via similarity metrics) and further model rules dictating symbolic expression, adding information regarding protocols in which composite figures appear on material culture from elite mortuary contexts. These results inform comparative research on external examples of composite figures, frequently cited as inspirations for north central Eurasian figural combinations, better contextualizing wide-ranging complex networks of social interaction, continental trade, and political alliances.

Macias, Emmanuel [159] see Gonzales, Mikayla

**Macias Quintero, Juan Ignacio (UNICACH)**

[14]

*Across the Deserts: The Role of Nomadic Hunter-Gatherers in the Connections between Mesoamerica and Northern Mexico*

A proposal for the study of the involvement of the nomadic societies of the northern Mexico deserts is here developed. The archaeological common view stands that the long-distance contacts were made only between sedentary and Mesoamerican groups, without considering the routes, places of contact or the participation of other societies who inhabited the inner northern deserts. Here I address the relevance of the Sierras Transversales system as a potential exchange rout and as place for connections where groups with different levels of economic and social integration converged. Ecological conditions in this sierra systems, could be facilitated the movement of people and goods. I present some archaeological cases that indicate relations between hunter-gatherers and Mesoamerican cultures.

**MacIver, Andrew (University of California, Los Angeles)**

[82]

*In Conquest's Wake: Displacement, Negotiation, and Continuity during the Shang-Zhou Transition*

Following its conquest of the Late Shang polity (ca. 1300–1046 BC), an expanding Western Zhou polity (ca. 1046–771 BC) implemented strategies that systematically dismantled the Shang political landscape. Through the movement of the Shang people, the co-option of Shang artisans, the abandonment of the Shang capital of Yinxi, and the establishment of Zhou centers along the affective routes that once upheld Shang hegemony, the Zhou effectively uprooted the foundations of the Shang. The dislocation of the Shang people had three primary facets: the forced displacement of Shang lineages, the movement of people within realigning trade routes, and the relocation of Shang elites who allied with the Zhou. This paper explores this dislocation, its material evidence, and the impact this mass movement of people had on local social dynamics. Traditionally, the integration of the Shang remnants into the Zhou sociopolitical structure is viewed as a unilateral process of subordination. However, an analysis of local craft industries and Western Zhou urban contexts reveal intense dynamics of negotiation, tolerance, and resistance between local communities and the recently displaced Shang people. Moreover, Shang traditions, practices, and social memory would prove to be a potent source of knowledge and power within Zhou networks.

**MacIver, Andrew (University of California, Los Angeles)**

[107]

*Chair*

MacIver, Andrew [107] see Wang, Zichan

**Mack, Jennifer (University of Iowa, Office of the State Archaeologist)**

[17]

*Broken Blossoms: An Examination of Adolescent Mortality and Mortuary Treatment at Dubuque's Third Street Cemetery*

From 1833 to 1880, members of St. Raphael's Cathedral, a parish in Dubuque, Iowa, interred their dead in the Third Street Cemetery. In the twentieth century, the unmarked burial ground was disturbed by construction several times before 935 of the remaining burials were removed by the Iowa Office of the State Archaeologist between 2007 and 2011. Forty-three of the excavated graves were adolescent interments, several of which exhibited atypical burial attributes including decorative clothing hardware and nonreligious grave goods. This research project examined both mortality patterns and mortuary treatment at the Third Street Cemetery and highlighted differences between adolescents and other age groups buried in the grounds. Skeletal evidence of disease and trauma, in conjunction with historic death records, was used to explore health and mortality among Dubuque's nineteenth-century residents, particularly the high rate of accidental death among adolescent boys. Remnants of coffin hardware, burial clothing, and grave goods shed light on the population's changing views of the afterlife, as well as the identities of adolescents, as expressed by their principal mourners. Results of these analyses were compared with data collected from 10 additional nineteenth-century cemeteries to identify both similar and divergent patterns. (Slideshow includes images of human remains.)

Mack, Jennifer [52] see Noldner, Lara

**Mack, Joanne (University of Notre Dame), John Fagan (Archaeological Investigations Northwest), Mark Swisher (Oregon State Museum of Anthropology) and Cam Walker (Archaeological Investigations Northwest)****[198]***A Pilot Study to Determine Protein Residue on Low-Fired Ceramic Sherds*

Using Crossover Immuno-electrophoresis (CIEP) to determine protein residue on a sample of 10 Siskiyou Utility Ware sherds, Salmonidae (*Oncorhynchus*) protein residue was found on three of the 10 sherds. All 10 sherds had been recovered from professionally excavated archaeological sites located along the Upper Klamath and Middle Umpqua Rivers in Southwestern Oregon. Siskiyou Utility Ware dates to within the last 2,000 years within Southwestern Oregon and north central California. Additional sherds from north central California and Southwestern Oregon will be analyzed within the next year.

**Mackie, Madeline (Weber State University), Todd Surovell (University of Wyoming), Robert Kelly (University of Wyoming), Spencer Pelton (Office of the Wyoming State Archaeologist) and Matthew O'Brien (California State University Chico)****[97]***Investigating an Associated Camp at the La Prele Mammoth Site*

While Clovis has long been associated with mammoth hunting, particularly in the Plains and Southwest, there has rarely been the opportunity to deeply investigate the logistical challenges of processing a multi-ton mammal because associated camps have rarely been identified at Clovis proboscidean sites. The La Prele Mammoth site, located in Converse County, Wyoming, includes both the remains of a Columbian Mammoth (*Mammuthus columbi*) and the camp that was occupied during this mammoth's butchery. Since returning to the site in 2014 we have excavated ~150 m<sup>2</sup> including at least three hearth-centered activity areas adjacent to the mammoth remains. The La Prele assemblage includes items that are both expected and unexpected for a proboscidean butchery site including at least one projectile point fragment, preforms, channel flakes, non-mammoth faunal remains, ivory, bone needles, and a large ochre stain. Beyond answering logistical questions about multi-ton mammal processing, the presence of multiple hearth centered activity areas, which possibly represent interior spaces, means La Prele has the potential to inform Clovis social dynamics during large game butchery nearly 13,000 years ago.

Mackie, Madeline [116] see Doering, Briana

Mackie, Madeline [97] see Kilby, David

Mackie, Madeline [116] see Koenig, Charles

Mackie, Madeline [136] see Rockwell, Heather

**MacLellan, Jessica (Smithsonian Tropical Research Institute; University of Arizona)****[49]***Finding Counterpublics and Communities in Maya Archaeology*

In this introductory paper, I outline the theoretical perspectives at the core of this symposium and consider their potential uses in archaeology, focusing on studies of the ancient Maya. In a 2015 article, Inomata, Burham, and I used Habermas's theory of the public sphere to understand the role of public (vs. domestic) spaces and rituals in very early Maya society. Taking up critiques and revisions of Habermas's original theory, the participants in this session challenge the dichotomy of public vs. domestic to consider the roles of multiple publics, counterpublics, or overlapping communities within past societies throughout the Americas. As is true in our modern society, smaller groups had the power to resist and transform larger social structures. I discuss the influence of these ideas on my own research into Preclassic Maya ritual and suggest other possible areas of application in Maya archaeology. I argue that by investigating spaces and practices that were neither public nor private, we can gain a more complete and nuanced understanding of social organization and social change in Mesoamerica and beyond.

**MacLellan, Jessica (Smithsonian Tropical Research Institute; University of Arizona)****[49]***Chair*

Macphail, Richard [50] see Graham, Elizabeth

**Macrae, Scott (Trent University), Gyles Iannone (Trent University), Kong Cheong (American University) and Pyiet Phyo Kyaw (University of Mandalay)****[181]***Implications of the Climatic and Environmental Conditions during the Early Occupation at Bagan, Myanmar*

The ancient capital of Bagan (eleventh to fourteenth century CE) sits prominently along the Ayeyarwady River in Myanmar. Being both an authoritative capital as well as a cosmological and ritual epicenter of Theravada Buddhism for the Classical Burmese Empire, this archaeological site has an important place in Myanmar's society both past and present. For decades, the earliest occupation periods of this ancient landscape have been elusive, dictated by references in the quasi-mythological retrospective chronicles, restricted stone inscription, and limited archaeological data. However, a few small-scale excavations within Bagan's peri-urban settlement zone, and within the walled and moated "royal city," have demonstrated that considerable knowledge about the city's past can be gained through rigorous archaeological investigations. Reviewing these lines of evidence and contrasting it with the climatic and environmental circumstances will test past assumptions and contribute to the understanding of the Pre-Bagan (600–1044 CE) period. This will create a framework for the emerging archaeological record and question why people choose to live in this harsh environment and ultimately lay the foundations for what would become one of Southeast Asia's great cities.

**Macrae, Scott (Trent University)****[181]***Chair*

Macrae, Scott [82] see Cheong, Kong

Macrae, Scott [218] see Iannone, Gyles

**MacWilliams, Arthur****[118]***Reconocimiento Regional de Paquimé and the Growth of Casas Grandes Archaeology*

Two of several projects that occurred in Chihuahua through the 1990s–early 2000s were Paul and Mike's Casas Grandes Reconocimiento Regional de Paquimé (RRP) and the Proyecto Arqueología Chihuahua (PAC) directed by Jane Kelley and Joe Stewart. It was my good fortune to participate in both projects. I was invited to speak about Mike and Paul's influence as a mentor on my PAC work. In short, they are masterful mentors for myriad reasons. This mentoring is best understood as one element of a greater phenomenon, which is how Casas Grandes archaeology flourished through their actions. Research needs of the time included uncovering Casas Grandes area settlement distribution, improving the then-controversial Casas Grandes chronology, and generating excavation data outside of Paquimé. Mike and Paul systematically addressed each need and readily disseminated key findings and interpretations. These advances were incorporated into knowledge bases and actions of other projects, PAC included. This knowledge sharing occurred through many avenues including crew members. Mentoring student crews had heightened importance as almost nobody was familiar with Casas Grandes at the outset of these projects. Paul and Mike thoroughly overcame this challenge, leaving crew members much better prepared for Casas Grandes and archaeology more generally.

**Mader, Christian (University of Bonn)****[157]***Escaped from the Isoscape: Strontium Isotope Analysis as a Tool to Study Resource Dependencies*

"Resource dependency" is a new concept in social theory, providing an analytical framework to study broader cultural contexts of activities such as migration, mobility, coerced relocation, pilgrimage, transhumance, trade, labor, colonialism, and imperialism. Resource dependencies are defined essentially by two significant forms of structural dependency within their particular ecological and sociopolitical setting: the first concerning human dependencies on resources of every kind and the accessibility and control of those resources, which is crucial to the second, dependencies between people reflected, for instance, in cooperation and exploitation. These two forms of dependency profoundly affect each other, since the way humans interact will, in turn, also shape their dependency on resources. The methodological key to examine resource dependencies is a holistic and interdisciplinary approach integrating three lines of archaeological evidence: (1) landscapes, architecture, and households; (2) artifacts and biofacts; and (3) human and animal remains. This paper explores the possibility of strontium isotope analysis ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) as a tool to synthesize diverse lines of archaeological evidence against a theoretically engaged backdrop, tacking as an example  $^{87}\text{Sr}/^{86}\text{Sr}$  data relevant to the three mentioned lines of evidence. In so doing, the case study here focuses on the precolumbian period in the northern Nasca Drainage, southern Peru.

**Madsen, Christian (Greenland National Museum/National Museum of Denmark), Michael Nielsen (University of Greenland), Aka Simonsen Bendtsen (University of Greenland), Birte Olsen (University of Greenland) and Thomas McGovern (CUNY, Hunter College)****[33]***Traumatic Transformation? Early Inuit in South Greenland*

South Greenland (Kujataa) was inhabited by Early (Thule) Inuit during the fifteenth century AD who established thriving communities ancestral to the present Kalaallit population in the region. However, Kujataa has seen limited archaeological research and little is known of local Inuit sea and land use, population size, organization, and social-ecological change before the Danish-Norwegian colonization of the region in the 1770s. As part of an effort to assess and combat the loss of heritage due to climate change, to build local archaeological capacity and support Kujataa's UNESCO World Heritage site, ILAA/REI are two linked projects that investigate Early Inuit historical ecology across three fjords in Kujataa. While the study is ongoing and the results preliminary, our initial archaeological findings suggest social-ecological change and reorganization throughout the Early Inuit settlement period. However, the speed and extent of the changes are most noticeable in the colonization period, taking on the scale of society-wide dramatic—perhaps even traumatic—transformation, evidently driven mainly by intensifying regional colonial and mission activities.

**Madsen, Christian (Greenland National Museum/The National Museum of Denmark)****[33]***Chair*

Madsen, Christian [33] see McGovern, Thomas

Madsen, Christian [33] see Simonsen Bendtsen, Aka

Maezumi, S. Yoshi [120] see Siegel, Peter

**Magargal, Kate (University of Utah) and Brian Coddig (University of Utah)****[160]***Firewood as a Primary Constraint on Settlement Location*

Surface-harvested biofuels, of which firewood is a major constituent, comprised the primary fuel source for all humans until recently. Even today, roughly one-third of the global population depends on surface fuels harvested daily from woodlands and forests. Firewood is distributed heterogeneously, can be costly to harvest, and varies considerably in quality. These characteristics make firewood a likely candidate for a strong constraint on the location of human settlements and inform the ecological and social consequences of living in those locations. The extent to which this is so should vary based on (1) the amount of demand for firewood, (2) the pace of regrowth, and (3) the density of available wood for harvest. Using a series of archaeological case studies, we examine how variation across these three dimensions influenced why and where people were located. The characteristics of local firewood resources and the human groups who relied on them influenced settlement locations, land use patterns, and human impacts on the environment.

**Magnani, Matthew (UiT the Arctic University of Norway) and Natalia Magnani (UiT the Arctic University of Norway)****[148]***Peer Review Culture*

Publication is key to securing academic jobs, advancement to tenure and successful dissemination of research. Standing between scholars and publication is the peer review process. At its best, peer review provides a rigorous evaluation of manuscripts, improving research quality and its connections to anthropological currents. At its worst, the process not only diminishes innovation, but also the well-being of scholars; excoriating anonymous comments on manuscripts are commonplace, leading not only to manuscript rejection, but also self-doubt. Who is impacted by these negative experiences most acutely, and in what ways are they affected? For a field concerned with past and continuing inequalities, it is critical to evaluate the impacts of an opaque system tied to professional advancement. Drawing on survey data and the personal experience of the authors, this paper pursues a discussion of peer review in anthropology and archaeology. From our results, we argue for the development of community standards for constructive criticism to be implemented at an editorial level and promoted by scholars more widely.

Magnani, Natalia [148] see Magnani, Matthew

**Mahan, Chase (University of Wyoming), Sarah Allaun (University of Wyoming) and Todd Surovell (University of Wyoming)****[117]***Redating the Sheaman Clovis Site, Wyoming*

The Sheaman site, located in eastern Wyoming near the Agate Basin site, has been represented as one of only a few Clovis campsites in North America. However, problematic dating of the site has resulted in a questionable Clovis affiliation. A total of 16 radiocarbon dates have been used by various researchers to argue for or against that affiliation, with some research suggesting a younger Paleoindian Goshen or Agate Basin affiliation. This report presents new radiocarbon dates from the site, reviews radiocarbon dating techniques, and fails to support the original argument of the Sheaman site as a Clovis component.

**Maher, Lisa (University of California Berkeley)****[214]***Lessons from Southwest Asia: Prehistoric Hunter-Gatherer Landscapes, Sustainability, and Transitions to Food Production*

Since the end of the Pleistocene and, especially, with the development of agriculturally based societies humans have had cumulative and often irreversible impacts on natural landscapes and biotic resources worldwide. Through the increasing archaeological evidence for these long-term changes, it is apparent that our current climate change and biodiversity crises are not exclusively developments of the industrial and postindustrial world. Through the lens of the prehistoric record of hunter-gatherers and early agriculturists of Southwest Asia, here I explore how these groups created and transformed their landscapes, in interrelated physical and social ways. Case studies from Jordan and Cyprus illuminate the value of frameworks of transported landscapes and landscape learning in considering how these hunter-gatherers and early farmers engaged with the world around them. The lessons drawn from these archaeological examples can provide insights relevant to paleoenvironmental reconstructions writ large and allow us to draw connections between distant places and times to unravel the broad trends of human ecodynamics over the past 20,000, or more, years.

Maher, Lisa [183] see Martisius, Naomi

Maio, Daniela [98] see Gonçalves, Célia

**Majewski, Teresita (Statistical Research Inc.)****[81]***American Recovery and Reinvestment Act Nationwide Section 110 Work*

Work funded by the American Recovery and Reinvestment Act of 2009 through the US Army Corps of Engineers, St. Louis District consisted of 40 individual delivery orders for "shovel-ready" projects within 18 months. The work provided the government's three prime contractors with opportunities to gain new experience and build relationships with every Corps District in the continental United States, and projects were conducted in more than 30 of the lower 48 states. In addition to nearly 60,000 acres of archaeological survey, contractors and their small business team members completed site evaluations, geoarchaeological and condition assessments, National Register nominations, GIS analysis and modeling, curation, and other tasks, such as supporting the Veterans Curation Project. Accelerated timelines for projects spurred development of innovative fieldwork and management

strategies to meet the government's requirements for high-quality archaeological work and contractual accountability. The projects also made valuable contributions to our understanding of our collective heritage, particularly in some Corps Districts where knowledge of regional prehistory and history was incomplete. This work was a lifeline for many cultural resource management companies during the Great Recession, and is a testimony to the creative thinking of Dr. Michael K. "Sonny" Trimble and his staff.

Maki, David [131] see Tveskov, Mark

**Makowski, Krzysztof**

[192]

*Pachacamac and the Andean Empires*

The results of the investigations carried out since 2005 by members of the Archaeological Program "Pachacamac Valley, PUCP-UNACEM Agreement," made clear that the current appearance of monumental Pachacamac, with a planned layout that has three walls, as well as two long straight streets that run through the central part of the sanctuary, from south to north and from east to west, is due, exclusively, to the activity of the Inca administration. The results of our last 11 excavation campaigns conducted at Pachacamac indicate that there have been no continuities, either in the architectural design or in the layout, throughout the five successive periods of human occupation that occurred at the site: the Middle Lima, the Late Lima (Maranga), the Initial Ychsma-Wari, the Middle Ychsma, and that of the Inca. Furthermore, each of the periods is characterized by different types of architecture and a particular distribution of the built space, compared to the others. In this presentation we will emphasize the evidence that brings new lights to the problem of the Wari presence in Pachacamac.

**Maldonado, Amanda (Versar Inc.) and Laura Short (Versar Inc.)**

[24]

*Archaic Presence at Avon Park Air Force Range*

Avon Park Air Force Range (APAFR), located in the central Florida Kissimmee River Basin, is home to approximately 260 known archaeological sites. A total of 112 of those sites are prehistoric with approximately 50% having an Archaic period occupation. Recent investigations at APAFR have resulted in the survey of 5,114.34 acres with the documentation of 22 and evaluation of 16 archaeological sites. The majority of the sites fall within the Archaic time period and reflect Archaic lithic scatters, representing the mid-Holocene pattern of reduced mobility and changing resource procurement patterns. Four are larger sites that appear to have multiple occupational episodes. In addition to the larger occupation sites, a number of smaller hunting camps have also been identified along the edges of resource rich landscapes. The abundance of Archaic period sites on APAFR indicate that the resources available in the area attracted groups on a reoccurring seasonal basis and supports established settlement patterns of the region throughout the Middle to Late Archaic periods.

**Malin-Boyce, Susan and Jo Balicki**

[81]

*The Rediscovery and Restoration of Arlington Cemetery's Ord-Wietzel and Sheridan Gates, Arlington, Virginia*

Two stone gates along the east side of Arlington National Cemetery were removed to an unused part of the cemetery in the early 1970s as part of ongoing modifications to the grounds. Known as the Ord-Weitzel and Sheridan gates, they were no longer wide enough to accommodate vehicular traffic, and so, nearly 100 years after they were erected, they were pulled down. Forty years later, they were to be reincorporated into the expanding cemetery and the person who became increasingly involved in the assessment and restoration of these important architectural elements was Sonny Trimble. Trimble and the Corps of Engineers' Mandatory Center of Expertise spent 11 years working to repair and preserve the gates, which will soon be reinstalled. This paper discusses the technically specialized and lengthy restoration process required to fulfill Sonny's vision of incorporating these historic elements into the landscape of the modern cemetery.

Malin-Boyce, Susan [81] see Smith, Mark

**Mallios, Seth**

[45]

*An Architecture of Resilience, Community, and Historical Minstrelsy at the Nathan Harrison Cabin Site*

While the primary structure at the late nineteenth-century Nathan Harrison site on Palomar Mountain in San Diego County seemingly resembles a slave quarters from the Antebellum South, it serves as a springboard for complex anthropological discussions of identity, survival strategies, and myth-making. Harrison was an African American from Kentucky who endured the horrors of slavery, the mania of the Gold Rush, and the chaos of southern California's Old West to become a San Diego legend. The deceptively simple cabin he constructed at his hillside homestead was a key component of his minstrelsy, a public performance that allowed him to mask important contemporary societal gains (freedom, water and land ownership, exalted pioneer status, etc.) under the auspices of rusticism, simplicity, and self-deprecation. Drawing on Kent Lightfoot's career-long dedication to multiple lines of evidence, paradigmatic pluralism, and diachronic responses to colonialism and hegemonic strife, this paper examines how the cabin was a blend of all things Nathan Harrison, reflecting numerous choices regarding universal human needs, modest economic means, individualized tastes, and the results of his unique and particular history. Harrison carried cultural traditions with him yet reinvented them with every decision he made, experience he lived, and role he played.

**Mallios, Seth**

[45]

*Chair*

Mandel, Rolfe [64] see Holcomb, Justin  
 Mandel, Rolfe [202] see Niquette, Richard

Manfio, Stefania [107] see Cianciosi, Alessandra

**Manne, Tiina (University of Queensland)**

[16]

*Catching the Hare Down Under: Bilbies, Bandicoots, and Bats*

While northern Sahul was settled by humans 65,000 years ago, there are considerable challenges for understanding Pleistocene and Holocene diet economies in this region. These include a high taxonomic diversity, the slow accumulation of the archaeological record, challenging conditions for the preservation of bone, along with a lack of clear protocols for the identification of taphonomic signatures of marsupial carnivores, and the taxonomic identification of postcranial remains. Mary Stiner's influence is leading to new insights into patterns of faunal exploitation in northern Sahul. In this paper I provide an overview of this work, including new insights into understanding risk and prey rank.

**Manne, Tiina (University of Queensland)**

[16]

*Chair*

**Manney, Shelby (Joint Force Command—US National Guard) and Michael Heilen (Statistical Research Inc.)**

[197]

*Restoring Living Landscapes through Integration of Cultural and Natural Resource Management*

Cultural resource management in the United States is focused primarily on the identification and management of archaeological sites and historic buildings, structures, and districts. This approach is at odds with Native American perspectives which do not separate nature from culture. Native American Tribes routinely identify natural resources—including plants, animals, habitats, water and mineral sources, and landforms—as part of their living culture and want these resources to be more fully considered alongside cultural resources in project planning and the mitigation of adverse effects. Federal agencies have also identified integration of cultural and natural resource management as important to achieving better conservation and preservation outcomes, through greater responsiveness to stakeholder concerns and early identification and consideration of management synergies and conflicts. A national framework for integrating environmental compliance and cultural resource management is needed to manage living landscapes effectively. The Arizona Army National Guard (AANG) consults with 33 Native American Tribes in managing cultural and natural resources throughout Arizona. This presentation discusses the AANG's ongoing efforts to develop an integrated resource management program that better addresses agency requirements and stakeholder concerns and can contribute to a national framework for environmental compliance.

Manney, Shelby [56] see Gregory, Teresa

Manney, Shelby [66] see Heilen, Michael

Manney, Shelby [78] see Polanyi, Tamas

**Mantha, Alexis (Champlain College, Saint-Lambert)**

[84]

*At the Confluence of Sociopolitical Interests Stood the Ancestor: The Dynamics of Political Authority in the Rapayán-Tantamayo Area during the LIP*

The LIP (1000–1450 CE) settlements of the Rapayán-Tantamayo region are located along the hills overlooking the upper Marañón River in the Central Andes. At this location, the flow of the Marañón shifts 25 km eastward and runs very close to the selva alta over a length of 30 km before returning to its original course westward. The Rapayán-Tantamayo region, thereby, represented one of the main gateways into the selva in prehispanic Ancash and Huánuco. In addition, the Rapayán-Tantamayo area accommodated two distinct but complementary economies. The steeper hillsides around the village of Rapayán favored agriculture in the north, whereas the high plateaus of the puna, predominant around Tantamayo, made herding more suitable in the south. The strategic location of the region as a gateway to the selva and its resources as well as the convergence of complementary economies, among others, resulted in the development of peculiar cultural forms. For instance, the collectivities of the region built much more ostentatious mortuary monuments than are commonly observed elsewhere in the highlands during the LIP. In this presentation, I discuss the LIP architectural variability resulting from the convergence of socioeconomic interests to account for the distinctive sociopolitical trajectory of the Rapayán-Tantamayo area.

**Mantia, Tyler (Illinois State University)**

[143]

*Ani-Kitu Hwagi (Cherokee) Center Places: A Study of Survivance*

Ani-Kitu Hwagi (Cherokee) settlements across the southeastern United States have been intensively studied to evaluate how social dynamics, gender roles, and economic disruption came to impact levels of stability and variability within both domestic and public structures or spaces during the seventeenth to eighteenth century. Some studies characterize this period by using the term Shatter Zone to describe a historical model which emphasizes a landscape of disruption which commonly brings forth population displacement, wide-spread disease, increased levels of slavery, and economic disruption. Scholars have utilized the Shatter Zone model to explain the changes occurring during the English Contact period (1670–1740) in Ani-Kitu Hwagi households and public spheres. I evaluate the Shatter Zone model by reorienting analyses in terms of center places, a conceptual framework of attachment

between Ani-Kitu Hwagi individuals, their communities and ancestral past, and survivance, a critical theory of cultural resilience. This study compares changes in architectural artifact assemblage data, settlement pattern, and architectural orientation from archaeological sites located throughout the Ani-Kitu Hwagi Lower Towns, Middle, Valley, Out Towns, and Overhill settlements. The trends of structure and hearth size and shape demonstrate forms of vivid survivance as an active process of Indigenous avoidance of subjugation and victimry.

**Mara, Anisa (University of Toronto)**

[147]

*Communal Interaction in Northern Albania during the Fourth and Third Millennium BC*

This paper explores community interactions in Bronze Age northern Albania, focusing on two contrasting landscapes: the western coastal areas and eastern hinterlands. In the Early Bronze Age, northern Albania saw a substantial shift in settlement patterns, mortuary practices, and craft production; these changes have generally been explained at a supra-regional scale, in terms of Indo-European migrations or cultural contact with groups arriving from the northern Adriatic. These interpretations, however, have mainly been based on archaeological data from southeastern Albania and the diffusion of pottery styles across the Balkans. As a result, social dynamics in northern Albania remain underexplored. One project bucking this trend is the Projekti Arkeologjik i Shkodrës, notably where questions of social hierarchy and mobility are concerned. One pattern appears: the relatively high degree of similarity in burial customs, alongside diversity in pottery production. Here, morphological analysis of pottery from previously excavated sites in northern Albania is presented, comparing and contrasting coastal areas with those of the hinterlands. The study identifies interregional variation and long-term change in pottery manufacturing processes from the Early to Middle Bronze Age. The results show that while some connectivity between the coast and hinterland may exist, these regions represent different communication zones.

**Mara, Anisa (University of Toronto)**

[147]

Chair

**Marciniak, Arkadiusz (Institute of Prehistory, University of Poznan)**

[61]

*The Human-Mediated Evolution of Cattle in the Neolithic of the Polish Lowlands*

Cattle (*Bos taurus*) descended from the aurochs (*Bos primigenius*) and rose to the most important domesticated animal in the Neolithic of the Polish lowlands. Early Neolithic European farmers have brought domesticated cattle to an enormous variety of environments. A possibility to expand the inhabitable zone by humans required the ability to protect and control the breeding of animals in conditions that were tolerated by their wild ancestors. The paper aims at discussing two major human-mediated interventions: regulating the fertility cycle and selective killing in the context of environmental and climatic conditions constraining these deliberately executed interventions. The paper will then examine major consequences of these developments on cattle-based agriculture in the region, including changes in cattle morphotypes, modification in their genetic structure, as well as the impact on subsistence economy, including milk availability and cheese-making.

**Marciniak, Arkadiusz (Institute of Prehistory, University of Poznan)**

[61]

Chair

**Marcone, Giancarlo (University of Engineering and Technology [Utec])**

[9]

*Of Lomas and Foothills: Reconstructing Long-Term Intervalley Occupations on the Peruvian Central Coast from Satellite Photography*

This paper asks about the long-term relation between humans and landscape, analyzing the occupation of intervalleys on the Peruvian central coast. The areas between the valleys were occupied either by permanent settlements based in the exploitation of Lomas ecosystems or a seasonal pastoralist occupation characterized by scattered corrals used by Highland people. It was widely proposed that the Lomas were a key component in the subsistence and relation between highland and coastal people. Also, both climatic change and overexploitation since colonial times cause the diminishment of these ecological patches. But until now we lack of a general picture that help support or reject these affirmations. A satellite survey supports a sequence of the long-term occupation in the intervalley regions. This ranges from the permanent occupation of the Loma ecosystem that coexisted with the seasonal presence of pastors in prehispanic times to evidence of a post conquest moment where occupation was centered in highland seasonal pastoralism occupation. The seasonal pastoralism practice became predominant with the decline of the fragile Lomas ecosystem. This study is likely the first large-scale analysis of the occupation of Lomas and foothills on the Peruvian central coast.

Marcone, Giancarlo [9] see VanValkenburgh, Parker

Marder, Ofer [191] see Varoner, Oz

Marean, Curtis [90] see Carroll, Peyton

Marean, Curtis [68] see Fahey, Brian

Marean, Curtis [90] see Murray, John

Marín Calvo, Antonio [128] see López Luján, Leonardo

Marina, Flavia Carballo [92] see Taylor, William

Marino, Marc [220] see Fargher, Lane  
Marino, Marc [88] see Martin, Samuel

**Marken, Damien (Bloomsburg University)**

[54]

*Household Wealth and Urban-Rural Inequality at El Peru-Waka, Guatemala*

Located at the western edge of the Classic Maya heartland, El Peru-Waka' was one of the most densely aggregated urban cores in the lowlands. With households packed next to each other, it can be difficult to define where one ends and another begins.

Nevertheless, survey and excavation data suggest that differences in household provisioning and generational cycling created considerable variation in household wealth across the city. This paper will employ household area (m<sup>2</sup>) and volume (m<sup>3</sup>) calculate Gini coefficients for the El Peru-Waka' urban core and immediate hinterlands to quantify inequality across the urban landscape.

**Markert, Patricia (Binghamton University)**

[58]

*Moderator*

Marks, Theodore [46] see Hollingshead, Analise  
Marks, Theodore [90] see Leader, George

**Markussen, Christine (EnviroSystems Management Inc.)**

[137]

*Discussant*

Marom, Nimrod [85] see Lazagabaster, Ignacio

**Marquardt, William (University of New Mexico, United States Forest Service)**

[69]

*Exploring Changes in Gendered Labor: A Case Study from the Middle Rio Grande*

Gender, the cultural interpretation of a wide range of biocultural traits present in the human body, has played a fundamental role in organizing labor within human societies. At various points in human history, these gendered divisions of labor have been quite distinct in the archaeological and ethnographic records. However, like any other behavior, the patterns of gendered labor in a society are subject to change. In the Middle Rio Grande Valley (MRG), changing socioeconomic patterns from the Coalition to Classic periods (ca. AD 1000–1500) may have led to changes in patterns of gendered labor among the Ancestral Puebloan people who occupied the region. To test this hypothesis, this poster utilizes fingerprint impressions found on corrugated ceramic artifacts collected from two Coalition period sites (LA 151618 and LA 15260) and three Classic period sites (Pottery Mound, Tonque Pueblo, and Tijeras Pueblo) to estimate the biological sex of potters, a component of gender. Changes in the variation of fingerprint ridge breadth and density are analyzed to assess the potential impacts of the socioeconomic changes that occurred during the Classic period in the MRG may have had on the sex ratio of potters and the gendered organization of labor in the past.

Márquez Huitzil, Ofelia [146] see Amador, Julio

**Marreiros, Joao (UE, ICArEHB, MONREPOS), Juan Gibaja (CSIC-IMF) and Nuno Bicho (ICArEHB—Universidade do Algarve)**

[98]

*Revisiting and Modeling the Early Gravettian Occupation in the Southwestern Iberian Peninsula*

In paleoanthropological research, investigating the origins and nature of stone tool variability in the archaeological record is a key research topic for the understanding of the onset and establishment of human behavioral complexity. From the last decades of research, the expansion of Gravettian industries in Western Europe has been associated with the advent of different regional facies, which characterizes the so-called Gravettian techno-cultural mosaic. Regional micro-scale studies of the different lithic industries are crucial to explaining and describing such variability, and to understanding the ecological constraints responsible for the distinct human cultural dynamics. Research investigations on the Iberian Peninsula have advocated for the presence of a Gravettian polymorphism, previously unseen. In this scenario, the Gravettian lithic assemblages from the archaeological site of Vale Boi (Portugal) have revealed significant singularities among the Iberian territory. In this talk we revisit and discuss the results of the past decade and ongoing investigations on the Gravettian lithic industries of the site of Vale Boi, with special emphasis on combining techno-typological and functional analysis. Results are synthesized in a comprehensive model that aims to explain the organization and variability of the early Gravettian industries in the Iberian Peninsula.

Marreiros, Joao [191] see Paixao, Eduardo

Marroquín, Elizabeth [104] see Clark, Morgan

**Marsh, Erik (CONICET, Laboratorio de Paleo-Ecología Humana, UNCuyo, Argentina), Sharratt Nicola (Georgia State University) and Korpisaari Antti (University of Helsinki)**

[129]

*When Did Tiwanaku Rise and Fall? Leveraging Bayesian Models to Refine Heartland and Coastal Chronologies*

This paper presents a comprehensive refinement of Tiwanaku's chronology. We track independent site-by-site temporal trends in Redwares, monument construction, and residential occupation based on a complete compilation of radiocarbon dates, updated calibration curves, and Bayesian models of stratigraphic relationships. The results suggest that during cal AD 400–600, there was a large-scale migration to Tiwanaku. During cal AD 600–700, Redwares were only present at Tiwanaku itself; the Akapana and Pumapunku monuments were started and finished. Next, during cal AD 700–900, Redwares became widespread in the southern Titicaca Basin, Lake Titicaca islands, Moquegua, and Cochabamba. At Tiwanaku, there was an urban renewal around cal AD 900 but residential occupation ended around cal AD 1000. Offerings continued to be left until cal AD 1100, mostly around the Akapana. At other sites, occupations lasted until cal AD 1000–1050. On Lake Titicaca islands, temples were closed, and on the coast, communities started using new post-collapse ceramic styles. At Lukurmata, occupation peaked, coincident with intense use of raised fields, which were abandoned around cal AD 1150 as a regional drought started. These staggered trends prompt a reconsideration of the interaction networks that assembled and disassembled Tiwanaku.

**Marsh, Erik (CONICET, Laboratorio de Paleo-Ecología Humana, UNCuyo, Argentina)**

[129]

*Chair*

Marsh, Erik [157] see Barberena, Ramiro

Marsh, Erik [87] see Vranich, Alexei

Marsh, Erik [87] see Zovar, Jennifer

**Marshall, Aubree (Michigan State University), Gabriel Wrobel (Michigan State University), Rafael Guerra (University of New Mexico) and Jaime Awe (Northern Arizona University)**

[91]

*Before the Flood: Skeletal Analysis of the Chalillo Dam Salvage Collection*

A survey in the Upper Macal River Valley of Belize prior to the building of the Chalillo Dam identified multiple Maya sites. The Belize Valley Archaeological Reconnaissance (BVAR) performed salvage excavations in the area in 2003 and 2004 in an attempt to rescue as much archaeological information about these ancient communities as possible before their inundation. Because of time constraints, excavation focused on eastern structures because such structures were typically utilized as mortuary shrines and thus provide a wealth of data for interpreting the biosocial context of these sites. Skeletal remains of varying preservation were excavated. We present an overview of mortuary data from the sites of Garapata, Ramonal, Bejuco, Peligroso, and Bajo de Lago, along with the results of preliminary inventory and analysis of recovered skeletal remains. While salvage projects may not present complete pictures of sites, these studies are important in situations where sites may not always be accessible.

**Marshall, Fiona (Washington University)**

[16]

*Directionality in Large Animal Domestication, or Do I Really Want a Different Donkey?*

Notions of improved breeds inherited from nineteenth-century Europe emphasize the notion of a “better” animal and herder selection away from wild forms. However, increased size or production characteristics valued in Victorian Britain or in globalized industrial agriculture have obscured the value of traits that increased animal survival for many herders worldwide. The domestication of transport animals, dromedary and Bactrian camels, llama, and yaks provide insights into wild traits important for transport and survival in early domesticates. Intentional and casual interbreeding between large domesticates and wild relatives is well documented. Herder selection for strength, adaptation to extreme conditions, and range expansion is revealed by intentional hybridization, e.g., mules, Bactrian/dromedary crosses. Intentional breeding for survival and characteristics of wild forms that sustained often countered strong intentional selection away from wild phenotypes.

**Marshall, Lydia Wilson (DePauw University)**

[25]

*Marronage beyond Slavery?*

In the Americas, runaway slaves were widely known as Maroons. Following their self-emancipation, Maroons created diverse settlements, ranging from small encampments in North Carolina's Great Dismal Swamp to the highly sociopolitically complex polity Palmares in Brazil. This paper asks two questions. First, given this diversity, what (if any) strategies of self-determination did Maroon communities share? Second, which of these tactics were more broadly employed by groups wanting to disengage from colonial powers? In *The Art of Not Being Governed* (2009), anthropologist James C. Scott explicitly likened the state-avoidance strategies of Zomia hill communities in Southeast Asia to marronage. This paper thus asks, is marronage actually a much broader phenomenon than slavery itself? What is gained and lost through a widened perspective on the practice? This discussion is grounded in the analysis of three East African case studies: the fugitive slave villages Makoroboi and Koromio (Kenya) and the rocky inselberg, Lilangangondo (Tanzania), where oral histories attest local people retreated during slave raids and other attacks.

Marshall, Marilyn [215] see Lyons, Patrick

**Marston, John (Boston University)**

[126]

*Mapping Land Use with Integrated Environmental Archaeological Datasets*

Archaeologists have developed tools to reconstruct detailed aspects of agricultural systems: what crops were grown, how they were cultivated, and the environmental implications of those farming strategies. Within agropastoral economies, the locations of farming versus animal herding can be inferred from ecological and digital modeling of ancient landscapes, but determination of these locations can remain elusive in environments with evidence for substantial geomorphological and/or ecological change since the period of occupation. Archaeobotanical and geoarchaeological evidence from the site of Gordion, in central Anatolia, indicates substantial landscape change over the last 4,000 years, including deforestation, overgrazing, erosion, and aggradation, which have been inferred to be the result of past agricultural practices, but without specific locations (geographic and temporal) of farming and herding that caused these changes. Recent isotopic analysis of crop seeds and animal bones, however, offers an avenue toward identifying the locations of both crop production and animal husbandry on the landscape at different times. Integrating these data with archaeobotanical, zooarchaeological, and geoarchaeological evidence provides a more precise reconstruction of the sequence of agricultural practices that shaped the present landscape and ecology of the region, offering a model for future archaeological research within substantially transformed landscapes.

Martin, Debra [173] see Freiberger, Julia

Martin, Debra [69] see Ralston, Clairra

**Martin, John**

[134]

*Discussant*

Martin, Miles [90] see Carroll, Peyton

**Martin, Samuel, John Shaw (University of Arkansas), Chris Cathcart (University of Arkansas), Marc Marino (University of Arkansas) and Cory Hughes (University of Arkansas)**

[88]

*The Simulation in the Sandbox: Modeling ENSO River Channel Behavior Using Physical Experiments*

Anthropogenic modifications and differential land-use in arid, floodplain adjacent locations are disproportionately vulnerable to extreme inundation during climatic events, such as El Niño–Southern Oscillation. In reaches like the Chicama River of north coast Peru, high energy flows and precipitation can result in flash floods and overland flooding. Its hydrodynamics are controlled by the flux of water and sediment driven by climatic teleconnections and seasonality. Flux directly influences alluvial topography throughout the geological lifetime of rivers and likely influenced human settlement patterns in the region. However, channel variation from flux is difficult to track due to the erosion and deposition of material “shredding” prior signals associated with flood frequency and channel occupation timing, confounding interpretations of settlement history. To address this, we demonstrate that a Leeder-Allen-Bridge physical tank can be used to examine channel and floodplain development on a dimensionless timescale. Our model, linearly scaled to the characteristics of the Chicama River alluvial fan using a t-scour relationship, demonstrates that alluviation, ancient land use, site choice, and increasing flood risk may be linked. Using replicated flood events to mimic volatility, we found that floods produce markers of the river’s maximal extent that is rarely breached, except during powerful, high-flux events.

**Martin, Simon (University of Pennsylvania Museum)**

[128]

*Maize Odyssey: Life, Death, and Transformation in Classic Maya Mythology*

Karl Taube played the central role in recognizing and illuminating the Classic Maya maize deity Juun ixim in the 1980s. While the skeleton of this key divinity’s narrative—a journey into the Underworld—has been deduced from art and writing since then, there is still much to discover about the sequence and meaning of the individual episodes recorded. Using some little-studied materials, this paper aims to further our understanding and reassess what is known and what yet remains to be discovered.

Martindale Johnson, Lucas [206] see Davis, M. Kathleen

Martindale Johnson, Lucas [187] see Freund, Kyle

**Martinez, Antoinette (California State University, Chico) and Frank Bayham (California State University, Chico)**

[121]

*A Testament to Kent Lightfoot’s Academic Legacy*

The recognition of scholarly genealogy and how institutions and mentors shape the perspectives that inform teaching provides the opportunity to honor our friend, colleague, teacher, and mentor, Kent Lightfoot. We present a brief background of our association with Kent and then address the next generation by highlighting the student research and masters theses at California State University, Chico, that draw from the concepts that have been central to his career: multiple lines of evidence, inclusivity, and

studies in long-term time depth. These serve as a testament to the endurance of the scholarly traditions championed by Dr. Lightfoot.

Martinez, Desirée [66] see Lippert, Dorothy

Martinez, Gustavo [11] see Hansen, Richard

### **Martinez, Jupiter (INAH-Sonora)**

[86]

*Looking into the Viejo Period in the Sonoran Sierra Madre and Further Back*

The Casas Grandes Medio period remains the investigative focus in the Sierra Madre Occidental because it represents the maximum recorded population density in this region. During the Hispanic period, however, this region became a refuge for Apache groups with the historical record blurring earlier prehistoric occupations. The Sierra Alta de Sonora Archaeological Project (SASAP) conducted several excavations at cliff dwellings and adobe compounds in the Sierra Madre Occidental. Although all of these sites had Casas Grandes components, they also contained far greater quantities of textured as opposed to painted ceramics. For instance, an early midden deposit from a cliff dwelling was composed of only plain and textured ceramics. The manufacture of textured pottery in Sonora initiated long before the Casas Grandes Medio period and is considered part of the Rio Sonora archaeological tradition of the first millennium AD. However, the Mogollon ceramic tradition possessed many similar ceramic types, which leads to the question of wherefrom this tradition of textured ceramics derived. In this paper, I present ceramic data from the sites documented as part of the SASAP, discuss the variety and quantity of textured types, and propose a probable northern origin for their development.

### **Martinez, Marco**

[118]

*Rethinking Indigenous Cultural Development in the Casas Grandes Valley Post-European Occupation*

Early inferences regarding the development of the Casas Grandes culture relied on classical themes that explained the life history of social polities in terms of expansion and collapse, followed by complete land abandonment. In northern Mexico, these themes tend to intersect with narratives produced by the Spanish during the sixteenth to seventeenth centuries to justify European colonization, such as the "discovery" of inhabited or abandoned lands and lands inhabited by hunter-gatherer groups regarded as lacking ties to their territories the way farming societies do through permanent settlements. Early archaeological research echoed this narrative, deeming the Casas Grandes culture an offshoot from a different region and disappearing before European arrival. Michael Whalen and Paul Minnis became pioneers by producing a new frame of thought that regarded the development of the Casas Grandes culture as a local phenomenon interconnected to multiple processes of cultural change in the region and beyond. Their approach was a reaction to unsatisfactory methods and an emerging criticism of traditional assumptions of cultural development. Recently, Michael Whalen has further contributed to this approach by reframing the apparent lack of typical Casas Grandes artifacts during the onset of European arrival as a matter of cultural continuity rather than abandonment.

### **Martinez, Marcos (Arizona State University)**

[22]

*Spatial Models of  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  Modern Plant Distributions Across the South Central Andes*

Isotopic ratios of actively cycled elements, such as the differences in plant photosynthetic pathways influence on  $\delta^{13}\text{C}$  values and the nitrogen cycle's influence of  $\delta^{15}\text{N}$  values, vary systematically across the natural environment. Spatial variation in isotopic expression offers significant information regarding past diet and environmental interactions, but the development and further refinement of isotopic baselines is often understudied. Using regression analysis in concert with IsoriX, an open-source R-based package designed to model spatial patterns of isotope ratios (isoscapes) and infer the geographic origin of samples based on their isotopic values, I model the geographic variation in  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values from modern isotopic plant baseline samples from previous work in the south-central Andes ( $n = 187$ ). These results provide insight into the distribution of  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values in the region and should stimulate further research on the use of multi-isotope spatial models for more refined paleodietary and paleoecological studies.

Martinez, Maria [149] see Brandl, Michael

Martinez-Lira, Patricia [23] see Arroyo-Cabrales, Joaquín

### **Martínez Martínez, Xóchitl**

[73]

*Elementos de la arquitectura de Monte Albán en Atzompa: Los tableros doble escapulario de las unidades residenciales y templos*

El tablero es un elemento de la ornamentación arquitectónica común en las regiones de Mesoamérica. En Oaxaca, el desarrollo del característico tablero doble escapulario se puede apreciar muy claramente en tiempo y espacio en sitios arqueológicos desde Monte Albán hasta Mitla. Entre los aportes realizados por el Proyecto Arqueológico del Conjunto Monumental de Atzompa (PACMA), se han explorado tableros en unidades residenciales, entre las que destacan la Casa de los Altares y la Casa del Sur, y en templos, cuyo mejor ejemplo es el Edificio 4. En Atzompa se ha descubierto que los tableros contenían "discursos" que

plasmaban mensajes de poder, linajes, y religión. En esta ponencia se presenta un análisis comparativo con base en la evidencia arqueológica, la arquitectura y las dimensiones de diversos tableros, que nos permite avanzar en el estudio de estos elementos emblemáticos.

**Martínez Martínez, Yazmin (Escuela Nacional de Antropología e Historia)**

[73]

*La producción de cerámica en Atzompá durante el Clásico Tardío, una aproximación a sus características tecnológicas*

El estudio de la cerámica de Atzompá, uno de los enclaves urbanos de Monte Albán, que alcanzó su máxima expresión cultural durante el Clásico Tardío (500–900 dC), ha permitido proponer una estandarización en las formas cerámicas producidas. Ligado con los contextos de su producción, herramientas y desechos denotan una producción artesanal sumamente longeva y consolidada en el sitio. La producción cerámica es un proceso que incluye actividades como la selección de materia prima, la preparación de arcilla con desgrasantes, la manufactura de las vasijas, el acabado de superficie, la decoración, la cocción y en casos la re-decoración. Este cúmulo de pasos va de la mano con los conocimientos específicos para realizar dichas acciones, que en conjunto forman un sistema tecnológico. Este trabajo es un acercamiento al estudio de la cerámica de Atzompá, que busca comprender un poco más acerca de la complejidad en los procesos de producción y sus características tecnológicas, aportando algunos datos sobre estos componentes que caracterizaron a este “barrio” de Monte Albán.

**Martínez-Polanco, María**

[125]

*What Do the Deer Tell Us about the Ancient Inhabitants of Parita Bay in Panama?*

The area of Parita Bay in Panama presents a long sequence of human occupations from preceramic groups to complex politicized societies (Cerro Mangote [7800–4600 cal yr BP], Sitio Sierra [2200–500 cal yr. BP] and Cerro Juan Díaz [300 BCE–1600 CE]). The white-tailed deer (*Odocoileus virginianus*) was dietarily and culturally by far the most important mammal in this area. In order to better understand human and deer relation across time and space, a multiproxy approach was proposed to study deer samples, including zooarchaeology, taphonomy, mesowear, microwear, and stable isotope analysis. The results shows that white-tailed deer was an animal with restricted access because of its polysemic ritual significance at Parita Bay, particularly within the Greater Coclé semiotic system. The zooarchaeological record of Parita Bay shows that human groups did not rely on white-tailed deer, but had a broad-spectrum diet. The study of white-tailed deer in the archaeological record of this area does not indicate an intensification of deer hunting, but was constant along the human occupation sequence into modern times.

Martínez Vázquez, Dante [174] see Navarro Sandoval, Fernanda

**Martini, Sarah (Yale University) and Ana Montoya Cabrera (Universidad Nacional Pedro Ruiz Gallo)**

[92]

*Ayabaca before the Inca: Archaeological Possibilities in the Highlands of Peru between the Northern and Central Andes*

Although located in a key region to investigate the supposed millennia-old borderland between the Central and Northern Andean culture areas, little archaeological research has been undertaken in the province of Ayabaca in the department of Piura in the highlands of far northern Peru. While the modern border dispute between Ecuador and Peru stymied research for decades, few projects have entered the area even after the resolution of the conflict with the Brasilia Presidential Act of 1998, and what research has been undertaken has focused on the Inca and their immediate predecessors. This poster follows up on the two survey-based projects that did take place in Ayabaca and, often tangentially, recorded pre-Inca sites: that of Mario Polia in the 1970s–1990s and that of Cesar Astuhuaman and his students in the 1990s–2010s. We present photos of new sites and material culture observed in the summer of 2021, evaluate the state of preservation of previously recorded sites, and discuss the importance of this region to understanding not only the development of prehistoric borders between the Central and Northern Andes over the *longue durée*, but also cross-border connections and interactions between peoples of what are now Ecuador and Peru.

Martins, Maria do Rosário [18] see Vázquez de Ágredos Pascual, María Luisa

**Martisius, Naomi (University of Tulsa), Danielle Macdonald (University of Tulsa) and Lisa Maher (University of California, Berkeley)**

[183]

*Taking It Up a Notch: Epipaleolithic Bone Notching at Kharaneh IV (Jordan)*

Hunter-gatherer aggregation and interaction during the Late Pleistocene highlight the complexities of movement and community prior to sedentism. At the Epipaleolithic site of Kharaneh IV, Jordan, there is evidence for intensive occupation with a wide diversity of material culture including quotidian objects like lithics and faunal remains, as well as unique cultural items such as engraved stone “art” and shell beads. In this paper we explore a set of enigmatic bone objects from the Early and Middle Epipaleolithic occupations at Kharaneh IV. These modified bone “tools” exhibit series of patterned notches, incised into diverse modified and unmodified skeletal elements from taxa such as gazelle and aurochs. Similar objects from earlier Paleolithic deposits in Eurasia and Africa have been interpreted as notation devices or artistic expression, however the cultural function of these items during the Epipaleolithic is unknown. To further explore these bone objects, we present the results of microwear analysis using light-microscopy and confocal microscopy to both image and measure the manufacturing traces used to make the notches. Identifying patterns in notching, we ask whether these objects were notational devices, potentially linked to tracing movements, interactions, or events at the aggregation site of Kharaneh IV, or served other cultural purposes.

Marwan, Norbert [47] see McCool, Weston

Marwick, Ben [40] see Park, Gayoung

Mason, Owen [31] see Mayeux, Camille

**Massey, Sarah (Independent Researcher), George Chauca I (Pontificia Universidad Católica del Perú) and Cesar Durand P (Independent Researcher)**  
[92]

*Los geoglifos de Tajahuana del valle medio de Ica, Peru*  
[WITHDRAWN]

Massigoge, Agustina [85] see Belardi, Juan

**Masucci, Maria (Drew University)**

[150]

*Gathering for the Ancestors: Tracing Communities of Practice through Guancavilca Ritual Ceramics, Colonche Valley, Ecuador*  
The 2015 discovery of stone sculptures in the Colonche Valley, Ecuador, has opened new opportunities for archaeological research. Regional survey has since revealed an extensive series of Guancavilca tombs, adobe platforms and stone features from ca. 800–1532 CE. Analyses of surface ceramics and looted tomb contents identify vessel types common to tombs, platform and stone sites but with differences in micro-stylistic and production choice differences. Placed into the context of the author's comparative data of stylistic and compositional studies of the ceramics from the southwest coast it is hypothesized that the individuals or communities associated with the ceramics, entombments, and activities at the hilltop sites were not all residential in the immediate valley. Instead, the burial, platform, and possible grain storage sites were gathering places for individuals from communities across the southern coastal region. This time period is one of shifts in settlement and economy, ritual practices and increasing sociopolitical complexity. The research therefore offers not only a powerful test case for the use of compositional analyses for identifying potential communities of practice but also revealing the role of such gatherings and interactions in this key period of ethnogenesis of the Guancavilca of coastal Ecuador.

**Masur, Lindi (University of Toronto)**

[28]

*Vegetal Agency and the Taste of Place: Relationships with Flavorful Wild Plants in the Agricultural Landscapes of the Lower Great Lakes*

This paper considers how wild plants, and in particular flavorful weedy species including staghorn sumac (*Rhus typhina*) and brambles (*Rubus* spp.), were active agents in shaping the Late Woodland agricultural landscapes of southwestern Ontario. By taking a relational approach to human-plant interaction and considering plant personhood, I highlight how sumac and bramble negotiated their rights to new fields and settlements, enticing Western Basin community members at the Arkona cluster sites (ca. AD 1000–1300) with their tart fruit, and eventually becoming part of long-term culinary traditions.

Mataloto, Rui [108] see Lewis, Brandon

Mataloto, Rui [108] see Soares, Justin

**Mathiowetz, Michael (Independent Scholar)**

[128]

*"The Lord of the Waters": Tlaloc and Rainmaking in the Aztlán Region of West Mexico and the Relation to Puebloan Katsina Ritualism in the Southwestern United States*

Scholars have long noted that Puebloan people of the southwestern United States and various Mesoamerican societies share fundamental cosmological tenets linking ancestors to rain within a suite of rain- and cloud-making metaphors and ritualism. A new form of rain/cloud/wind symbolism began to appear in various media around AD 900–1000 in the Mogollon region of the southern Southwest that intensified after AD 1200–1300 in northern Mexico and the broader Puebloan world in the US Southwest. Parallels have been documented between the Mesoamerican goggle-eyed rain deity Tlaloc and Puebloan rain chiefs and katsinam. While comparisons were drawn to highland and southern Mesoamerican manifestations of this deity, this presentation examines the archaeological evidence of Tlaloc ritualism within the Aztlán tradition of west Mexico and the ethnohistorical and ethnological legacy of rainmaking ideologies of presumed descendant cultures of the Gran Nayar region. Building on Karl Taube's pioneering research on these ideological connections, I examine the appearance of Tlaloc ritualism in coincidence with a new solar- and maize-related Flower World ideology after AD 850/900 in the Aztlán region. This social-religious transformation appears to have been a key inspiration for the development of Mogollon and Puebloan katsina rainmaking ideologies to the north.

Mathiowetz, Michael [14] see Beekman, Christopher

**Mathwich, Nicole (San Diego State University), Priscilla Hernandez (San Diego State University), Carolina Ocana (San Diego State University) and Gina Dee (San Diego State University)**

[85]

*Situating Misión Dolores de Cósari: Emergent Regional Ranching Practices in Spanish Colonial Sonora*

In the Pimería Alta, today Sonora and southern Arizona, Spanish missions and presidios were the primary points of interaction between these new animals and the diverse indigenous groups and Spanish-sponsored priests and soldiers. This paper explores the ecologies of colonialism in the Pimería Alta through the first introduction of livestock to the region. The O'odham village of Cósari was first visited by Father Kino in 1687, and subsequently became the local cabecera, Misión de Nuestra Señora de los Dolores de Cósari. Dolores was home to the source herds for other missions in the region and later Alta California. We present faunal data from Misión Dolores and compare it to contemporary Santa Cruz River Valley sites where the majority of archaeological investigations on the Spanish colonial period have been conducted. Strong similarities in resource use were observed among Santa Cruz colonial settlements and Misión Dolores, despite its 130 km distance from the northern mission sites. We argue that these findings suggest a regional pattern of colonial resource use emerging from environmental constraints, colonial goals, and O'odham labor and knowledge. These patterns emerged early in the colonial period and became the foundation for modern ranching culture and cuisine in the Sonoran Desert.

Matias, Roxane [186] see Skosey-LaLonde, Elena

**Matsumoto, Mallory (University of Texas at Austin)**

[49]

*Other-Than-Human Scribes and Classic Maya Ritual Community*

In the Classic Maya (250–900 CE) lowlands of Mesoamerica, hieroglyphic writing represented a mode of ritual performance at the intersection of individual practice, public reception, and other-than-human engagement. As Michael Coe first argued, the script's origins, like those of Classic Mayas themselves, were rooted in a primordial past in which the earliest humans had acquired writing from otherworldly sources. One manifestation of this supernatural component was a range of other-than-human scribes depicted in Classic Maya iconography. Drawing on evidence from iconographic, archaeological, and ethnohistorical sources, I discuss what representations of these diverse scribal figures tell us about a hieroglyphic tradition that by the seventeenth century had largely fallen dormant. Other-than-human scribes represented a parallel, ritual community that shared behaviors and tools with their human counterparts yet assumed a distinct physical form. Their ontological status implied a closer link to the script's cosmological roots, yet they shared with humans an engagement in the ritually significant act of writing. Other-than-human scribes thus reminded Classic Maya viewers of hieroglyphic technologies' role in constructing a ritual community whose origins and significance extended far beyond the scope of human experience.

**Matsumoto, Yuichi**

[192]

*Identifying "Branch Shrine" in the Chavín Interaction Sphere*

In the history of Andean archaeology, the site of Chavín de Huántar has been considered an important center and principal oracle of a religious cult. In this context, it is important to note that Richard Burger has convincingly hypothesized that the spread of the religious cult generated at Chavín de Huántar, referred to as Chavín cult, caused a socioeconomic transformation in a wide geographic area during the Early Horizon. Burger's model of pilgrimage network centered on Chavín de Huántar is constructed through careful use of ethnohistorical and ethnographic analogies and in this model "branch shrines" played an important role in transmitting the religious cult in the distant area of the Central Andes. While scarce archaeological data made it difficult to evaluate the branch shrine when Burger proposed this model in 1988, recent advance of the archaeological research in the areas distant from Chavín de Huántar allow us to identify possible examples of "branch shrine" such as Campanayuq Rumi in the Peruvian south-central highlands and evaluate their roles in interregional interactions and regional socioeconomic transformations. This paper explores the nature of these "branch shrines" of the Chavín interaction sphere from regional perspectives based on recent archaeological data.

Matsumoto, Yuichi [129] see Tsurumi, Eisei

Mattson, Hannah [173] see Haffner, Jacob

Mattson, Hannah [173] see Lujan Sanders, Mariana

**Mauldin, Raymond (UT San Antonio), Leonard Kemp (UT San Antonio), Cynthia Munoz (UT San Antonio), Clinton McKenzie (UT San Antonio) and Sarah Wigley (UT San Antonio)**

[114]

*Black Vulture Shelter, a Terminal Late Prehistoric Occupation at the Edge of the Southern Plains*

The Center for Archaeological Research and the Southern Texas Archaeological Association conducted excavations at Black Vulture Shelter on the Edwards Plateau in Central Texas. Preliminary analysis of artifacts and faunal material, bolstered by multiple radiocarbon dates, suggests that the shelter was used for a series of short-term occupations during the Terminal Late Prehistoric Toyah Interval (AD 1250–1650). The bulk of the material occurs within a single 15 cm zone in a 3 × 2 m area surrounding a clay-lined hearth. Recovered material from this zone includes several bison ribs, Perdiz arrow points, and over 800 pieces of debitage. Three radiocarbon dates from this zone, including a direct date on a bison rib and a charcoal date from the hearth, overlap and demonstrate that this primary occupation occurred between AD 1500 and 1600. The recovered assemblage from the shelter is atypical in that the more commonly recovered Toyah material remains, such as beveled knives, formal end scrapers, and ceramics,

are absent from the assemblage. The overall assemblage and the spatial distribution of material are consistent with several occupations of the shelter by small groups, likely focused on a limited number of tasks, at the close of the prehistoric sequence.

Maurer, Joanna [127] see Wholey, Heather

**Mauricio, Ana (Pontificia Universidad Católica del Perú), Alice Kelley (University of Maine), Daniel Sandweiss (University of Maine), Francisco Rumiche (Pontificia Universidad Católica del Perú) and Rolf Grieseler (Pontificia Universidad Católica del Perú)**

[88]

*El Niño and the Origins of Adobes in the Americas*

Adobe bricks are central elements of the Andean earthen architectural tradition, as in other areas of the world. Mainly composed of clay-rich sediments, temper materials, and water, adobes are sun-dried bricks used in construction. In Peru, adobes are the main components of prehispanic, colonial, and even contemporary earthen buildings. Elsewhere, approximately 30% of the world's population—50% in developing countries—live in mud brick structures. Although several investigations of Peruvian adobes have dealt with composition and other technical properties, these studies have focused on late prehispanic and contemporary examples and are mainly concerned with conservation. None of the available studies investigated the origin of adobes or their technological evolution. For this reason, adobes have been seen as an immutable technology. However, a recent multidisciplinary geoarchaeological investigation of adobe bricks exposed at an archaeological site on the north coast of Peru indicates adobe architecture originated in the Americas in the Preceramic period, most likely with the use of bricks cut from El Niño alluvial deposits. We propose that adobe architecture became a major Andean tradition after a long period of technical evolution and experimentation with both, shape and composition and that this sequence began by using available natural materials.

Mauricio, Ana [148] see FitzPatrick, Mackinley

Mauricio, Ana [88] see Kelley, Alice

Mauricio, Ana [3] see Ventura, Renzo

Maximo, Bruno [154] see Klokler, Daniela

**May, Hila (Dan David Center, Faculty of Medicine, TAU), Rachel Sarig (Goldschleger School of Dental Medicine), Cinzia Fornai (University of Zurich), Gerhard Weber (University of Vienna) and Israel Hershkovitz (Dan David Center, Faculty of Medicine, TAU)**

[191]

*Nesher Ramla Homo: A New Middle Pleistocene Paleodeme*

*Homo* fossils dated to the Middle Pleistocene (MP) are relatively scarce in the Levant and their taxonomic affiliation debated. Cranial elements (parietal bones), and an almost complete mandible including a second molar tooth, were exposed in Unit VI at the Nesher Ramla site and were dated to ca. 130k BP. Comprehensive morphological analyses of these human remains demonstrated a unique combination of Neanderthal and archaic traits, which was not recognized previously in other MP *Homo* groups: while the parietal bones exhibited affiliation to archaic MP *Homo* fossils (e.g., Atapuerca SH), the mandible and tooth were more Neanderthal-like. The distinctive combination of traits shown by the NR fossils and the possible association of other Levantine fossils with this group (e.g., Qesem and Zuttiyeh) suggest that NR *Homo* is probably a late survivor of once a large Levantine MP paleodeme that existed in the region from at least 400,000 years ago. Besides their likely contribution to the evolution of the MP *Homo* in Europe and East Asia, they probably interbred with *Homo sapiens* that lived simultaneously in the Levant since 180,000 years ago. This research supports the hypothesis that the Neanderthal lineage, at least partially, originated from a non-European *Homo* stock.

May, Hila [191] see Yeshurun, Reuven

May, Jan-Hendrik [10] see Meyer, Michael

**May, Keith (Historic England, University of South Wales), James Taylor (University of York) and Ceri Binding (University of South Wales)**

[78]

*The Matrix: Connecting, Resurrecting, and Reusing Digital Records, Analyses, and Archives of Archaeological Investigations*

Stratigraphic laws and principles underpin the archaeological records from excavated sites and are essential for integrated analysis, wider synthesis and accessible digital archiving of the growing body of archaeological data and reports generated through the commercial and research work of the archaeological sector in the UK and internationally. On most excavated sites the stratigraphic record, often visualized and to a degree quantifiable, in the form of a stratigraphic matrix, acts as a primary, if not the primary piece of evidence for how, and in what order, the site was excavated. However, such primary records are often only held on paper or scanned copies of matrix diagrams that cannot easily be reused with associated data. Often the key phasing data needed for reuse in synthesis work and interpretive understanding, let alone Bayesian Chronological modeling, is not consistently documented, if at all, in written reports. This results in key records being unsearchable or remaining unconnected and lacking interoperability with other data (unFAIR). This paper will present work undertaken by the UKRI funded Matrix project [AH/T002093/1], which is addressing some of the current problems caused by the lack of standardized approaches to analysis and digital archives of archaeological stratigraphic and phasing data.

**Maybee, Brooke (Binghamton University), David Mixter (Binghamton University) and BrieAnna Langlie (Binghamton University)****[22]***Eucalyptus: A Symbol of Colonial Transformation in the Andes*

Eucalyptus is endemic to Australia and Tasmania, yet its modern presence in the Andes has not been fully explained. At first glance this plant seems rather beneficial, with its ability to provide shade, lumber, medicine, and preserve original ancient terrace structures; however, planting the tree destroys and acidifies the soil, making future crop cultivation impossible. To investigate this historical transformation of the land, eucalyptus was identified and quantified from satellite imagery. Additionally, the location of eucalyptus forests was correlated with anthropogenic landscapes and cities. From this analysis, we found these trees located primarily on abandoned terraces and facing city valleys. Additionally, historical research was undertaken to better understand the motivations driving the planting of these trees. Both GIS analysis and historical research indicate the location where eucalyptus was planted reflects the colonial shift from traditional extensive labor practices to nucleated and bounded agricultural plots that made crops, animals, and people more controllable for the Viceroy. In sum, by identifying where the trees overtook the place of native crops, forever changing the soil, this paper demonstrates how planting eucalyptus is symbolic of broader imperial relationships.

**Mayeux, Camille (Université Paris 1 Panthéon-Sorbonne), Claire Alix (Université Paris 1 Panthéon-Sorbonne), Owen Mason (Institute of Arctic Alpine Research) and Christophe Petit (Université Paris 1 Panthéon-Sorbonne)****[31]***Archaeoentomology and Archaeobotany within Three Neo-Inuit Houses in Northwest Alaska: Insights into Site Taphonomy and Domestic Practices*

In this paper, we present the results of archaeoentomological and archaeobotanical analyses from three winter Birnirk and Thule houses at Cape Espenberg in northwest Alaska that were inhabited between the late twelfth and fourteenth centuries, during the onset of the Little Ice Age. Analysis of invertebrate and plant remains presents a robust entomological and botanical signature of human activities at Cape Espenberg. While secondary deposits, termed "fill" layers, contain only insect and plant assemblages characteristic of the local environment, primary occupation levels contain a high concentration of invertebrates that are specific to organic-rich areas and can be linked with cultural uses attested by ethnohistorical accounts. In addition, the spatial distribution of insects and plant remains reveal considerable variability between the houses.

**McAnany, Patricia (University of North Carolina, Chapel Hill)****[195]***Moderator*

McBride, Michael [206] see Eberl, Markus

McBride, Michael [206] see Estrada Aguila, Rebecca

**McCafferty, Geoffrey (University of Calgary) and Sharisse McCafferty (University of Calgary)****[209]***Back to Camp Granada: The 2021 Field Season at El Rayo, Nicaragua*

El Rayo (Nicaragua) continues to offer unique insights into the cultural changes that occurred during the Ayala to El Rayo period transition (600–1250 CE), when Oto-manguean-speakers migrated from central Mexico and integrated with native Chibchan populations. The fifth field season at El Rayo was supported by the Institute for Field Research. Field school students excavated at four loci: a deeply stratified area with rich material culture possibly relating to feasting activities, a dispersed cemetery with El Rayo period urn burials, a low mound with stone architecture, and a locus near the shore of Lake Cocibolca with high incidence of exotic artifacts. Results further inform on the dramatic developments as the resident population adapted into what has been identified as the Chorotega culture, with changes to the mortuary practices and ceramic ecology.

**McCafferty, Geoffrey (University of Calgary)****[209]***Chair*

McCafferty, Geoffrey [187] see Kyle-Robinson, Lachlan

McCafferty, Geoffrey [125] see Megan, Parker

McCafferty, Sharisse [209] see McCafferty, Geoffrey

McCall, Laura-Isobel [173] see Haffner, Jacob

**McCartin, Madison (University of Tübingen), Britt Starkovich (University of Tübingen), Samantha Brown (University of Tübingen) and Nicholas Conard (University of Tübingen)****[85]***New Zooarchaeological Approaches to the Magdalenian Faunal Assemblage from Petersfels (Hegau Jura, SW Germany)*

Prior zooarchaeological research at the Magdalenian site of Petersfels (SW Germany) has provided excellent responses to the question: What were people eating? Namely, reindeer. However, research questions that go "beyond" diet and subsistence are far

from exhausted. Unstudied faunal remains from excavations in the 1980s provide a new opportunity to assess such questions using modern zooarchaeological and biomolecular methods. Detailed taphonomic analysis of the assemblage sheds light on the various anthropogenic (e.g., the socioeconomic implications of spatial organization and butchery practices) and nonanthropogenic processes (e.g., carnivore damage) at the site. The application of Zooarchaeology by Mass Spectrometry (ZooMS) provides additional information on species diversity, as well as the presence of exotic species other than the main prey animals (e.g., reindeer, hare, and horse). Lastly, the analysis of osseous tools investigates the use of faunal remains as a raw material. These various lines of evidence come together to paint a more holistic picture of human-animal interaction at the site beyond what is already known about Magdalenian diets.

**McClanahan-Simmons, Angela (Western Illinois University)**

[50]

*Cultural Projects, "Edgelands," and the Permanent Reimagining of Landscape*

This paper proposes that Boris Groys's claim about contemporary life as mediated and understood via an ongoing, cyclical loop of speculative, unfinished cultural "projects" can be used to explore the production of particular kinds of interfaciality and "edgelands," as defined by Marion Shoard in 2000. In it, I look at a region of North Edinburgh and an urban site in Detroit which have both seen redevelopment projects begun and abandoned over the last three decades, and where decaying construction materials, construction boundaries and rezoned "development" areas are constantly revalued and reinhabited by humans and nonhumans. Using images and fieldnotes from site explorations of both sites at different points in time, I demonstrate how Groys's and Shoard's concepts, most notably applied in art, media theory, and planning contexts, respectively, can be useful archaeological tools for examining the production of waste landscapes.

**McCloskey, Galen (Tierra Right of Way Services)**

[113]

*New Research into Previously Unrecorded Sites in Northwestern Arizona*

New data on hundreds of archaeological sites from the Arizona Strip in northwestern Arizona presents the opportunity for new research into the region. This research analyzes GIS and quantitative data to look for settlement patterns, which potentially could be useful for predictive modeling. The settlement analysis focuses on four areas, totaling 12,842 acres, distributed throughout the Arizona Strip. Sites will be compared based on artifact and feature composition, and their location on the landscape.

**McClung de Tapia, Emily (IIA-UNAM, Mexico) and Laura Beramendi-Orosco (IG-UNAM, Mexico)**

[163]

*Landscape Formation/Transformation in the Prehispanic and Colonial Teotihuacan Valley*

Between 1992 and 2017, over 30 stratigraphic profiles were excavated in different sectors of the Teotihuacan Valley, from which a total of 106 radiocarbon determinations from soil organic material (SOM) or charcoal were obtained. Through the years, as profiles were studied and radiocarbon results became available, different hypotheses concerning landscape and soil development in the region were proposed. A Bayesian analysis of the determinations is underway in order to refine the chronology of alternating periods of landscape stability (soil development) vs. instability (erosion/deposition). These recent results are compared with sequences proposed in earlier publications in order to better characterize landscape formation in the region and relate changes to cultural processes in the Teotihuacan Valley.

**McClure, Sarah, Nicholas Triozzi (UC Santa Barbara), Hugh Radde (UC Santa Barbara), Shayla Monroe (UC Santa Barbara) and Emil Podrug (Sibenik City Museum, Croatia)**

[122]

*Livestock Management and Community Cohesion in Neolithic Dalmatia*

Neolithic agropastoral adaptations on the Dalmatian coast of Croatia underwent numerous shifts. Among livestock, Early Neolithic farmers focused most of their efforts on sheep and goat management. Despite a continuation of sheep and goat dominating archaeofaunal assemblages, Middle Neolithic strategies included multiple birthing seasons and episodic transhumance practices, likely to increase dairying in concert with other agricultural intensification. In contrast, Late Neolithic evidence suggests a reorganization of livestock management away from the dominance of sheep and goats to a more balanced portfolio including cattle and pigs. This presentation examines the potential social and environmental ramifications of these shifts in livestock management through time, particularly the degree to which populations in separate villages were coordinating their pastoral activities and sharing a common strategy. Using ecological, ethnohistoric, ethnographic, and modeling data, we suggest the observed shifts in livestock management give insight into significant environmental and social shifts occurring during this period that may be examined using other types of archaeological datasets.

**McClure, Sarah**

[122]

*Discussant*

[122]

*Chair*

**McCool, Weston (University of Utah), Brian Coddington (University of Utah), Kurt Wilson (University of Utah), Norbert Marwan (University of Potsdam) and Douglas Kennett (University of California, Santa Barbara)****[47]***Climate Change Induced Population Pressure Drives High Rates of Lethal Violence in the Prehispanic Central Andes*

Understanding the influence of climate change and population pressure on human conflict remains a critically important topic in archaeology. Yet studies that systematically quantify the relative effect of these variables among prehistoric populations remain limited. Importantly, climatic and demographic factors have both been shown to influence the frequency and severity of human conflict. The interaction between climate and demography further amplifies these dynamics, as climate change may structure population growth and carrying capacity and both climate and population influence per capita resource availability. As such, understanding the manners in which climate and demography interact to drive violent conflict remains a difficult and essential task. This presentation couples paleoclimatic and demographic data with osteological evaluations of lethal trauma from 149 directly AMS <sup>14</sup>C dated individuals from the Nasca highlands of Peru. Multiple local and supra-regional precipitation proxies are combined with a summed probability distribution of 149 <sup>14</sup>C dates to estimate population dynamics during a 700-year study window. Our analysis reveals a precipitous increase in violent deaths associated with a period of stable climate but volatile population dynamics. We conclude that favorable climate conditions fostered rapid population growth that drove violent resource competition resulting in over 450 years of chronic warfare.

**McCool, Weston (University of Utah)****[47]***Chair*

McCool, Weston [129] see Arkush, Elizabeth

McCool, Weston [51] see George, Richard

McCool, Weston [47] see Vernon, Kenneth

McCool, Weston [47] see Wilson, Kurt

**McCormick Alcorta, David Rafael (Yale University) and Felipe Trabanino (Universidad Autónoma de Campeche)****[62]***Zonal Complementarity at Cotzumalhuapa, Guatemala*

The Southern Maya Region is made of the tightly spaced geographic zones of the volcanic highlands, piedmont, and coastal Pacific plain. This zonal distribution created a natural economic interdependence based on zonal complementarity (Love 2007). While many of the commodities exchanged through these zones are known from ethnohistoric records, far less is known about the movement of goods in the region prior to the arrival of Europeans. Recent geochemical analyses of obsidian and ceramics as well as recent paleoethnobotanic data from Cotzumalhuapa, Guatemala, demonstrate multidirectional exchanges going through this Classic period piedmont urban center.

**McCoy, Mark (Southern Methodist University), Jesse Casana (Dartmouth College), Austin Chad Hill and Adam Johnson (Southern Methodist University)****[126]***Fields, Farmers, and Food Surplus: The Results of New Surveys by Unpiloted Aerial Vehicles in the North Kohala District, Hawai'i Island*

There is a broad consensus that farmers living in the Hawaiian Islands produced food surpluses that fed a growing population and were collected to support the larger political economy. These taxes were used to feed non-producers, such as members of the hereditary elite, priesthood, and military, and to provision feasts. In the leeward half of the North Kohala District the question of how much food surplus could have been produced by different communities has been estimated based on computer models that leveraged our knowledge of local farming conditions (rainfall, soil nutrients), and known community boundaries. Local variability in food surpluses over the long term would have had serious impacts to life expectancy. In this study we bring together the results of a series of new surveys by Unpiloted Aerial Vehicles (UAV), Hawai'i Island to try and determine how closely modeled population density matches the distribution of habitation features. UAV flights included high resolution visible light, infrared, and lidar survey platforms over several square kilometers. Our analyses build on the results of previous lower resolution airborne lidar remote sensing, full-coverage GPS survey, excavations, and data from experimental gardening, and our results address a variable critical to understanding the agricultural landscape.

McCoy, Mark [154] see Sefton, Juliet

**McCrackan, Jennifer (CalStateLA/National Park Service), Eric Weaver (National Park Service) and Steve Baumann (National Park Service)****[202]***Ice Cave Usage at El Malpais National Monument*

The lava tubes at El Malpais National Monument have had extensive anthropogenic usage throughout history. The primary focus of the caves has been the perennial ice contained within several of the park's caves. Recent paleoclimate studies indicate that the episodic usage of these caves has been related to extreme climatic events within the region and throughout the Southwest. While some of the caves have had unique usage, the pottery found in these caves suggests that the primary reason for visitation was to supplement water supplies during extreme drought conditions.

**McCray, Brian (Vanderbilt University)****[84]***Unstable Boundaries: The Archaeology of Centripetal Events in a Montaña Borderland*

This paper evaluates an ecologically intermediate zone along the eastern Andean slopes during the Late Intermediate period and Late Horizon (ca. AD 1000–1500) to investigate the way local groups negotiated interregional relations. The borderlands of the selva alta, or montaña, was an important area for two types of interaction: direct cultivation of lowland plants by people who still participated in the highland Andean system/sphere, and trade and interaction with groups who permanently lived outside that highland system. Inka administrators determined that highland peoples gave way to selva groups at the transition between the Huayabamba and Moyobamba valleys. This is the boundary between the province of Chachapoyas, in Chinchaysuyu, and the province of Muyupampa, in Antisuyu. I argue that centripetal events—feasts and religious rituals—were especially important for maintaining social group boundaries in a landscape where social bonds of land tenure and kinship changed due to distance and ecology. Centripetal events involved ceramics associated with western neighbors and personal adornments that were valued in both the highland and lowland idiom. The paper demonstrates how social lives/religious practices were shaped by neighbors, and how local advantages—control over lowland crops and travel—allowed inhabitants of this area significant autonomy.

McCouston, Ashley [190] see Means, Bernard

McCullough, Robert [15] see Pauketat, Timothy

**McDaid, Christopher (US Air Force, Fort Eustis, VA)****[127]***The Problem Has Been Identified: What's Next?*

The Fort Eustis Cultural Resources Management Program has monitored the installation's 234 archaeological since 2010. We have determined that the largest threat to the installation's archaeological resources is increased tidal erosion driven by climate change. It is time to move beyond documenting the extent of the problem and determine how to address the issue. Effectively accomplishing that requires bringing a diverse group of individuals and organizations together to build a narrative that leads to consensus on the proper course of action. The installation receives its operating funds from the US Air Force, consults on a government-to-government basis with six federally recognized Native Tribes/Nations, and has legal requirements to consult with the Virginia Department of Historic Resources and the Advisory Council of Historic Preservation. Two local historical societies have also been identified as having interest in the archaeology on Fort Eustis. The installation operates within a compliance-based funding system that provides funds to ensure compliance with applicable laws and regulations. This framework provides limitations and opportunities. I will lay out how we will work within that framework, with the very different organizations to develop and execute a multi-year plan to address this pressing issue.

**McDonough, Katelyn (Texas A&M University) and Richard Rosencrance (University of Nevada, Reno)****[94]***Records of Younger Dryas Life at Connley Caves 4 and 5, Oregon*

Ongoing interdisciplinary research at the Connley Caves (35LK50) is illuminating new aspects of human life during the Pleistocene at a previously unattainable resolution. This poster presents the Younger Dryas cultural chronologies of Caves 4 and 5, which include stratified archaeological surfaces containing activity areas and combustion features with associated tools and food debris. Although less than 10 m apart, the materials preserved within these shelters demonstrate very different records of site use that include a possible sewing camp, plant and animal processing, and retooling activities. This evidence demonstrates the Connley Caves were a well-known, repeatedly used, and important locality to some of the earliest Indigenous groups who lived in Oregon. As such, the Connley Caves are providing unique insights into early life in the Americas.

**McFarland, Jeremy (University of Nevada Reno) and Marisol Cortes-Rincon (Humboldt State University)****[62]***Landscape Ecological Zone Classification Using Airborne Laser Scanning Data in Northwestern Belize*

Understanding human-environment interaction, landscape utilization, and where people choose to settle are some major questions in Maya archaeology. A lack of regional scale ecological zone mapping has been a disadvantage in answering these types of questions. Light Detection and Ranging (lidar) is a leading technique in collecting the most comprehensive and accurate data for measuring vegetation structure and classifying ecological zones on a regional scale. In 2016, a total of 274.6 km<sup>2</sup> of lidar was flown by the National Center for Airborne Laser Mapping (NCALM) for a consortium of archaeologists under the auspice of the Programme for Belize Archaeological Project (PfBAP), located in northwestern Belize. In this study, we classify ecological zones using derivative lidar-metrics as inputs for a Random Forest Classifier. An investigation of the different ecological zones in the study area will help answer questions on ancient settlement choices and how these different zones were exploited.

**McGaha, Autumn****[4]***Late Archaic Bison Hunters at Bonfire Shelter Val Verde County Texas*

The relationship between projectile point typology and social identity has long been of interest in hunter-gatherer archaeology. Bone Bed 3 from Bonfire Shelter provides an opportunity to explore issues of typological variation and social identity. This site contains multiple projectile point types in what appears to be a single kill and attempts to recognize both discrete social groups and communal hunting behavior in the archaeological record. Bonfire Shelter (41VV218) is located in the Lower Pecos Canyonlands of

Texas and contains deposits that range from the late Pleistocene to about 1400 years BP. Bone Bed 3 represents a bison hunting event dating to approximately 2500–3000 BP. In this paper, the lithic assemblage from Bone Bed 3 is reexamined and compared to other assemblages from contemporaneous sites to investigate how different tools, including the Castroville and Montell types, can help determine if multiple social groups cooperated in making the kill, or if a single group utilized multiple weapon types. The goals of this paper include clarifying the typology of the Bone Bed 3 assemblage, connecting the Late Archaic deposits of Bonfire shelter to the broader cultural landscape, and exploring cooperative hunting behavior among prehistoric groups in the Lower Pecos.

**McGehee, Kelly (University of Central Florida) and John Schultz (University of Central Florida)**

[93]

*Classifying Chopping/Hacking Sharp Force Trauma Characteristics on Bone Utilizing Multiple Weapons*

Sharp force trauma (SFT) injuries to bone are often described in both forensic and bioarchaeological contexts, and experimental research analyzing cut marks from bladed weapons has been conducted to more accurately evaluate SFT. However, these studies typically focus on trauma from cutting and stabbing weapons using small, bladed instruments. While there is limited research utilizing chopping/hacking instruments, the inadequacy in experimental standardization of these studies makes comparing the results very difficult. Therefore, the purpose of this research is to discuss the macroscopic recognition and differentiation of chopping/hacking sharp force characteristics to bone from a number of large, bladed weapons. This research also aims to develop a standardized protocol by combining the common attributes of previous chopping/hacking studies. The research involved manually inflicting cut marks on pig bones while evaluating several dependent variables: general class of chopping/hacking instruments (axe, hatchet, machete, and cleaver), bone types (ribs and long bones), and the state of specimen (fleshed and defleshed). Furthermore, while there is disagreement in the literature as to whether a macroscopic analysis of cut marks can be utilized to definitively discern blade type, cut marks were thoroughly analyzed for specific SFT macroscopic characteristics to determine if weapon class could be accurately distinguished.

**McGill, Dru (North Carolina State University)**

[58]

*Discussant*

**McGovern, Thomas, Aka Bendtsen (U Greenland), Kirstine Møller (Greenland National Museum and Archives), Cameron Turley (CUNY Graduate Center) and Christian Madsen (Greenland National Museum and Archives)**

[33]

*Climate Change and Collaborative Response in Greenland*

Climate change is happening most rapidly in the circumpolar north, and the threats to both heritage and the archaeological record are dire. In southwest Greenland, coastal erosion, rising sea levels, and soil warming is causing the rapid loss of middens with excellent organic preservation. This region is a core area of Norse eastern settlement, and contains a substantial number of Thule and historic and colonial period Inuit (Kalaallit) and mission sites. With support from NSF, an international project (Greenland, Denmark, Iceland, Norway, US, UK, Canada) begun in 2019 has worked to engage with local communities and institutions to develop a multistranded approach to developing respectful mutual communication among all collaborators as we work to record and rescue heritage. While COVID-19 has limited international participation in fieldwork, Greenlandic teams have been able to carry out fieldwork and experiment with innovative approaches to combining hands-on field school participation and formal and informal community interactions with digital media that will ultimately connect to the Bifrost digital environmental platform (<https://bifrostonline.org/about/>). This paper presents work in progress toward developing a shared response to climate threats to heritage in a rapidly changing arctic.

McGovern, Thomas [33] see Madsen, Christian

McGovern, Thomas [114] see Nielsen, Michael

McGrath, Krista [64] see Colonese, André Carlo

**McGuire, Randall (Binghamton University)**

[14]

*Lost in Space: The Greater Southwest, Oasis America, the Gran Chichimeca, and the Southwest/Northwest*

It matters how we define the space of archaeological study. Concepts such as the Greater Southwest, Oasis America, the Gran Chichimeca, and the Southwest/Northwest differently define the archaeological space of the southwest United States and of northwest Mexico. Each draws a different boundary in that space and posits different processes to account for cultural change. I propose that we need to rethink how we categorize this space in three ways. First, archaeologists need to replace hard bounded, timeless entities such as the Southwest and Mesoamerica with more dynamic and malleable spaces. Second, researchers need to transcend modern political boundaries that had no meaning for the aboriginal peoples of North America. And, finally we need to progress beyond a Pueblo centric study that relegates the rest of the region to peripheral status. Alternatively, we can ask how relations create spaces. That is, how do environmental, cultural, and economic relations create spaces that change through time and with shifts in the scale/scope of our investigations.

**McGuire, Randall (Binghamton University)**

[195]

*Discussant*

[14]

*Chair*

McInnes, Breanyn [115] see Deans, Benjamin

McKelway, Hank [24] see Wampler, Marc

McKenzie, Clinton [114] see Mauldin, Raymond

**McKenzie, Emily (University of Alabama), Katherine Chiou (University of Alabama), Madison Brake (University of Alabama), Lisa Brazelton (University of Alabama) and Caleb Ranum (University of Alabama)**  
[20]

*Out of the Frying Pan and into the Fire: Measuring the Effects of Charring on Chile Pepper (Capsicum spp.) Seed Morphology*  
The chile pepper (*Capsicum* spp.) has cemented its place among New World peoples in prehistory as a fixture in medicine, ritual, and cuisine. The timing and context of its domestication and spread throughout the precolumbian Americas, however, remains unclear. Previous work on the identification of chile pepper seeds to species-level resulted in the development of identification keys for the five domesticated *Capsicum* species (*C. annuum*, *C. baccatum*, *C. chinense*, *C. frutescens*, and *C. pubescens*). This work, however, was conducted on modern seeds preserved through desiccation. In order to understand the taphonomic impact of carbonization on chile pepper seed morphology, we measured the effects of charring under various experimental conditions on modern chile pepper seeds. Through our comparison of the uncharred and charred morphology of our specimens, we are able to determine how chile pepper seeds are affected by charring, contributing to ongoing efforts to track the adoption and movement of chile peppers in the ancient Americas through morphometric methods.

McKeown, Ashley [44] see Ahlman, Todd

McKeown, Ashley [166] see Bowden, Taylor

**McKillop, Heather (Louisiana State University), E. Cory Sills (University of Texas, Tyler), Mark Robinson (Exeter University), Bretton Somers (Gulf South Research Corp.) and Cher Foster (Louisiana State University)**  
[154]

*Classic Maya Selection of Mangrove Wood for Buildings at the Paynes Creek Salt Works, Belize*  
*Laguncularia racemosa* (white mangrove) and *Avicennia germinans* (black mangrove) were selected as building posts at the Paynes Creek Salt Works, Belize. The posts were preserved in red mangrove peat (*Rhizophora mangle*). Of 4,042 wooden building posts mapped at 70 sites, 77 were *L. racemosa* and 38 were *A. germinans*. The buildings were pole and thatch structures that included salt kitchens, residences, and other structures. They were constructed along the shore of the seasonally, hyper-saline waters of a large, saltwater system, Punta Ycacos Lagoon, as a response to the consumer demand for dietary salt and salted fish by the increasing population at inland communities. The salt kitchens were dedicated to boiling brine in pots over fires to produce loose salt or further fire-hardened to make salt cakes for trade. The salt making was carried out as surplus household production, with estimates of more salt produced than needed by the lagoon salt making families. The ancient landscape was a mangrove ecosystem, with red mangrove included as firewood but not for construction. We discuss the use of mangrove wood in different areas of the lagoon system, the sizes of posts, their use in different parts of buildings, and temporal changes in wood selection.

**McKnight, Matthew (Maryland Historical Trust)**

[161]

*Skipton on Cohogoronto: Remote Sensing at the Site of Thomas Cresap's Eighteenth-Century Dwelling in Allegany County, Maryland*

Colonel Thomas Cresap is one of the most important frontiersmen in Maryland and American history. He played a major role in land speculation in the Ohio Valley, blazed a settler's road across the Alleghenies, was heavily involved in the fur trade, and played host to General Edward Braddock, George Washington, and other important dignitaries from the English colonies of Virginia, Maryland, and Pennsylvania, as well as from numerous Indian Nations. In November of 2020, the Maryland Historical Trust working with the Western Maryland Chapter of the Archeological Society of Maryland carried out a tripartite geophysical remote sensing survey within the C&O Canal National Historical Park. The geophysical survey was conducted in a hayfield, which had produced mid to late eighteenth-century artifacts during limited survey work in 2009 and 2010. Magnetic susceptibility survey defined a roughly 1.5 acre area of anomalous soils consistent with intense anthropogenic activity. Fluxgate Gradiometer and Ground-penetrating radar survey of 1.1–1.3 acres within this area revealed the presence of discrete anomalies consistent with at least two structures, clusters of postmolds and potential palisades, trenches, pits, and expansive activity areas. The pattern of anomalies is remarkably congruent with historic descriptions of Thomas Cresap's fortified home of Skipton.

McLaren, Whitney [56] see Skinner, Dougless

**McLeester, Madeleine (Dartmouth College), Jesse Casana (Dartmouth College), Alison Anastasio (University of Chicago) and Pete Geraci (University of Wisconsin–Milwaukee)**  
[126]

*Perennial Places: Archaeological Approaches to Past Indigenous Agricultural Landscapes of Wisconsin*

Wisconsin has over 450 documented archaeological and historical Indigenous agricultural fields. Recorded primarily in the late nineteenth and early twentieth centuries, these archaeological features are comprised of a series of constructed earthen ridges and

small mounds. They are also among the rarest earthwork features in the Midwest, with less than 10% of field sites remaining today. This presentation describes our ongoing efforts to document and investigate raised garden bed features in the Midwest as well as demonstrate their enduring ecological impacts. Here, we present data from lidar surveys, contemporary vegetation surveys, and excavation of a garden bed first located in historical aerial imagery. Together, these data provide new details on the extent, configuration, construction, and long-term ecological impacts of garden spaces.

**McLeester, Madeleine (Dartmouth College)**

[126]

Chair

McLeester, Madeleine [160] see Alperstein, Jonathan

McLeester, Madeleine [126] see Casana, Jesse

McLeester, Madeleine [126] see Schurr, Mark

McLeester, Madeleine [164] see Wheeler, Joseph

**McLellan, Alec (University of Toronto) and Elizabeth Graham (University College London)**

[218]

*Lamanai through Time: Spatial and Temporal Dynamics of a Maya Center in Northern Belize*

Archaeologists have speculated on the developmental history of the Maya site of Lamanai, in northern Belize, since its initial excavations in the 1970s. Scholars have proposed a myriad of interpretations to explain the changing configuration of the settlement over its two millennia of occupation. These interpretations have led to disagreements over the character of the urban landscape at Lamanai (i.e., its residential patterns, occupation density, periods of florescence/decline, and transformations over time). New research in the civic-ceremonial center and the periphery of the site provides a clearer picture of the internal and regional developmental histories of the Maya in northern Belize. Using techniques from geographic information systems, spatial statistics, archaeological excavations, and settlement survey, this paper reconstructs the changing configuration of Lamanai from the Middle Preclassic period (ca. 1500 BC) to the colonial period (ca. AD 1600) of Maya history. Insights from the built environment indicate a complex and changing historical trajectory, with a varied response in the center and periphery to the climatic and social changes of the ninth and tenth centuries AD.

**McMahon, Todd (History Colorado, Office of the State Archaeologist)**

[170]

*A Pandemic Dilemma Met for Colorado's State-Approved Repositories: How Virtual Training/Gatherings Now Support and Enrich this State's Curation Program*

Colorado's dispersed network of state-approved repositories for state-associated archaeological artifacts is supported by a community of over 38 organizational practitioners. The Office of the State Archaeologist of Colorado serves as the central program administration for this community. The COVID-19 pandemic in the years 2020 and 2021 presented a unique challenge to the way in which this support could be provided. Through the development of unique online "Confabs," workshops, electronic newsletters, virtual internships, online materials and a virtual forum this community has continued to grow and develop. The program's long tradition of an annual in-person forum morphed into a virtual preservation grant workshop and a virtual repository tour. The support of this community is vital to the success of Colorado's State-Approved Museums and Curatorial Repositories program. For small museums holding these archaeological collections it creates a strong sense of community pride and provides the means to widen a region's history and boost local historical based tourism.

**McMichael, Crystal (University of Amsterdam), Dolores Piperno (Smithsonian Tropical Research Institute) and Nina Witteveen (University of Amsterdam)**

[151]

*Using Phytoliths to Explore the Human History of Amazonian Forests*

[WITHDRAWN]

**McNeil, Cameron (Lehman College, CUNY), Edy Barrios (CUDEP-USAC), Oswaldo Gómez Barrillas (IDAEH), Carolyn Freiwald (University of Mississippi) and Mauricio Díaz García (Graduate Center, CUNY)**

[53]

*Creating Powerful Places: Offerings from the Plaza of the Seven Temples and Temple V at Tikal, Guatemala*

In 2007, a complex series of dedicatory offerings were found in some of the platforms of the Plaza of the Seven Temples at Tikal. These excavations were conducted under the direction of Oswaldo Gómez. In this paper we explore the variety and richness of these caches, which were used to imbue the structures with power, and we hypothesize on the process of their creation. Furthermore, we compare them with other offerings previously excavated by projects at Tikal and with a very different cache from Temple V. One vessel in particular, from the Plaza of the Seven Temples, preserves iconography depicting conquered people and may be tied to historical events recorded at Tikal.

**McNeil, Cameron (Lehman College, CUNY)**

[53]

Chair

McNeil, Cameron [177] see Griffith, Cameron

**McPherron, Shannon (MPI), Vera Aldeias (ICArEHB—Interdisciplinary Center for Archaeology), Paul Goldberg (Boston University), Deborah Olszewski (University of Pennsylvania) and Dennis Sandgathe (Simon Fraser University)**

[60]

*An Excavation Methodology for the Archaeological Sciences: A Case Study in Neandertal Use of Fire*

Microarchaeological techniques, particularly biomarker and ancient DNA sampling from sediments, are placing increasing burdens on interpretations drawn from traditional archaeological excavation sampling techniques. The context and the purity (in terms of contaminants) of deposits and samples can be difficult to determine and to assure in normal field conditions. Here we present a methodology wherein relatively large blocks of sediment from Layer 8 of Pech de l'Azé IV (Dordogne, France) are transported to a nearby lab and excavated under controlled conditions using a purpose built vacuum system. The methodology results in complete recovery of all sediment and artifacts. The sediments are collected in sterilized vials, and the workflow is free of biochemical contaminants. All finds are recorded in the original site grid, and the spatial database is cloud hosted so that all specialists have immediate access to the original data. While the analyses of the initial samples are still underway, here we present this methodology in the context of a project to better understand Neandertal use of fire.

**Meacham, Samuel (CINDAQ), Julien Fortin (CINDAQ), Wetherbee Dorshow (Earth Analytic), Christophe Le Maillot (CINDAQ) and Fred Devos (CINDAQ)**

[221]

*From Underwater Cave Survey in Yucatán, Mexico, to Geographical Information System (GIS): Concrete Case Study and Replicable Workflow Linking Data Acquisition to Scientific Data Exploitation*

The underwater caves of the Yucatán Peninsula, Mexico, present a complex topography, with passages building extended networks accessible through karstic windows (cenotes). While the caves themselves feature invaluable data of scientific interest, including geological, hydrological, or biological properties, they also contain numerous objects of historical, cultural and/or paleontological significance: human/animal remains, ancient Maya artifacts, mines and traces of early human activities. Acquiring data regarding the topography and cave features to build models and connecting the embedded objects within requires the definition of an efficient, replicable workflow linking cave survey and additional data acquisition to a Geographical Information System (GIS). Our research introduces the general context of the fieldwork, including the exploration, surveying and/or cartography of 400+ km of underwater caves in the Ox-Bel-Ha system and beyond. This paper presents some of the objectives for scientific exploitation, especially the spatial mapping of the features pertaining to cave archaeology and geology. Data structures for field collection and integration into a GIS system are defined, and a workflow based around five main steps described: acquisition, import, pre-processing, processing, and publication. Finally, remaining challenges and opportunities for the tools and workflow are highlighted, opening up future developments and scale up the system's implementation.

Meacham, Samuel [221] see Nava, Alberto

Meacham, Samuel [221] see Reinhardt, Eduard

Meacham, Samuel [154] see Steele, Riley

**Means, Bernard (Virtual Curation Laboratory), Ashley McCuistion (Fairfield Foundation) and Mariana Zechini (Germannna Archaeology)**

[190]

*Can't Touch This: 3D Archaeology and Public Outreach during a Global Pandemic*

The Fairfield Foundation, Germanna Archaeology, and the Virtual Curation Laboratory at Virginia Commonwealth University (VCU) see archaeological education and public outreach as central to their missions. We are, of course, not alone in having such a focus. Throughout the first year of the continuing pandemic, traditional approaches such as in-person events or classroom visits were simply not possible and even after the first year, such efforts were impacted by the closure of schools, inadvisable or curtailed due to local restrictions. We discuss strategies we implemented and how these changed our approaches to public archaeology and archaeological education.

**Meanwell, Jennifer (MIT), Elizabeth Paris (University of Calgary) and Roberto López Bravo (Universidad de Ciencias y Artes de Chiapas)**

[199]

*Scientific Investigations of Greenstone Acquisition and Use in the Jovel Valley, Chiapas, Mexico*

Greenstone objects represented culturally significant items for wealth accumulation, adornment, and funerary ritual across Mesoamerica. Although greenstone objects are found at many sites, the sources of jadeite in Mesoamerica are limited. Other green-hued stones, including serpentinite, micas, quartz, and antigorite were commonly used in addition to or instead of jadeite, and sources for these are more widely spread across the landscape, including the Chalchihuitán and Chenalhó sources utilized by modern craftspersons in Chiapas. In this paper, we present X-ray diffraction (XRD) and X-ray fluorescence (XRF) studies of greenstone axes, beads, and ornaments recovered from Late Classic to Early Postclassic sites in the Jovel Valley, Chiapas, Mexico. Most of the beads were recovered from a funerary cave located at Moxviquil, while miniature axes and other greenstone objects were recovered during excavations of residential areas. Our results suggest that many of the greenstone beads and axes at Moxviquil are jadeite; additionally, a variety of other greenstone minerals were used. Notably, the antigorite source at Chenalhó was not represented in the present sample. The results indicate that frontier areas such as the Jovel Valley were integrated into broader systems of value, exchange, and funerary practice among the prehispanic Maya.

**Meanwell, Jennifer (MIT)**

[199]

*Chair*

Medhat, AbdelRahman [106] see Silverstein, Jay

**Medina Martínez, Lorena**

[220]

*Contact Period Architecture in the Sixteenth-Century Capital of New Spain*

As archaeology analyzes and studies different aspects of change in our past, it also helps us understand the details of those changes using different approaches. Some of these fascinating aspects are those related to the contact period, encounters, and entanglement. Taking the above into account, I will approach the contact period from the archaeological and architectural remains of the sixteenth century in central Mexico. I will analyze how, after the invasion of the Spaniards in the former capital of Tenochtitlan, and its subsequent viceroyalty regime of New Spain, new constructions, architecture, transformation of the urban space, sacredness, and functionality, can be seen in the material culture. Therefore, I will explain how the architecture, techniques, and construction materials of the last years of Mexico Tenochtitlan blended with the first viceregal years, and how this yielded archaeological information about change, use and reuse of materiality, and ideology in the architectural sphere.

**Megan, Parker (University of Kentucky) and Geoffrey McCafferty**

[125]

*Paleoethnobotanical Insights into Postclassic Foodways in the Greater Nicoya Region of Nicaragua*

Two decades of archaeological investigations in Pacific Nicaragua have provided significant insights into Postclassic social dynamics in the Greater Nicoya culture area. In particular, these investigations have sought to examine the impact of successive waves of central Mexican migrants to the region. Culture contact studies frequently emphasize the role that foodways play in social and ethnic identity, as they are generally more resilient to broader cultural changes. This paper presents the results of paleoethnobotanical analyses of materials recovered from Postclassic domestic contexts at several sites in Pacific Nicaragua and examines the data within the broader context of central Mexican colonization. Doing so provides an opportunity to examine the ethnogenesis of local foodways and the possible introduction of central Mexican cultigens to the Greater Nicoya area. The results of these paleoethnobotanical studies will provide crucial insights into central Mexican influences on the foodways of the Isthmo-Colombian region.

Mehmetaj, Dukagjin [147] see Mehmetaj, Haxhi

**Mehmetaj, Haxhi (Archaeological Institute of Kosova), Dukagjin Mehmetaj (Archaeological Institute of Kosova), Sylvia Deskaj (University of Michigan), Apostolos Sarris (University of Cyprus) and Michael Galaty (University of Michigan)**

[147]

*Regional Archaeology in the Peja and Istog Districts of Kosova (RAPID-K): Survey and Settlement Patterns in Western Kosova*

In this paper we present the results of three seasons of survey in western Kosova, 2018–2019 and 2021. The primary research objective of RAPID-K (Regional Archaeology in the Peja and Istog Districts of Kosova) was to gain a better understanding of the diachronic material record of western Kosova, building on already existing knowledge of the archaeological record in the area. Over the years we have discovered 52 previously unknown sites in our study area. One of these sites is Pepaj, a large Bronze Age settlement discovered in 2018. Unlike most Bronze Age sites in the region, which are hill forts, it is situated on flat land. Another site, Lluga, which was discovered in 2019 seems to have been an important center for Neolithic stone tool production. Geophysics and controlled surface collection have been conducted at both sites, with encouraging results. Geophysics and surface collection were also applied this summer at three hillforts in the study area in order to learn more about their extent and chronology. In almost all cases, prominently at Lluga, the upper level of Syrigane and Lubozhde, magnetic measurements identified a number of structural remains in close correlation to the surface surveying results.

**Mehta, Jayur (Florida State University)**

[27]

*Ritual and Religion, Archaeology, and Enigmatic Material Culture from a Louisiana Sugar Plantation*

Oral tradition, historical memory, and testimony from descendant communities recounted the location of a church at Evergreen Plantation, a massive sugar-producing complex that relied on free and enslaved laborers to farm sugarcane, the crop that “changed the world.” At Evergreen, the enslaved, and later free people of color, were housed in 22 structures, 11 on either side of an oak allée. A map from 1880 confirms the location of 22 structures, but the church, would have been structure 23, and no known historical maps show such a building. This paper recounts the story of our search for this church and presents findings from excavations conducted in summer 2021. Enigmatic artifacts and compelling stories from community members are presented alongside a discussion of ritual architecture from the colonial and early American period in French Louisiana.

**Mehta, Jayur (Florida State University)**

[27]

*Chair*

Mehta, Jayur [46] see Hollingshead, Analise

**Meierhoff, James (University of Illinois at Chicago) and Artur Stasiak****[182]***Archaeology of the World War II German Prisoner of War Branch Camps of Chicago*

The Second World War came to the American home front in the form of hundreds of thousands of German prisoners of war. The captured combatants were initially housed en masse at large base camps, but many smaller branch camps were established in the American hinterlands to put the prisoners to work in local industries. While a largely forgotten aspect of the war, the nature of this labor put prisoners from these branch camps into close contact with American citizens and their communities, while simultaneously generating large sums of revenue for the US Army. In the Chicago suburbs, German prisoners were installed within repurposed Civilian Conservation Corps facilities to fulfill the need for wartime labor. Today, three Chicago branch camps are archaeologically preserved within the boundaries of the Forest Preserves of Cook County. This presentation discusses the archaeological research investigating the transformation of these spaces from footprints of Roosevelt's New Deal social programs into places of incarceration. The recent analysis of a copious early mid-century ceramic midden informs on the provisioning of such camps, while the identification of the POW enclosure at the large Skokie Valley camp shows parallels of segregation and exclusion also seen during the era of the CCC.

**Meinecke, Helena, Diana Recio (Instituto Nacional de Antropología e Historia), Abiud Pizá (Instituto Nacional de Antropología e Historia), Germán Yáñez (Instituto Nacional de Antropología e Historia) and Gabriel León (Instituto Nacional de Antropología e Historia)****[221]***Underwater Cultural Heritage in the Karst Systems of the Yucatán Peninsula: The Role of the Atlas of Caves and Cenotes, SAS-INAH*

The karst systems of the Yucatán Peninsula—consisting of flooded or semi-flooded caves, cenotes, and rejoyadas—contain rich and diverse paleontological, archaeological, and historical deposits. Together with coastal and marine sites, they constitute the Underwater Cultural Heritage of Mexico. The physical-chemical conditions of many of the caves and cenotes have promoted the preservation of this heritage, with the integrity of many sites largely unaltered for thousands of years. Over the past two decades, over 100 sites within the continental waters of the Yucatán Peninsula have been identified and documented for the purpose of facilitating research and ensuring the protection and conservation of these at-risk submerged sites. These efforts have culminated in the Underwater Archaeological Atlas Project, coordinated and conducted by the Vice Directorate of Underwater Archaeology (SAS) of Mexico's National Institute of Anthropology and History (INAH).

Meinekat, Sarah [92] see Milton, Emily

**Meissner, Nathan (Centre College)****[53]***The Burial-Cache Continuum Revisited: Biface Ritual Deposits at the Plaza of The Seven Temples, Tikal*

Archaeological research at the Plaza of the Seven Temples at Tikal, Guatemala, has contributed significant insight into political and ritual complexes during the Early to Late Classic periods (AD 250–850). This paper examines the relationship of lithics, social space, and ritual offerings by highlighting a technological systems perspective of bifaces originating from caches discovered at three temples at the plaza. This paper reveals how bifaces of low production quality were used in cist offerings and surrounded by a variety of important offerings. Their fragmentary state suggests their prior social use-life was important enough to be included with such lavish goods. Such perspectives illuminate the domains of production activities, artifact properties, and use activities as they relate to Maya object biographies, architectural termination, and the control of distant cosmological power.

Meizis, Marie [164] see Fitts, Lauren

Mejía, Juliana [155] see Bongers, Jacob

**Mejía Ramón, Andrés (Okinawa Institute of Science and Technology)****[78]***The Mechanics of Landscape and Behavior: A Least-Cost Path Approach Grounded in Mechanical Physics*

Least-cost path analyses are commonplace in GIScience as applied to archaeology. However, short of applying various different proposed cost functions to quantify movement costs across the landscape with often questionable results, a coherent, comprehensive analytical framework has yet to emerge. In this paper, I provide a critique of the approach as applied in archaeology based on its inconsistencies with how the physical phenomena are modeled mathematically. I develop an energetically geared least-cost path analysis that is both rooted in fundamental principles of physics and kinematics and avoids making determinative statements about which routes will be taken. This approach quantifies costs not only in terms of least-time, but also least-energetic work, least-net metabolic energy, and least-effort. I demonstrate the archaeological utility of modeling the mechanics of landscape and behavior by simulating possible routes and networks between major centers in Ancient Mesoamerica across different types of terrain. I finally extend this approach to the paths taken by farmers and their fields as a way of estimating demographic capacity.

**Melby, Autumn****[82]***Outside Looking In: Everyday Life and the Negotiation of Collapse for Rural Peoples*

Collapse, as a sociopolitical process, has most often been interpreted through the lens of urban life and the decentralization of elite networks. While numerous studies have emphasized the role of power relations and hegemony to explain the persistence or alteration of specific practices, fewer have considered how the social experience of living rurally may foster diverse outcomes, notions of identity, and everyday traditions. Everyday differences between rural and urban settings may become more distinguishable in distinct moments of societal change, such as the collapse of political institutions. Drawing from archaeological research on rurality, particularly as applied in Maya and Andean studies, this paper proposes how a framework centered in rurality may be applied to the study of Native American Mississippian period chiefdoms, from their rule to their disintegration. Specifically, I examine how rural peoples in the American Bottom floodplain responded to the collapse of the Cahokia site. By foregrounding the significance of dynamic rural peoples and the ephemeral traces of everyday life that are often overlooked, archaeologists may expand our theoretical models of cultural change and form a more nuanced and comprehensive understanding of collapse that allows for multiple trajectories of alteration, persistence, and presence.

**Melgar, Emiliano (Museo del Templo Mayor-INAH)****[14]***Tracking the Manufacturing Traces of the Turquoise Objects from Mesoamerica, Northern Mexico, and the American Southwest: A Technological Perspective*

There are thousands of turquoise objects found in different sites of Mesoamerica, Northern Mexico, and the American Southwest. Unfortunately, most of the researches about them had been focused on the symbolic meaning, its morphology, trade, and use, but very few study their manufacturing traces and the organization of their production. In this paper, I will present a technological perspective to analyze and characterize their manufacturing marks through the employment of experimental archaeology and scanning electron microscopy (SEM). The comparison of the turquoise assemblages from more than 50 sites located in these regions showed specific patterns related with lapidary traditions and technological styles. Interestingly, the manufacturing traces of only one tool predominate in the majority of objects beyond each region: the well-known sandstone lapidary abrader, an uncommon specialized tool in Mesoamerican sites. With this new info, it is possible to track the manufacturing techniques in order to appreciate new nodes of interactions and trends of circulation of the turquoise pieces (raw materials, blanks, and finished objects) among the sourcing areas, the workshops, and the final consumers.

**Melton, Mallory (University of California Santa Barbara)****[100]***Discussant***Menaker, Alexander (University of Texas–Austin)****[224]***An Interloping Inka in the Valley of Volcanoes, Southern Peruvian Andes*

Through archaeological, historical, and ethnographic research, this paper explores Inka state (AD 1400–1532) strategies and effects in the Andagua Valley, also known as the Valley of Volcanoes, in the Southern Peruvian Andes. The Andagua Valley is a dynamic landscape composed of lava flows, volcanoes and anthropogenic features (terraces and canals) shaped by long-term human habitation that were subject to Inka and Spanish imperial reigns prior to the contemporary Peruvian state. The highland valley sits nestled among the major valleys of the Colca, Cotahuasi and Majes, and comprised the southwest sector of the Inka Empire, Condesuyos, one of the four regions of Tawantinsuyu. Research in Andagua, including the first systematic archaeological survey and excavations, yields insight into provincial Inka relations with local populations and the landscape. Presenting foundational evidence including settlement pattern data, information on architectural styles, infrastructure, ceramics and lithics as well as oral histories and toponyms, this paper demonstrates how the Inka sought to incorporate the local landscape by transforming ritual features and expanding and constructing new settlements. The Valley of Volcanoes presented a novel landscape to the Inka, with the tensions of empire and colonial encounters manifest in social memories and the material landscape.

**Mendenhall, Phillip****[82]***Phylogenetic Modeling Applications for Community Level Interaction and Resilience: Using Socially Learnable and Material Preference Factors (Traits) with Upper Ohio Valley Middle Woodland Extant Ceramic Assemblages*

Novel applications of phylogenetic quantitative analytical methods have been applied to evaluate change within and between supra-local communities through the analysis of regional Middle Woodland ceramic assemblages from the Upper Ohio Valley. Combined spatial and temporal variables including artifact morphological traits (i.e., form, decoration, temper), heritable cultural techniques (i.e., firing method, throwing technique), source material properties, and their variation at the local, community, and supra-local community level are used to trace intra-community interaction and the process by which learned traits and morphological preferences are transmitted in the archaeological record. This process uses cultural phylogenetic neighbor-net modeling techniques to identify material preference and learned traits, which are evaluated in conjunction with geographic variation and the temporal reticulation of these processes. Preliminary results have shown innovations pertaining to how individual communities exchange manufacturing techniques and cognitive preferences related to vessel form. This method, combined with single-specimen type selection (Chronotype sampling strategy) can be used to quickly evaluate large regional extant assemblages efficiently, with varying levels of documentation, thereby providing regional-level survey returns from underutilized museum collections.

**Mendoza, Rubén (CSU Monterey Bay)****[103]***The War of Heaven: A Reappraisal of the Aztec Sun Stone in Light of the New Fire Ceremony of AD 1507*

The Aztec Sun Stone incorporates multidimensional characteristics that have vexed scholars for generations. The ambiguity inherent in the multitude of androgynous identities and conflicting astronomical and calendrical iconographies represented has prompted divergent interpretations of the monument since its discovery in AD 1790. Predicated on calendrical and iconographic correlations between the Sun Stone and select period Nahua monuments and codices, this study finds that the entire semasiographic system of the Sun Stone affirms its role in the commemoration of the last New Fire Ceremony celebrated in Mexico Tenochtitlan in AD 1507. The Sun Stone thereby represents the rebirth of “Sol Nueve” on the occasion of the New Fire Ceremony, thereby dating the monument to the year 2 Acatl (AD 1507). The Sun Stone thereby exalts the rebirth and perilous transit of the “Ninth” or “Night Sun” (Yohualtecuhtli) on the occasion of the New Fire Ceremony, and heralds the reigning sovereign Moteuczoma Xocoyotzin (AD 1502–1520) in his guise as the form-changing sorcerer-like personification of the “Night” or “Ninth” (Reigning) Sun or sovereign of the Mexica Empire in that perilous and apocalyptic time and place.

Menéndez, Lumila [157] see Barberena, Ramiro

**Mentzer, Susan (Senckenberg, Univ. of Tuebingen), Britt Starkovich (Senckenberg, Univ. of Tuebingen), Mara Lou Schumacher (Newcastle University), Alex Bertacchi (Yale University) and Nicholas Conard (University of Tuebingen)****[16]***A Field-based Analysis of Bone Burning and Diagenesis at Sibhudu Cave, South Africa*

Sibhudu Cave contains Middle Stone Age archaeological deposits with highly fragmented fauna, abundant evidence for burning, and spatially constrained phosphatic diagenesis. This study aimed to determine the impacts of heating and postdepositional alteration on the bone assemblage. In our field laboratory, we systematically analyzed 800 small, unidentifiable bone fragments from seven layers. We evaluated color using Stiner’s burn codes and used a portable Fourier transform infrared spectrometer to look for molecular markers that indicate burning. The results show that several of the indices used together to identify heated bones are unreliable at Sibhudu due to diagenesis. Many of the bones yield crystallinity indices that fall outside of the range documented from experimental burning, while values for three additional indices are more uniform than would be expected. Only the presence / absence of infrared peaks at 1,088 and 630 cm<sup>-1</sup> appear to be reliable indicators of burning at this site. In addition, 23% of the bones ranked with Burn Code 6 (calcined) lacked the peak at 630 cm<sup>-1</sup> that indicates burning to high temperatures. We speculate that since other odd colors are observed (e.g., blue, orange) there may be an additional taphonomic process that contributes to white bone color at Sibhudu.

Mentzer, Susan [16] see Abell, Jordan

Mentzer, Susan [16] see Starkovich, Britt

**Menzer, Jeremy (University of Arkansas)****[137]***Moderator***Meraz Munguia, Miriam (Autonomous University of Baja California Sur), Gerardo Gonzalez Barba (Autonomous University of Baja California Sur), Fabiola Guzman Camacho (National Institute of Anthropology and History) and Alfonso Rosales Lopez (National Institute of Anthropology and History)****[63]***Determination of the Archaeoichthyofauna and Inferences of Their Use in Ensenada de Muertos, Mexico*

The ancient inhabitants of Ensenada de Muertos made use of fish, mainly as a food source, between 5,500 and 3,000 years before present. In one of the 11 excavations carried out in the dune area of the Ensenada de Muertos, faunal elements were found that allowed us to consider the site as a shell midden and an area of funerary burials. Taphonomically, more than 90% of the remains show a certain degree of calcination, and some show biochemical corrosion and calcium carbonate encrustation. Identified fish remains include 14 families of fish of reef, coastal and oceanic habitats. The highest indices of dominance and constancy obtained were those of black skipjack (*Euthynnus lineatus*) and parrotfish (*Scarus* sp.). Through mathematical models and the measurements of osteological remains, sizes of the most frequent organisms at the site were estimated. Ancient inhabitants used the site temporarily during warm periods and the fishing methods they used were not selective.

**Mercier, Norbert (Université Bordeaux-Montaigne), Christophe Falgueres (MNHN, France), Yossi Zaidner (Hebrew University of Jerusalem, Israel) and Israel Hershkovitz (Tel Aviv University, Israel)****[191]***Chronology of the Paleolithic Site of Neshar Ramla (Israel) Based on Radiometric Methods, Part 1*

Dating methods are of paramount importance to constrain the chronological framework in which past humans evolved. In the case of Neshar Ramla, four radiometric methods were applied to different materials for establishing a reliable framework. Here we present the first series of results already published (Zaidner et al. 2021) obtained on teeth using the ESR/U-series dating method, and on sediments and burnt flints using luminescence methods. The dated anthropic remains were recovered from the lower part of the stratigraphy, in layers V and VI, and allowed us to propose an age of 120–140 ka for the Middle Pleistocene *Homo* of Neshar Ramla. For each dating method and its associated material, we discuss its strengths and weaknesses.

Mercier, Norbert [191] see Falgueres, Christophe

Merlo, Stefania [186] see Horn, Maryke

**Mesia-Montenegro, Christian (Universidad Privada San Juan Bautista) and Angel Sanchez-Borjas (Pontificia Universidad Católica del Perú)**

[74]

*Macabalaca: New Evidence for the Kotosh Religious Tradition in the Huarmey Valley, Peru*

Rescue excavations at the site of the site Macabalaca (PV35–72), in the Huarmey Valley, have identified a rectangular structure with niches on its walls and a floor with a central hearth. We present the results of those excavations, emphasizing its stratigraphic components and relative chronology. We conclude that the identified structure belongs to the Kotosh Religious Tradition (KRT) and can be preliminary placed at the Late Archaic (2800–1800 BC) or Early Formative periods (1800–1200 BC).

**Messinger, Emma (University of Pittsburgh)**

[96]

*From Corn to Cacao: Building a Database for Exploring Human-Plant Interactions in the Maya Lowlands*

Archaeologists are interested in the ways people coevolved with and adapted to their environments in the past, and human-plant interactions were central to these developments. In the Maya lowlands, plants influenced complex social processes including sedentism, the origins of inequality, and the resilience and collapse of societies. While paleoethnobotanical studies are infrequently included in archaeological research strategies, due in large part to poor organic preservation in the humid tropics, there is a wealth of data about ancient Maya human-plant interactions from other sources. This project addresses the paleoethnobotanical gap through the creation of a reference database of wild and domesticated plant usage from published paleoethnobotanical studies, iconographic and epigraphic datasets, codices, and other ethnohistorical sources. The database can be a resource for future research design while helping to generate diachronic questions on the resilience of Maya society throughout periods of social, political, and environmental change.

Mesterházy, Gábor [2] see Riebe, Danielle

**Meyer, Carol (U Warsaw)**

[132]

*Glass from Serra East, Sudan*

During the construction of the Aswan High Dam many archaeological salvage projects were undertaken upstream, including the Nubian Expedition of the Oriental Institute of the University of Chicago. The expedition recovered a small but useful glass corpus from Serra East (Cerro Mato) near the Second Cataract of the Nile in Sudan. The glass dates to the Sudanese Christian period, the twelfth through fourteenth centuries, or the early Mamluk period in Egypt and Syria. Some of the pieces may have been produced locally from recycled glass, an activity not well attested in Sudan. Other, fancier vessels have parallels on the Red Sea and East African coasts and north into the Syro-Palestinian region as far as Damascus. They are evidence for a persistent supply of foreign sumptuary goods across a sometimes acrimonious border.

**Meyer, Jana (University of New Mexico)**

[173]

*The Spatial Distribution of Jewelry at Tijeras Pueblo*

Tijeras Pueblo is a fourteenth-century Puebloan village in New Mexico. In the 1970s, more than 400 jewelry pieces were excavated at the site. Jewelry can serve as markers of wealth and cultural identity on several social levels. Therefore, the distribution of jewelry in general and of specific jewelry types is likely to be culturally significant and archaeologically informative on the social structure of a community. Using geographic information systems (GIS), I analyze the spatial distribution of jewelry at Tijeras Pueblo based on shape, material, and production stage employing optimized hot spot analysis. Spatial and artifact data are drawn from archival files and publications. This study addresses two research questions: (1) Is jewelry distributed equally (dispersed or random pattern) or unequally (clustered)? (2) What does the jewelry distribution suggest about access to wealth, or about jewelry craft production? Results show no clustering of blanks/raw materials, thus evidence for jewelry workshops is lacking. There is a clustered distribution of jewelry with a significant hot spot in the northwest portion of the main mound close to a kiva. However, jewelry from rare materials is not clustered. Therefore, the cluster is likely linked to kiva-specific activities, rather than indicating unequal access to wealth.

**Meyer, Kelton (Colorado State University)**

[97]

*Reddin Redux: Looking Back at Folsom-age Settlement of the Northern San Luis Valley, Colorado*

The Reddin Folsom site (5SH77) is a well-known but underreported Paleoindian surface scatter strewn over 300,000 m<sup>2</sup> at center of the Closed Basin, a prominent hydrologic feature of the northern San Luis Valley, Colorado. Surveys and test excavations by the Smithsonian Institution and University of Wyoming (1979–1983) revealed at least three widespread concentrations of broken Folsom weaponry and production debris, suggesting either aggregation or repetitious use of the landscape for hunting, camping, and retooling activities. Folsom flintknappers at Reddin relied on a diverse suite of lithic raw materials procured from outcrops of high-quality jaspers, quartzites, petrified woods, and volcanic rocks (obsidian and dacite) available in the interior ranges of the Southern Rockies and Southwest regions. This paper introduces a new PhD dissertation project which aims to clarify aspects of the

Folsom occupation(s) at Reddin based on a formal analysis of the collections, as well as new fieldwork utilizing high-resolution survey and testing strategies.

Meyer, Kelton [51] see LaBelle, Jason

**Meyer, Michael, Mark Aldenderfer (University of Merced), Luke Gliganic (University of Wollongong), Jan-Hendrik May (University of Melbourne) and Zhijun Wang (Chinese Academy of Geological Sciences, Guilin)**  
[10]

*Illuminating Tibet's Past Using Novel Luminescence Techniques*

The peopling of the Tibetan plateau has raised significant scientific interest. Research still revolves around key questions such as when, why and via which route humans initially colonized the high-altitude core of central Asia. A major challenge in deciphering the tempo and mode of human migration, occupation, and eventual anthropogenic alteration of the Tibetan plateau and its high-altitude arid environment is the dearth of stratified archaeological sites. Nevertheless, the Tibetan highland does preserve traces of human presence, e.g., in the form of lithic surface artifacts. Witnesses of human presence are also often associated with hydrothermal springs that are a common phenomenon on the plateau, where they are bound to tectonic faults. In this talk we shed light on both types of deposits and associated archaeological sites, i.e., hot spring carbonates that carry human imprints and lithic surface scatter sites. Optically stimulated luminescence (OSL) dating techniques are used to constrain their depositional age: OSL sediment burial dating and OSL rock surface dating. We report the first application of OSL rock surface dating to lithic surface artifacts and the far-reaching potential this novel technique can have also beyond the highlands of Tibet.

**Meyer, Will (Mercyhurst University)**

[165]

*Moderator*

**Meyers, Maureen (New South Associates Inc.)**

[12]

*Evidence of Absence: A Brief History of Exclusivity in Archaeology*

This paper provides a historical context for how the discipline of archaeology has excluded various groups of people and examines the cost of that exclusion. These excluded groups include women, Black, Indigenous, and People of Color, differently abled individuals, members of the LGBTQ community, and those excluded because of economic constraints. This history of exclusivity is as old as the discipline itself, and it has come at a high price. Exclusivity is often recorded in curated collections, citations, and understudied collections. I present this history, discuss alternate ways of examining the past and the present, and suggest new ways to move forward. By critically examining the discipline today, including its theories and methods, we can identify what we have lost and create a more inclusive archaeology.

**Meyers, Maureen (New South Associates, Inc.)**

[100]

*Discussant*

[12]

*Chair*

Meyers, Stephanie [48] see Lentz, David

Michel López, Marcos [124] see Calla Maldonado, Sergio

**Micheletti, George (University of Central Florida), Shane Montgomery (University of Calgary), Holley Moyes (University of California, Merced) and Terry Powis (Kennesaw State University)**

[54]

*Identification of Potential Inequalities among the Classic Maya at Las Cuevas and Pacbitun, Belize*

To understand the development of wealth inequalities in Classic (250–900 CE) Maya society, it will be important to evaluate how the disparity of status and wealth within and between polities are influenced by variables of time and space. Within the past decade, lidar technology has allowed archaeologists to document household settlement on local and subregional levels providing alternative modes for calculating metrics of wealth. Combined with traditional pedestrian survey, we have begun to amass substantial data on variation within household groups, disparities which may indicate inequality within these communities. Here, we utilize settlement data generated from the sites of Las Cuevas and Pacbitun to qualify residential variation through Gini coefficients and Lorenz curves. Special attention is given to areal and volumetric deviation within identified households in both study regions. Based on previous research, we understand that Pacbitun and Las Cuevas underwent divergent trajectories in terms of initial foundation and length of occupation. We hypothesize that these factors will influence the range of inequality present within residential groups, with higher differentials observed in the more developed archaeological landscape surrounding Pacbitun. Identification of these disparities will aid in the overall understanding of wealth differential within ancient Maya households throughout the Lowlands.

Micheletti, George [18] see King, Adam

Micheletti, George [153] see Powis, Terry

**Mika, Anna (Kent State University), Briggs Buchanan (University of Tulsa), Alastair Key (University of Cambridge), Michelle Bebber (Kent State University) and Metin Eren (Kent State University)**  
[20]

*An Experimental Assessment of Clovis Knife Cutting Efficiency*

This study presents the results of an experimental assessment of Clovis knife use. In this experiment we used seven replica Clovis point forms, representing the average and extremes of observed Clovis form, in two cutting tasks: rope cutting and clay cutting. Statistical comparison of cutting time, our measure of cutting efficiency, indicated differences among the knife forms in both tasks. These results, when considered with previous penetration and durability studies, are largely consistent with the hypothesis that the selection of functional attributes contributed to Clovis point evolution across North America. We also show that better knives serve as poorer points, and vice versa, but better knives are more durable than poorer knives. We conclude with our results' further implications for Clovis knife use and allometry.

**Mikeska, Christine (University of North Carolina, Chapel Hill)**

[23]

*Herding in Hattuša? Urban Animal Economy in the Northern Lower Town of LBA Boğazköy-Hattuša*

The ancient city of Hattuša was one of the largest and most powerful cities of LBA Southwest Asia. This expansive urban center covered approximately 200 ha and housed a large, socially diverse population, who required huge quantities of provisions to sustain themselves and the institutions they represented. While the landscape surrounding Hattuša was not conducive to large-scale grain agriculture of the variety practiced in Mesopotamia, ethnohistorical sources indicate that the surrounding Anatolian plateau was suited to intensive pastoralism. Additionally, natural springs within the city itself provided both the city's inhabitants and their livestock with a consistent, year-round water supply. While these factors suggest that Hattuša was uniquely suited to highly specialized, and potentially localized, animal management strategies, minimal scholarly attention has been paid to the city's animal economies and the networks that organized them. As part of a larger project that combines zooarchaeological, isotope, and historical analyses, this poster presentation provides a preliminary look at urban animal economy in Hattuša's Northern Lower Town by examining species, age-at-death, and pathology profiles. These data provide a preliminary look at animal management decisions and the impact of those decisions on livestock health at LBA Hattuša.

Milburn, Zoe [114] see Minette, Elizabeth

Milella, Marco [155] see Schotsmans, Eline

**Miller, Bryan (University of Michigan) and Alicia Ventresca Miller**

[99]

*Central Places in the Mongol Empire*

In the struggle to understand cities of the Mongol Empire, we must first recognize the apparent lack of perceived differences between itinerant camps (ordo) and "urban" centers among steppe communities as well as non-steppe visitors. Mongol-era witnesses compared camps to cities, describing even the capital at Karakorum as a camp with walls and permanent structures. In addition to such cities, remnants of walled compounds, stelae and statues, and cemeteries all indicate elite investments at central locales in the steppe. In order to move beyond the constraints of urbanism models, we employ a revised concept of "central places" to investigate fixed places in the landscape where Mongol elite households, herds, and constituents converged and dispersed. Combining textual and material evidence, we aim to postulate the range of activities at such central places, and to move toward a more nuanced understanding of Mongol itinerancy and landscapes.

**Miller, D. Shane (Mississippi State University), Derek Anderson (Mississippi State University), James Strawn (University of Georgia) and Robert Barlow (University of Wyoming)**

[97]

*The Curious Case of Early Holocene Jude Points, or Were There Plains Interlopers in the Tombigbee River Valley, Mississippi?*

In the American Southeast, there are only a limited number of securely dated sites from the Late Pleistocene and Early Holocene, and type descriptions are often cobbled together across subregional projectile point guides. Many of these projectile point types are poorly defined and lack any kind of chronological underpinning. One such type, the Jude, has a limited distribution in northeastern Mississippi, but has recently been recovered from dated, Early Holocene context at the Hester site in Amory, Mississippi. Here, we argue that this type may be the edge of larger interaction network between the eastern periphery of the Plains and the Black Prairie of the Tombigbee River Valley.

Miller, D. Shane [117] see Barlow, Robert

Miller, D. Shane [117] see Strawn, James

**Miller, Davin (Purdue University), Erik Otárola-Castillo (Purdue University) and Gabriela De La Puente-León (Purdue University)**

[40]

*Modeling Early Human Migration Patterns in South America: Merging Bayesian Spatial Analyses and Agent-Based Modeling along the Peruvian Coastline*

The routes by which some of the first South Americans traveled remain a fundamental question in the study of settlement patterns and human colonization worldwide. However, in South America these early migrations occurred along coastlines now mostly

submerged. In countries like Peru coastal archaeological sites dating to this time are not abundant. Our previous Machine Learning spatial analyses focused on quantifying evidence of early human migration and their association with relevant environmental and landscape variables. Their objective was to provide probabilities across space to locate early archaeological remains in this area of the Andes, especially in the Cañete Province, along the central Peruvian coast. In this presentation we use those results and merge them into an Agent Based Model (ABM). ABMs are designed to model greater nuances in the dynamics between variables such as early migrant populations and their environment (e.g., emergent properties). We constructed our ABM in the R programming environment to generate probabilistic predictions of new site locations. Results of cross-validation tests show that our ABM makes successful predictions of known sites using independent datasets. In addition, planned future fieldwork (pedestrian surveys) will verify empirically the potential of these site probabilities once field activity can resume safely.

**Miller, G. Logan (Illinois State University), Kenneth Farnsworth (Illinois State Archaeological Survey) and Brad Koldehoff (Illinois Department of Transportation)**

[119]

*Use-Wear Evidence for Bead Production at the Middle Woodland Period Crane Site, Greene County, Illinois*

Lithic use-wear analysis of chipped stone blades and drills from the Middle Woodland period Crane site in Illinois offers a view into pearl/shell bead production. Crane is a Middle Woodland residential site located in the Macoupin Creek Valley. Investigations in the 1970s identified numerous Middle Woodland artifacts and features, including evidence of a domestic structure. Over 1,500 chipped stone blades, many of which were retouched into drills, were recovered during these investigations. Microscopic use-wear analysis of 75 drills and 222 blades indicate an emphasis on pearl/shell bead manufacturing at the site. Tens of thousands of pearl/shell beads have been recovered from Middle Woodland mounds across the Eastern Woodlands yet no site contained evidence for the intensive manufacture of pearl/shell beads until now. These beads had social, economic, and spiritual value for indigenous groups participating in the Hopewell Interaction Spheres. Pearl/shell bead production at Crane is exceptional not only for the scale of production but for the occurrence in a domestic context away from mound sites where beads are almost exclusively deposited. This illustrates connections between mounds, mussels, and people throughout the landscape.

**Miller, Mary**

[128]

*Maya Jades in the US Museum*

No material of ancient Mesoamerica is more identified with Karl Taube than jade: he has studied and analyzed source material, trade, meaning, and technique of production, in all periods and places of Mesoamerica. In this consideration of Maya jades, the identification of carved Maya jades as requisite to the art museum collection in the United States will be of particular concern, with attention to practices of the 1940s and 1950s. Collections in the Yale University Art Gallery, Metropolitan Museum, Houston Museums of Fine Arts and Natural History, and Cleveland Museum of Art will be considered, in light of archaeologically recovered jades from Chichen Itza, Toniná, and Nebaj.

**Miller, Melanie (University of Otago, New Zealand), Siân Halcrow (University of Otago, New Zealand), Yu Dong (Shandong University, China), Kate Pechenkina (Queens College CUNY) and Wenquan Fan (Henan Provincial Institute of Cultural Relics and Archaeology)**

[193]

*Caretakers as Creators: Gendering Children through Diet in Ancient China*

Food is a key substance that humans use in socializing ourselves—it is a biological imperative that we eat, but what we choose to eat is laden with cultural meanings and can be tied to identities. Children often have little power in subsistence decisions, with caretakers providing the foods needed to survive and thrive. Previous research on ancient China has documented increasing inequality and notable dietary differences between males and females. Using stable isotope analysis of incremental dentin samples we reconstruct the childhood diets of 57 Eastern Zhou period individuals from the Central Plains region of China (771–221 BCE). From early life, male children typically showed higher  $\delta^{15}\text{N}$  values than females, and this continued across childhood. We interpret this as gendering behaviors embodied through the differential consumption of meat, with children perceived to be males given slightly more meat than children perceived as females. Further, it is possible mothers adjusted their diets while breastfeeding based on their beliefs about a child's sex and gender. It is through daily acts such as eating where gender is created and re-created over the lifetime, and the caregiver-child nexus is a fruitful locus to study gender and other identities in human history.

Miller, Melanie [193] see Wesp, Julie

**Miller, Myles, III (Versar)**

[86]

*Mountains, Caves, Storm Gods, Ancestors: The Deep Time Origins of Jornada-Mimbres Cosmologies*

The past decade of research into the sacred landscapes, iconography, material culture, and ethnographic record of the Jornada and Mimbres Mogollon regions has revealed a persistent theme related to mountains and caves. Mountains and caves had multivalent metaphorical and symbolic meanings relating to underworld, ancestors, emergence, water, clouds, and rain. Such expressions were the foundations of origin and emergence histories and politically legitimizing narratives among prehistoric and historic societies of the southern Southwest and Mesoamerica. It is proposed that members of Jornada and Mimbres communities viewed themselves as relationally constituted through such ideational landscapes and that such relationships were widely expressed in iconography and sacred landscape features, both natural and constructed. Chronometric dating of perishable items used in cave shrines or displaying iconographic expressions of religious entities and beliefs has established that some of the concepts underlying regional cosmologies were present as early as AD 600 or 700, indicating that these foundational cosmologies have significantly greater time depth than previously understood. This paper examines the material expressions of Jornada-Mimbres cosmologies, their deep time origins, and

the question of whether they originated in Mesoamerica or perhaps were an indigenous development that arose from a common pan-regional foundation.

Miller, Myles, III [118] see Graves, Timothy  
Miller, Myles, III [14] see Wright, Aaron

**Miller, Naomi (University of Pennsylvania Museum & ISAW)**

[126]

*Discussant*

**Miller, Sarah, Emily Jane Murray (Florida Public Archaeology Network), Emma Dietrich (Florida Public Archaeology Network) and Kassie Kemp (Florida Public Archaeology Network)**

[127]

*Novel Engagement Strategies to Cover a Spectrum of End Users: Five Years of Sharing Heritage Monitoring Scout (HMS Florida) Results with the Public*

The Florida Public Archaeology Network (FPAN) launched the Heritage Monitoring Scout (HMS Florida) program statewide at the first Tidally United Summit in 2016. Since that time, over 800 volunteers have signed up and submitted over 2,480 monitoring forms from across the state. FPAN staff recognize the importance of engaging the public on heritage at risk in a diversity of ways to reach the many members of the public we serve. One novel approach includes coastal walk focus groups, Conversations with the Community About Heritage at Risk (CCHAR), with set questions for cross comparison to engage community volunteers, and identify those responsible for future action. On the other end of the spectrum, FPAN uses photogrammetry, terrestrial laser scanning, and 3D printing to engage an altogether different audience on the same topic. This paper will share a range of novel communication strategies used by FPAN to encourage the public to join the conversation on heritage at risk over the last five years, as well as identify the new challenges we face in our next science collaborative project funded by NOAA starting in October 2021.

**Miller, Sarah**

[190]

*Discussant*

**Miller, Virginia (University of Illinois at Chicago)**

[55]

*Chair*

**Miller Wolf, Katherine (University of West Florida)**

[130]

*The Embodiment of Inequality of Subjugated Peoples in Seventeenth- to Twentieth-Century Latin America*

The human experience after European contact in Latin America was marked by various forms of embodied inequality and inequity. The correlates of economic inequality are examined here through a contextualized analysis of the human skeletal remains from two locations in Latin America: (1) from Guatemala at the Spanish San Bernabe Mission (ca. seventeenth century) and (2) from Belize with a sample of individuals who lived through its establishment as a British Colony (ca. eighteenth to twentieth centuries). Those interred within these precarious contexts document how sociopolitical policies marked the bodies of those being subjugated for the economic benefit of the colonial powers. Embodiment and phenomenological theory deconstruct how policy becomes practice that is inscribed into bone permanently marking the economic disparities that existed in the past.

**Miller Wolf, Katherine (University of West Florida)**

[130]

*Chair*

Miller Wolf, Katherine [69] see Cabrera, Kevin  
Miller Wolf, Katherine [91] see Santiago, Tiffany

Mills, Barbara [152] see Barvick, Kathleen

**Mills, Peter (University of Hawaii Hilo)**

[121]

*Archaeology of Multiethnicity in Hawaiian Ranching Sites*

Following the model of Kent Lightfoot's field schools at Fort Ross, a long-running program of archaeological fieldwork and training at the University of Hawai'i at Hilo has focused on the development of the "paniolo" identity (the Hawaiian word for cowboy) and the ranching communities in which they live. The field schools have not been advertised widely because the goal has been to engage with students from local descendant communities. Multiethnic communities are a particularly relevant subject on Hawai'i Island where the UH Hilo campus has been ranked repeatedly as the most ethnically diverse four-year public institution in the country by the Chronicle of Higher Education. The field school focus connects to the multiethnic heritage of many UH Hilo students, and fosters inclusivity through a community-based approach. Ranching remains an important part of Hawai'i Island lifestyles, and this setting

confronts the issues of settler colonialism while simultaneously exploring Hawaiian agency in emerging capitalist systems of the nineteenth and early twentieth centuries.

**Milon, Joshua (Wake Forest University) and Carla Hernández Garavito (Wake Forest University)**

[92]

*Huaro chiranos before and after the Inka: Results from ICP-MS Ceramic Analysis in Ampugasa and Canchaje*

Inka expansion in the Central Andes is often characterized by the introduction of new ceramic styles and designs. In Huarochiri (Peru), changes in the ceramics were associated with changes in architecture and the expansion of interaction networks. Archaeological and historical research suggests the people of Huarochiri were not a unified polity before the Inka arrival, and that a lack of coercion in the manner of conquest allowed local groups much more autonomy and continuity of their material culture than in other regions in the Andes. However, most studies consider local material culture to be a cohesive corpus despite the recognized lack of pre-Inka unification. This paper examines the relationship between the ceramics in two different sites occupied before and after the Inka conquest, each belonging to a different huarochirano community: Ampugasa and Canchaje. We present the results from ICP-MS ceramic analysis to investigate the continuities and discontinuities in local ceramic production between these periods. Through our results, we discuss the differences in domestic ceramics between both settlements, and connect them to the changes in the interaction among local huarochirano communities caused by the incorporation of Inka styles into local production and distribution networks.

**Milton, Emily (Michigan State University), Daniela Osorio (University College London) and Sarah Meinekat (Eberhard Karls University of Tübingen)**

[92]

*A Biocultural Approach to Environmental Isotopic Baselines: A Case Study from Southern Peru*

This research uses biocultural theory to consider possible sources of isotopic variation captured by biological tissues in Central Andean environments. The study area, in southern Peru, encompasses two archaeological sites, the coastal Quebrada Jaguay 280 and the high-elevation Cuncacha rockshelter, and associated resource procurement areas. Provenance analyses suggest exchange or direct movement occurred between ecological zones in the Terminal Pleistocene and Early Holocene. We sampled surface waters around key cultural areas to assess possible isotopic variability encountered by past communities. Results indicate Andean  $\delta^{18}\text{O}_{\text{water}}$  values are relatively higher during the dry season and lower in the wet season. Thus, yearlong consumption of a single water source may produce isotopic data consistent with annual changes in precipitation. Meanwhile, samples from the plateau revealed a substantial range of  $\delta^{18}\text{O}_{\text{water}}$  values across a relatively short distance (<30 km); additionally, overlapping values for high and low elevation locations. These data suggest interpretations of bulk  $\delta^{18}\text{O}_{\text{apatite}}$  likely conflate types of movement expected in the Andes, including subsistence, exchange, informational and network mobility, transhumance, and non-seasonal relocations of a group. Results highlight the importance of performing process-based field studies designed to thoroughly evaluate environmental variables affecting isotopic values before applying these systems to interpret the human past.

**Minette, Elizabeth, Zoe Milburn (Rollins College) and Zack Gilmore (Rollins College)**

[114]

*Learning through Legacy Collections: A Case Study from Central Florida*

Archaeological legacy collections are those that have been inherited from previous projects, researchers, or facilities. They routinely present significant curation and research-related challenges that include substandard preservation, uncertain provenience, inadequate or missing field records, and an absence of first-hand sources for filling informational gaps. Nevertheless, numerous studies have demonstrated the tremendous educational and research value retained by legacy collections subjected to serious rehabilitation efforts. This poster documents the rehabilitation and preliminary analyses of collections from Shell Island (8OR452), a precolumbian shell-matrix site on the Wekiva River in Central Florida. Between 1973 and 1982, Shell Island was the focus of three intensive, yet poorly documented, excavations by researchers from Rollins College. Since 2016, Rollins students and faculty have worked to breathe new life into the collections from these projects—repackaging and cataloging more than 10,000 individual artifacts, organizing and synthesizing countless paper records, and conducting additional fieldwork designed to contextualize existing materials. These efforts have enabled us to (1) reconstruct Rollins' past excavations at Shell Island, (2) illuminate more than 6,000 years of the site's precolumbian history, and (3) document and stabilize the Shell Island collections, ensuring that they will remain a valuable resource for teaching and research in perpetuity.

**Mink, Philip (University of Kentucky, W.S. Webb Museum Anthropology), Ashley Whitten (University of Kentucky), Elaine Gollihue (University of Kentucky), William Riekert (University of Kentucky) and Codi Scogin (University of Kentucky)**

[173]

*Re-walking the Walhalla: Recent Research in the Cape Final Area of Grand Canyon National Park*

The Cape Final area on the North Rim of the Grand Canyon has been surveyed by archaeologists for over 100 years. Scholars who have investigated this area include Neil Judd, Edward T. Hall, Doug Schwartz, and countless NPS staff archaeologists. In 2016, 2018, and 2021, archaeology students from the University of Kentucky participating in heritage management internships, surveyed a purported "blank" area in the Grand Canyon National Park Archaeological GIS. This poster will present the results of these recent surveys that resulted in the identification of six new sites found in a small 1 km<sup>2</sup> area that was previously thought to be devoid of archaeological materials.

Mink, Philip [77] see Napora, Katharine

**Minnis, Paul (University of Oklahoma)****[14]***The Other Consequential Mesoamerica-Southwest Interaction: Crops across Time and Space*

One of the most influential, if not the most influential, consequence of interaction between Mesoamerica and the US Southwest and northwestern Mexico (SW/NW) was the adoption of Mesoamerican-derived crops by Indigenous people in the SW/NW. This transfer occurred for millennia and over a wide region. It has most commonly discussed in relation to the question of local SW/NW communities adopted farming. Emphasized here instead is how crop transfer sheds light on other relationships that involved the SW/NW, such as ritual, ideology, and material culture.

Miranda de Morais, Hugo [108] see Lewis, Brandon

**Mitchell, Jannah****[27]***Remembering the Ancestor: Familial Histories in St. James and St. John the Baptist Parishes*

Prompted by the archaeological excavation at Evergreen Plantation, "Remembering the Ancestor: Familial Histories in St. James and St. John the Baptist Parishes" analyzes the ways in which silences in familial history affect how younger generations understand the rich, complex histories of these River Road parishes. Framed by Toni Morrison's claim that "if we don't keep in touch with the ancestor...we are, in fact, lost," this paper considers how the archaeological work at Evergreen, along with discussions both in and outside of the classroom, may help to circumvent these familial silences and allow younger generations to fully connect with Afro-Southern history.

**Mitchell, Mark (Paleocultural Research Group)****[52]***Discussant*

Mitchell, Peter [155] see Bonneau, Adelphine

Mixer, David [22] see Maybee, Brooke

**Mizoguchi, Koji (Kyushu University, Japan)****[139]***An Archaeological Approach to the Origin of "Axiality": Karl Jaspers's "Axial Age" Concept Revisited*

The concept of the "Axial Age" proposed by the Philosopher Karl Jaspers has fascinated scholars from a diverse range of disciplines and remains influential in the consideration of correlation between the development of social complexity and the transformation of the ritual-religious in the past. This paper focuses on the origin of "axiality" in the realm of religion by examining ritual-religious practices as forming a distinct communication system and by investigating how it evolved in relation to the spatio-temporal configuration of the other types of communication systems forming the total social system. The paper concludes that the axiality emerged when the uncertainties and risks of the world that had to be processed and coped with by the ritual-religious communication system became hierarchized and predictable, leading to the differentiation of the meta- or philosophical ritual-religious communication system and its continuing self-generation, culminating to the emergence of philosophy: the communication as to how to cope with the world.

**Moe, Jeanne (Institute for Heritage Education) and Samantha Kirkley (Southern Utah University)****[190]***Voices of the Ancients: Providing Safe, In-Person Teacher Workshops during a Global Pandemic*

In 2021, teachers from more than 30 states attended Voices of the Ancients: Archaeology and Oral Tradition in the American Southwest, an institute funded by the National Endowment for the Humanities (NEH). The institute, planned for the summer of 2020, was postponed due to the COVID-19 pandemic. Seventy-one teachers attended one of two weeklong institutes at Southern Utah University (SUU) in June and July respectively. While project personnel were successful in conducting both sessions in person, SUU required alternate plans for instruction and a rise in COVID cases would have forced cancelation of in-person sessions or major revisions to the schedule and venues. Taught by a team of educators, archaeologists, and Native American elders, the teachers experienced Project Archaeology curricula highlighting Fremont archaeological sites. They engaged with important landmarks of Fremont history and culture including the Parowan Gap Petroglyphs, Paragonah Mounds, and Fremont Indian State Park. Speakers from local tribes provided important insights into ancestral connections to the landscape and contemporary issues of cultural heritage preservation. Initial analysis of learning outcomes indicates that the participants valued their experience, learned the basics of Fremont archaeology, and understood the importance of including Native voices in the narrative of American history.

Moes, Emily [26] see Trask, Willa

**Moholy-Nagy, Hattula****[53]***You Want to Put It Where? The Function and Meaning of Trash in Ritual Recovery Contexts*

Much human behavior creates waste, and all sedentary communities need to find ways to manage trash that disappears slowly or not at all. Trash could be left where it was produced, processed by breaking or burning, deposited in a designed place, or recycled into various kinds of construction. Trash recovered from residential contexts tends to be uncontroversial, that is, it is usually interpreted as the discards of everyday activity. But there exists a range of opinion about the function and meaning of trash in ritual or ceremonial special deposits, notably in burials and offerings. The kinds of materials deposited in burials and offerings have been a longtime interest of Marshall Becker's. Here I will consider ritualized trash as an aspect of the systemic context of a community as a whole to try to understand its function and meaning. Site maintenance through time at the Lowland Maya city of Tikal, Guatemala, will serve as an example.

**Mollard, Belinda (Gila National Forest)****[86]***Understanding a Ritual Landscape: An Investigation into the Rock Art of the Jornada Mogollon Region of the American Southwest*

The Tularosa Basin is a region rich in rock art sites associated with the Jornada Branch of the Mogollon Culture. Sometime around AD 1450, the Jornada ceased to exist as a distinct archaeological expression. The tendency to focus on "monumental centers" and diffusion of ideology has left a gap in the research for this area. My overarching research goal was to integrate rock art with the landscape and the people to gain an understanding of rock art as social practice. I examined the role location played in the worldview of the Jornada people, and how they modified this landscape according to those beliefs. Pueblo concepts of emergence and transformation played a much larger role in the everyday lives of the Jornada than previously thought, and the evidence indicates cosmology heavily influenced their settlement patterns. Through this study, rock art was addressed in a new context. My dissertation incorporated place-making theory and the notion of places as didactic resources to highlight the relationship between material culture and the ritual use of space. I employed an amalgamation of design and practice to gain a better understanding of this historically understudied group.

**Mollenhauer, Jillian (Metropolitan State University of Denver)****[55]***Likeness, Presence, and Portraiture in Olmec Art*

The colossal heads of the Formative Gulf Olmec have long been discussed as portraits, owing to the distinct physiognomy that allows each one to be distinguished from the others. These monuments are often presented as the epitome of both likeness and naturalism in Mesoamerica, the pinnacle of an artistic style marked by naturalistic representations of human actors whose appearances range from the generic to the particular. Western audiences typically associate such naturalism and attention to physiognomic particularity with the genre of portraiture. However, Mesoamerican portraiture in later periods neither favored naturalism nor relied on likeness to connect icon with living agent. Rather, graphic signifiers—in the form of text, costume, or some combination thereof—were used to express both individual and social identities. We may consider, then, what evidence exists for portraiture among the Olmec, aside from a high level of naturalism? If Olmec artists did deploy likeness to denote individual personhood, why did later cultures choose to eschew it? How might the artistic choice to work naturalistically have been informed by the function(s) of these images? This paper will reconsider the subject of Olmec portraiture in relation to the broader conventions and receptions of Mesoamerican art.

**Møller, Kirstine****[130]***Colonial Discourse and Conflict in Nineteenth-Century Kalaallit Nunaat***[WITHDRAWN]**

Møller, Kirstine [33] see McGovern, Thomas

**Monge, Susan (University of Illinois at Chicago)****[125]***Between Culinary and Consecrated: The Use and Management of Turkeys (*Meleagris sp.*) in Southern Greater Nicoya*

Animal management practices have played critical roles for ancient societies, supporting reliable sources of food and other animal-derived products, while also impacting relationships between people, animals, and their environments. In this paper, I will explore the acquisition, access, and use patterns of turkeys (*Meleagris sp.*) in the Guanacaste region of Greater Nicoya. In addition to iconographic and ethnohistoric data, preliminary results from osteological and genetic analyses of turkey remains from various archaeological sites suggest that these non-native birds may have been a restricted resource that concurrently served as indicators of social organization. This investigation aims to contribute to our understanding of human-environment interactions and address social aspects of animal management practices within ancient Greater Nicoya societies during a period of important sociopolitical changes and increasing social inequality.

**Monge, Susan (University of Illinois at Chicago)****[125]***Chair*

Monnier, Gilliane [147] see Tostevin, Gilbert

**Monroe, Shayla****[122]***Cattle Connections: Livestock and Social Networks in Ancient Nubia*

I present an overview of how cattle were used to mediate social, kinship, and political networks Lower Nubia and its surrounding deserts. The cattle sacrifices of the Wadi Howar region (5500 BC), the intermittent influx of pastoralists into the Middle Nile Valley (between 5000 and 3000 BC), and the possible distribution of a distinctive cattle type throughout Nubian C-Group enclaves (between 2000 and 1600 BC) all offer the opportunity to synthesize the economic, symbolic, and social uses of cattle. Applying appropriate ethnographic models may help us propose mechanisms as well as various human motivations for using cattle toward social and political ends. The use of cattle to mediate social and political relationships in the Middle Nile Valley fits into a much larger story of the unique entanglement between the genus *Bos* and the genus *Homo* throughout African history.

**Monroe, Shayla****[122]***Chair*

Monroe, Shayla [122] see McClure, Sarah

Montalvo, Carlos [124] see Dyrdaahl, Eric

**Montero, Gabriela (University of Kentucky)****[145]***Introducing PAMLAS: Change and Continuity in Postclassic, Colonial, and Contemporary Veracruz, Mexico*

Research on Postclassic and colonial occupations in the Eastern Lower Papaloapan Basin is an emerging field in Veracruz archaeology, as sites of these periods had not been documented there until recently, by Pool and Loughlin (2014–2017). Research on more eastern Postclassic sites of the Tuxtlas by Venter (2008) and Arnold (2003), on the other hand, has demonstrated that southern Veracruz played an important role in the economic, political, and social configurations of the time. Moreover, Pool and Loughlin's archaeological survey (RRATZ) and historical documents indicate that Indigenous communities in the region experienced the arrival of the Spanish Empire in the sixteenth century. The Proyecto Arqueológico Mazapa-La Sierra, concluding its first field season in 2021, provides southern Gulf Coast archaeology with data on two archaeological sites with occupations that span the Postclassic, colonial, and contemporary eras. This paper introduces PAMLAS, summarizing its first field and laboratory seasons and presenting some preliminary observations regarding long-term change and continuity in the Eastern Lower Papaloapan Basin. Presenting this project's first excavation program, auger tests, and their corresponding ceramic analysis data, will provide initial insights into the region's Postclassic and colonial landscape, and it will contextualize the rest of this session's presentations.

**Montero, Gabriela (University of Kentucky)****[145]***Chair*

Montero, Gabriela [145] see Cuevas, Mauricio

Montero, Gabriela [145] see Lindquist, Shayna

Montero, Gabriela [145] see Ortega, Martín

**Montgomery, Lindsay (University of Arizona)****[195]***Discussant*

Montgomery, Shane [54] see Micheletti, George

Montgomery, Shane [210] see Stricklin, Dominica

**Montoya, Joaquin (Los Alamos National Laboratory)****[102]***Inventory of Rock Art on the Pajarito Plateau*

Rock art panels are a common component of Ancestral Pueblo sites across the Pajarito Plateau. This rock art takes the form of glyphs either pecked into the cliff faces of volcanic tuff, or incised/pecked into sooted cavate chambers. A cataloging of the rock art will review iconographic similarities and differences of known rock art of the area. Such iconographic distinctions may contain useful information, especially when perceived through the lens of group identity. This study will also investigate the possibility of seasonal significance associated with certain panels. Possible results might reflect a shifting cultural boundary between the Keres and Tewa cultures, based in the occurrence and distribution of iconographically similar glyphs.

Montoya Cabrera, Ana [92] see Martini, Sarah

**Moonkham, Piyawit****[18]***Holy Smokes: Historical Use and Residue Analysis of Cannabis and Smoking Pipes from a Northern Thai Temple*

Archaeological evidence of cannabis indicates that the plants have been commonly used in various regions of Asia, especially in Japan, China, and India around 10,000–6,000 years ago. Many parts of the plants were used for various purposes and forms including cooking, smoking, recreational, medical, and religious. Despite a significant number of archaeological evidence of smoking pipes found in historical sites in Southeast Asia, the research on the use of cannabis is rare among Southeast Asian scholars compared to other types of psychoactive plants. Furthermore, there has been, to date, no direct biomolecular evidence of cannabis associated with any individual smoking pipes found in the region. With sediment samples recovered from nine smoking pipes from one historical temple (Site 9) in Chiang Saen, Northern Thailand, this research aims to determine whether the key biomarker associated with ancient cannabis—cannabinol (CBN)—is detectable via LC-MS. The result shows chromatographic signals in retention time intervals characteristic of both alkaloids and cannabinoids. Since the smoking pipes discussed here were found in the temple ground, we present the evidence to assess if historically local communities in Chiang Saen used cannabis for smoking for either religious or recreational purposes.

**Moore, Jerry (CSU Dominguez Hills)****[49]***Discussant*

Moore, Logan [20] see Lillios, Katina

**Moragas, Natalia (University of Barcelona), Alessandra Pecci (University of Barcelona) and Maria Torras (Gerda Henkel Fellowship)****[220]***Living among the Ruins of the City of Teotihuacan, Mexico*

The collapse of the ancient city of Teotihuacan (550–650 CE) is one of the most important moments in Mesoamerican archaeology, due to the fact that it caused cultural and sociopolitical changes along this extensive territory. Mesoamerica offers the possibility to understand urban development but also the opportunity to study lost cities and their perception and historical evolution. Rather than looking for the reasons behind the great crisis that befell the Teotihuacan culture, we are working on an ongoing project focused on the moment in which the process of collapse was fully accomplished, and the city was lost in the memory of the indigenous society and redesigned in a very different sociocultural and economic system by its new settlers. Thus, the aim is to understand the perception of and living in the abandoned city of Teotihuacan. The primary aim of this contribution is to describe and analyze the first results of the project, and discuss the next steps, in order to answer the question: How do you live in an abandoned city?

**Morales-Aguilar, Carlos (University of Texas at Austin)****[11]***The Transition from the Preclassic to the Early Classic in Northern Petén, Guatemala*

The Late Preclassic period in the Central Maya Lowlands was a time of high sociopolitical development with the rise of urban centers with monumental architecture and the emergence of more complex societies. By the end of the Preclassic period, a significant change occurred in Northern Petén caused by the demise of El Mirador state. The transition from the Preclassic to the Early Classic is marked by the cessation of construction of civic and public architecture and the abandonment of elite residential units. Using data from excavations and regional settlement surveys in several sites throughout the Naachtun-Mirador area, this paper will address the possibility of how the sociopolitical changes and cultural continuities contributed, from a regional perspective, to the new forms of political and territorial organization of the Early Classic societies in Northern Petén.

**Morales-Aguilar, Carlos (University of Texas at Austin)****[11]***Chair*

Morales-Aguilar, Carlos [11] see Hansen, Richard

Morales-Aguilar, Carlos [11] see Hiquet, Julien

**Moratto, Michael (None.)****[219]***INFOTEC Research Inc.: A Pioneer CRM Firm*

Founded in California, INFOTEC Research Inc. grew during the 1980s and 1990s to become a full-service cultural resource management (CRM) company with multiple offices and nearly 200 employees who completed more than 350 projects for myriad clients in seven western states. The firm performed CRM studies at a pace and scope beyond the capability of most universities and small businesses. Involving scores of agencies, tribes, academic specialists, commercial labs, and independent consultants, INFOTEC's projects significantly advanced our knowledge in such fields as prehistoric and historical archaeology, geomorphology, ethnography, and local history while serving the needs of descendant and other communities, legal compliance, and heritage preservation.

**Morehart, Christopher (Arizona State University)****[133]***Discussant*

Morehart, Christopher [172] see Villasenor Iribre, Eunice

**Morell-Hart, Shanti (McMaster University)****[151]***Tubers, Grain, and Everything In Between: Mesoamerican Applications of Dolores Piperno's Research***[WITHDRAWN]****Morell-Hart, Shanti (McMaster University)****[125]***Discussant*

Moreno, Federica [63] see López Mazz, José

Moreno Cabrera, Cuauhtémoc [62] see Antorcha Pedemonte, Ricardo

**Morgan, Brooke (Illinois State Museum)****[180]***Moderator***Morgan, Christopher (University of Nevada, Reno), Loukas Barton (Dudek Inc.), Bayarsaikhan Jamsranjav (National Museum of Mongolia) and Tuvshinjargal Tumurbaatar****[139]***Paleolakes, Archaeology, and Late Quaternary Paleoenvironments in Arid Northwestern Mongolia*

The climatic and hydrographic regime of Terminal Pleistocene and Holocene northwestern Mongolia is reconstructed using archaeological and pedological datasets at Bayan Nuur, a lake on the northwestern perimeter of the Altan Els dunefield in Uvs Province, Mongolia. The archaeological data consist of land use patterns controlled for time via surface collection and time-sensitive, diagnostic artifacts. The pedological data consist of soils analysis and radiocarbon dating of paleosols. These data are combined in a GIS to ascertain site and paleosol geographic relationships to modern lake levels at Bayan Nuur. They point to a more xeric Younger Dryas than previously recognized, significant Holocene lake regressions, but also late Holocene lake transgressions that had previously been unrecognized. Combined, these data point to a very complex Late Quaternary picture of paleoclimate and paleoenvironment across the region.

**Morgan, Christopher (University of Nevada, Reno)****[139]***Chair*

Morgan, Jesse [196] see Dillian, Carolyn

Morgan, Michele [209] see Hernandez-Bolio, Gloria

Morin, Morgane [169] see Wadford, Tabatha

Morisaki, Kazuki [120] see Izuho, Masami

**Morrow, Giles (Vanderbilt University)****[9]***Seeking Refugia on the North Coast of Peru with Boots on the Ground and Eyes in the Sky: Expanding the "Total Coverage" Archaeological Surveys of the Jequetepeque and Santa Valleys through Systematic Analysis of Satellite Imagery*

Archaeological settlement surveys of the Peruvian north coast have expanded from Willey's pioneering Virú Valley Project of 1946 to cover a significant portion of the 13 coastal valleys that compose the social context of this region. From the La Leche Valley in the north to the Huarmey Valley in the south, the arid Andean foothills have been surveyed in a piecemeal fashion over the past 75 years to varying degrees of intensity. Variations in research questions and survey design rigor in relation to changing geospatial techniques make comparison between these surveys difficult. The current paper presents the application of the GeoPACHA platform to reconsider two previously surveyed areas through systematic analysis of satellite imagery. The Jequetepeque Valley survey (Dillehay and Kolata 1997–2004) and Lower Santa Valley survey (Wilson 1979–1980) were chosen as target regions due to their relatively complete coverage. The current study determines if these surveys were able to define the distribution of numerous

hilltop fortified settlements built during Middle Horizon and Late Intermediate periods. By comparing the results of this form of digital survey to those of pedestrian techniques, this paper tests how the GeoPACHA platform can ameliorate and potentially expand previous research efforts in this region.

Mothulatshipi, Sarah [149] see Nash, David

**Motta, Laura (University of Michigan)**

[71]

*Dating Millet from the Apuseni Mountains: Evidence for Intercultural Contact with the Asian Steppes during the Bronze Age*  
In the last decade, millet has been the focus of intense debates ranging from the role of agropastoral societies of the Eurasian steppes in its westward movement, to the timeframe as well as the economic and cultural mechanism of its adoption as crops in Bronze Age Europe. Charred remains of millet have been found at two sites, Teius-Fantana Viilor and Petelca-Cascada, in the Apuseni Mountains (SW Transylvania). These sites have been investigated as part of the Bronze Age Transylvanian Survey (BATS) Project aimed at understanding settlement patterns and socioeconomic change in an important mining district of the Carpathian Mountains. The seeds have been directly radiocarbon dated to the second half of the second millennium BCE. While millet has been attested in a handful of other Bronze Age sites in the Carpathian basin, the Transylvanian finds better define the chronology for its introduction and carry interesting implications on the nature of the interactions between the local Middle Bronze Age Wietenberg Culture and the Noua steppe culture that moved into the region in the late Bronze Age.

Mountjoy, Nate [4] see Thomas, Prentice

**Moyes, Holley (University of California, Merced)**

[153]

*Investigating the Underworld: Ten Years of Regional Cave Research in Belize, Central America*  
The country of Belize, Central America, sits atop Cretaceous limestone, supporting literally thousands of caves in the region mostly clustered in the central and western areas. Many, but not all, of these sites were used by the ancient Maya who modified the cave space and deposited complex artifact assemblages, creating excellent opportunities for archaeological investigation. In Maya cosmology, caves are salient features of the landscape that serve as entrances to the earth and underworld. Therefore, for the ancient Maya these spaces became important ritual venues for the propitiation of deities residing therein, thus providing an unambiguous context for the study of ancient Maya ritual practices and their changes over time. From cave deposits, archaeologists can infer relationships between socio/political entities and environmental stresses, observe ritual transformations and political maneuverings, define ethnic differences among communities, and better understand Maya aesthetics and poetics. Since 2011, the Belize Regional Cave Project and the Las Cuevas Archaeological Reconnaissance investigated and recorded cave sites in Belize on a regional scale. Collectively, the projects have reported over 100 sites and to date have recorded 28. This paper summarizes findings from these projects and discusses the impacts of cave research on Maya archaeology and cultural heritage.

Moyes, Holley [54] see Micheletti, George

Moyib, Olusegun [106] see Ogundiran, Akin

**Mraz, Veronica (Iowa Office of the State Archaeologist)**

[52]

*Chipping Stone: An Examination of the Chipped Stone and Ground Stone Artifacts recovered from the Joy Creek Major Site (13PM7)*

A small collection of lithics and ground stone tools were recovered from the Joy Creek Major site (13PM7), located in northwestern Iowa. 13PM7 is a Mill Creek site, which is classified as part of the Initial Middle Missouri variant. This paper will examine the results of a lithic, debitage, and ground stone tool analysis recovered from 13PM7. Special attention will be placed on the debitage as some of the flakes recovered could be the result of ground stone tool creation rather than the chipped stones. The results from this analysis will help address daily activities at the site. Finally, the trends exhibited at this site will be compared to other Mill Creek sites.

**Mueller, Natalie (Washington University in St. Louis), Steven Goldstein (Max Planck Institute for the Science of Human History), Rita Dal Martello (Max Planck Institute for the Science of Human History), Emmanuel Ndiema (National Museums of Kenya) and Nicole Boivin (Max Planck Institute for the Science of Human History)**

[186]

*Archaeobotanical Remains from Kakapel Rockshelter, Western Kenya*

Excavations at Kakapel rockshelter from 2018–2020 revealed archaeological deposits rich in carbonized plant material spanning most of the Holocene (cal. 9500–200 BP). These deposits present a rare opportunity to study changes in plant use and anthropogenic environments in western Kenya over a vast time span encompassing the transition to food production. We floated a total of 1,450 L of sediment from five trenches at Kakapel. Here, we report the results of the analysis of the plant material recovered from these samples. Crop remains include finger millet (*Eleusine coracana*) and sorghum (*Sorghum bicolor*), which we compare to modern landraces and other archaeobotanical assemblages to better understand agricultural practices at Kakapel. This assemblage also contains dozens of wild plant species, many of which have yet to be identified. Plant remains from Kakapel reveal a diverse and

little-known subsistence base and highlight the need to create comprehensive and accessible comparative collections for the identification of plant remains in this region.

Mueller, Natalie [186] see Goldstein, Steven

**Muir, Brianna (University of Central Florida), Hiep Trinh (Institute of Archaeology, Hanoi, Vietnam), Anna Willis (James Cook University), Kate Domett (James Cook University) and Marc Oxenham (Australian National University)**  
[26]

*Exploring Personhood and Identity in an Early Seventh-Millennium Hunter-Gatherer Community in Northern Vietnam*

This paper explores the mortuary evidence for constructed aspects of personhood and identity at Con Co Ngua, an early seventh millennium BP hunter-gatherer community in northern Vietnam. We approach this analysis through our knowledge of (1) grave construction, (2) body positioning by way of field anthropological techniques, (3) corpse manipulation (including extensive limb mutilation), (4) spatial distribution of burials by age, sex, body treatment and orientation, and (5) data relating to lifeways and environment. The results of our analyses indicate that while individuals were not differentiated in burial treatment by biological sex, age was an important factor, specifically between adults and subadults, providing insight into conceptualizations of personhood and identity at the site. To conclude, identity at Con Co Ngua is not constructed in terms of complex material cultural interactions as seen in Neolithic communities in the region, but rather by way of equally complex forms of manipulation and positioning of individuals. Indeed, if anything a more nuanced degree of complexity of funerary treatment is seen in ancient hunter-gatherers in the region than later farming communities.

**Mukusha, Lawrence (Kent State University), Michelle Bebbler (Kent State University), Briggs Buchanan (University of Tulsa), Alastair Key (Cambridge University) and Metin Eren (Kent State University)**  
[187]

*Aluminum as a Substitute for Chert in Prehistoric Ballistics Research*

The use of a modern material substitute in an archaeological experiment can offer several benefits to experimental method, design, control, replicability, feasibility, and cost, but it should be directly compared to its "traditional" analogue to understand similarities and differences. Here, aluminum is introduced as a substitute for chert in prehistoric ballistics research because, critically, aluminum is safe, inexpensive, easy to process, and it and chert possess densities that differ by less than 4%. The aluminum casting process for replicating stone artifacts is presented, and it is shown that the aluminum castings are essentially identical in form, flake-scar patterning, and mass to their stone counterparts. A proof-of-concept ballistics experiment that demonstrates no difference between aluminum and stone points in terms of target penetration is then presented. While aluminum castings should not be used as a substitute for stone in all ballistics experiments, they can provide numerous advantages. Chief among these advantages is that archaeologists can cast and use a nearly exact replica of prehistoric artifacts in experimental tests. Questions or skepticism about whether a flintknapper is accurately replicating artifacts can be eliminated because, at least in terms of artifact form, flake-scar patterning, and mass, the "real" artifact is being tested.

**Mullins, Patrick (University of Pittsburgh) and Alicia Boswell (University of California, Santa Barbara)**  
[84]

*Many Borderlands, Distinct Histories: Comparing the Late Intermediate Period (900–1470 CE) Chaupiyungas of the Moche Valley*

Though the chaupiyungas of the western Andes share their positioning as geographic boundaries between the highlands and coast, there is considerable variability in the physical landscapes and human histories of these regions. Articulating this variability through comparison is one way we can reach a better understanding of the dynamics of these borderlands. In this paper, we use survey and excavation data to examine and compare the landscapes and histories of the Sinsicap and Upper Moche chaupiyungas of the Moche Valley during the Late Intermediate period (900–1470 CE). Ceramic assemblages and architectural features from survey data suggest these chaupiyungas experienced an influx of investment in settlement, colonization, and political involvement from the coastal Kingdom of Chimor, local highland actors, and even elements of the Inka Empire. Despite exhibiting superficial similarities, these data can be combined with more fine-grained excavation data from the Sinsicap frontier community of Cerro Huancha to show how the different histories and experiences of those who settled in these chaupiyungas led to distinct landscapes and communities. Exploring these themes, we endeavor to shed light on the lived experiences of those who call(ed) the chaupiyunga their home while understanding how the regions are defined as borderlands.

**Mullins, Patrick (University of Pittsburgh)**  
[84]

*Chair*

Mumary, Pablo [11] see Folan, William J.

Mundt, Jessica [12] see Janesko, Sarah

Munger, Tressa [116] see Koenig, Charles

Munoz, Cynthia [114] see Mauldin, Raymond

Muñoz, Marissa [136] see Razo, Mikaela

**Muñoz Rojas, Lizette (University of Pittsburgh), Susan deFrance (University of Florida), Nicola Sharratt (Georgia State University), Verónica Rosales Hilario (Universidad Nacional Mayor de San Marcos) and Alejandra Tazza Ulloa (Universidad Nacional Mayor de San Marcos)**

[217]

*Plants, Animals, and Pottery: Local and Regional Interaction at Tumulaca la Chimba during the Late Intermediate Period*

Stylistic analyses of material culture have long been central to archaeological reconstructions of cultural diversity in Andean South America during the Late Intermediate period (LIP). Coupled with recent applications of compositional analyses of craft goods, artifact form and style also offer insight into inter and intraregional trade and exchange between late prehispanic groups. In this paper, we complement existing object-focused perspectives by considering how diet and culinary choices were affected by and contributed to local processes of ethnogenesis and to inter-group interactions during the LIP. We discuss the results of faunal and archaeobotanical analyses of both pre-AD 1250 early LIP (Tumulaca occupation) and late LIP (post-AD 1250) Estuquiña domestic and mortuary contexts at the site of Tumulaca la Chimba, in the upper Moquegua Valley, Peru. We examine the archaeobotanical and faunal data in conjunction with data derived from compositional analyses of pottery to suggest that despite evidence for growing hostilities in the later LIP, extra-local interactions, particularly with the coast, increased through time, but access to nonlocal resources was restricted to specific products.

**Munro, Kimberly (Otero College), David Chicoine (Louisiana State University) and George Lau (University of East Anglia)**

[84]

*Roads as Bridges: Assembling Communities and Borderlands over the Longue Durée in Western Ancash*

This paper explores ancient roads, paths and the contingencies of their use and context in western Ancash, north-central Peru. We approach roads and their connected networks as more-than-human actors that played a critical role in shaping ancient interactions as well as assembling communities over the *longue durée*. We frame the agency of ancient roads with evidence of least-cost paths, settlement location, and other structuring dimensions of the geographic landscape, while recognizing the importance of human-thing relationships. Conceptualizing human settlements and routes as agentive nodes of interaction helps us shed light on three moments in Ancash prehistory: (1) the Late Pre-ceramic, (2) the Early Horizon, and (3) the Early Intermediate period. By taking a comparative *longue durée* approach, the case studies bring insights into longitudinal shifts in mobilities, community building, and territoriality on the western slopes of the Cordillera Negra. The study highlights the fluidity of ancient borderlands and the structuring role of anthropogenic alterations in building communities and identities.

Munro, Kimberly [129] see Bria, Rebecca

**Munro, Natalie (University of Connecticut) and Leore Grosman (Hebrew University of Jerusalem)**

[16]

*Natufian Population Dynamics in the Levantine Upper Jordan Valley and Mediterranean Hills: A Zooarchaeological Study*

This presentation takes a high-resolution zooarchaeological approach to explore variability in forager adaptations in two regions of the southern Levant early on in the transformation to agricultural communities. Using the faunal assemblage from the large Late Natufian settlement of Nahal Ein Gev II in the Upper Jordan Valley as a launching pad, we compare local population dynamics among Natufian sites in the Jordan Valley with those in the adjacent Mediterranean Hills. Through the lens of regional Late Epipaleolithic population dynamics (population movement, site occupation intensity and the impacts of sedentism), we discuss the pathway to early agricultural societies in the southern Levant. Importantly, throughout this presentation, we explore how lessons from the seminal career of Mary C. Stiner provided a theoretical and methodological inspiration for this research program.

**Munro, Natalie (University of Connecticut)**

[16]

*Chair*

**Munson, Jessica (Lycoming College) and Jonathan Scholnick (Bucknell University)**

[54]

*Beyond House Size: Social and Embodied Dimensions of Inequality in the Ancient Maya Lowlands*

House size provides a reliable, comparative measure of household wealth that enables archaeologists to track global trends in inequality across a range of sedentary societies. Such approaches hold particular promise for Maya archaeology given its long history of settlement pattern research and recent applications of lidar to map large areas surrounding ancient Maya cities. As a singular proxy estimate, however, house size is limited in its ability to capture the full range of factors that contributed to inequality in the past. Drawing on more holistic approaches that focus on overall human well-being, this paper compares traditional house size-based measures of wealth with other quality of life indicators. Settlement pattern data from the Upper Usumacinta Confluence Zone, recently collected by the Proyecto Arqueológico Altar de Sacrificios, combined with previously published excavation data provide a robust dataset to evaluate alternative measures of wealth beyond house size. Results of this study not only contribute to ongoing comparative research on household inequality in the Maya lowlands, but also highlight the potential to produce a more detailed understanding of socioeconomic life in the past.

**Murakami, Tatsuya (Tulane University) and Kenichiro Tsukamoto (University of California, Riverside)****[13]***Introduction: Governing Urban Societies in Ancient Mesoamerica*

The legacy of Max Weber is so profound we have hardly moved our discussion of power beyond concepts of authority, domination, and legitimacy. This leads inevitably to a dichotomous conception of society in which there are rulers and ruled, and rationality is the prominent explanation of human action and perception. Society, however, consists of more than the rulers and ruled, and so we use the concept of governance to overcome this overly simplistic view. Governance is not limited to government but refers to all "self-organizing, interorganizational networks." These governing structures are shaped at multiple scales by infrastructure and social forces that include hierarchies (e.g., bureaucracy), civil society (e.g., non-official sectors), and networks (e.g., interdependence between the two; local, regional, and interregional relations). We add to this list natural resources and urban infrastructures, important actors whose influence produces historically specific governance structures. In scrutinizing theory on social and socio-material relations, this paper highlights conceptual frameworks for understanding power in more nuanced ways than Weberian notions of authority, domination, legitimacy, and rationality. We apply these tools to Mesoamerican case studies, showing that Mesoamerican archaeology on urbanism still has much to contribute to understanding commonalities and difference in governance structures.

**Murakami, Tatsuya (Tulane University)****[13]***Chair*

Murakami, Tatsuya [13] see Jurado, Alexander

**Muro, Luis (Field Museum of Natural History)****[189]***From Discrete Frontiers to Cross-Cutting Religious Networks: Religious Monuments and Cultural Syncretism in Peruvian North Coast and Highland, Ninth to Eleventh Centuries AD*

Colonialist perspectives of territorial expansion envision the political entities as spatially defined by discrete frontier boundaries. Under this approach, the distribution of objects of a given cultural style parallels the area of influence of the groups that produced such style. This approach, however, fails to account for the dissemination of intangible expressions of culture. In this paper, I seek to re-position the role of religion in the debates of cultural change, syncretism, and ethnic symbiosis in Andean archaeology. By drawing on my own research in San José de Moro and its monumental landscape, I look to further investigate the relationships between the built landscape, religion, and cultural identity in the Peruvian northern region during the Middle Horizon. Particular and recurrent features in religious monumental buildings, from both the Peruvian north coast and highland, suggests that coastal and highland societies were interlinked not only through trade networks and political affinity but also shared religious worldviews and death ideologies, which can be better understood as cross-cultural religious networks.

Muros, Vanessa [155] see Bongers, Jacob

Murphy, Reg [166] see Brown, Matthew

Murray, Emily Jane [127] see Miller, Sarah

**Murray, John (Arizona State University), Jacob Harris (Arizona State University), Andrew Zipkin (Arizona State University), Simen Oestmo (Nelson Mandela University) and Curtis Marean (Arizona State University)****[90]***A New Multiproxy Approach to Distinguish Aboveground and Belowground Lithic Heat Treatment Methods*

Recent research in lithic heat treatment technology has focused on developing probabilistic, quantitative, and replicable methods for accurately identifying heat treated artifacts. Lithic heat treatment is first recognized by 160 ka in South Africa at Pinnacle Point 13B. The complexity of the heat treatment process may have implications for recognizing an advanced cognition, and a debate has arisen regarding the intricacies of the procedure. More specifically, it is debated whether early heat treatment technology was conducted using an aboveground technique in which the raw material is heated directly by the fire or coals, or whether it is buried below the fire in a sand-bath and heated indirectly by the sand. Here, we combine the 3D surface roughness method with quantitative color data to examine differences between silcrete heated using aboveground and belowground techniques. We conducted actualistic experiments in which nodules of silcrete from multiple sources in South Africa were heated using 15 kg of wood fuel. Our preliminary results suggest that the sand-bath technique more consistently reduces surface roughness of silcrete with less risk of fracture due to overheating. Further, the aboveground method makes silcrete lighter in color whereas the belowground method makes silcrete darker.

Murray, John [90] see Carroll, Peyton

Murray, John [39] see Hirniak, Jayde

Murray, John [20] see Huang, Cindy Hsin-yee

Murtha, Timothy [54] see Schroder, Whittaker

**Musser-Lopez, Ruth (CSUSB)****[222]***Lump or Split? Determining Archaeological Site Boundaries Using Spatial Statistical Analysis*

Archaeological loci can be combined into sites delineated by meaningful boundaries justified by natural features such as landform and elevation, can replace formerly large unwieldy site boundaries, and can be useful for analysis of data and future management. Spatial Autocorrelation software for the Moran I statistic in ArcGIS v10.6 was used to combine archaeological site location data with "intensity" or weight defined by the number of artifacts in each of 280 loci contained within an 80-acre project area portion of CA-SBr-1456 along the California side of the Lower Colorado River. That data was then processed to create a spatial weight matrix to determine any non-random distribution of similar loci defined by types of prehistoric features and artifacts, 254 of which represent one of four stone tool manufacturing technologies, likely from different eras. The "Local Moran's I" (Anselin et al. 1996) cluster and outlier analysis tool of the same application was then used to determine any existence of "hot spots" or clusters which could potentially define site boundaries of related artifact clusters or loci. The analysis revealed a patterned distribution of prehistoric tool technology clusters with indications of chronological staging on various benchmarks of the river shoreline.

Myagmar, Erdene [99] see Wilkin, Shevan

**Napolitano, Matthew (International Archaeological Research Institute Inc.), Robert DiNapoli (Binghamton University), Jessica Stone (Museum of Cultural and Natural History), Jonathan Hanna (Grenada National Museum) and Scott Fitzpatrick (University of Oregon)****[19]***Modeling Demographic Change in the Caribbean*

A recent synthesis of radiocarbon dates in the Antilles and circum-Caribbean indicated two major precolonial population dispersals that correspond to the long-standing cultural divisions of the region's Archaic and Ceramic Ages. Using the most reliable dates from this dataset, we constructed both region-wide and local summed probability distributions (SPD) for use as proxies of population fluctuations over time. We then juxtaposed these with the largest compilation of radiocarbon dates available from South America along with several climatic datasets and a volcanic record for the Caribbean. Results suggest that there was a potential influx of people during the middle Early Ceramic period ca. AD 100–300, a transition in human-climate interactions at the start of the Late Ceramic period ca. AD 700, demographic shifts with the supposed arrival of the "Island Caribs" ca. AD 1200, and a potential "depopulation" of some islands before European arrival several centuries later. Using these multiproxy datasets, our analyses help reconstruct initial human migration, mobility, and Indigenous interaction in the region over time.

**Napora, Katharine (University of Kentucky Webb Museum of Anthropology), Carla Hadden (University of Georgia Center for Applied Isotope Studies), George Crothers (University of Kentucky Webb Museum of Anthropology), Philip Mink (University of Kentucky Webb Museum of Anthropology) and Lisa Guerre (University of Kentucky Webb Museum of Anthropology)****[77]***Multi-method Analysis of a Historic Wooden Trough from Kentucky, USA: Verifying Artifact Biographies with Archaeometry*

We discuss the results of a multi-method analysis of a large wooden trough held at the Webb Museum of Anthropology at the University of Kentucky that oral history indicates was made by enslaved saltpeter miners working in Mammoth Cave in the early nineteenth century. Using dating methods as well as elemental analyses, we examine evidence supporting the creation date, geographic origin, and use of the wooden trough. This case study illustrates how archaeometry can be used to study and verify historic artifact biographies and enhance the understanding of the experiences of underrepresented persons.

Nash, Aemie [24] see Campbell, Janice

Nash, Aemie [4] see Thomas, Prentice

**Nash, Brendan (University of Michigan), Thomas Talbot (Independent Researcher) and Henry Wright (University of Michigan)****[97]***Excavations at the Belson Site: A Clovis Locality in SW Michigan (2020–2021)*

The Belson site is on an outwash plain draining the Early Algonquin Stage (14 kya) central Great Lakes SW across Lower Michigan into the Ohio tributaries. By 13 kya the St. Joseph River had incised multiple channels into this plain. On a terrace north of a now-abandoned channel, detailed surface study by Talbot from 2005–2018 showed three clusters of fluted points and fragments, scrapers, graters and other tools, largely of Attica chert procured from 235 km SW of Belson. Study of the surface sample published by the authors in 2021 indicates these tools were made with Western Clovis technological patterns. Excavation in 2020–2021 revealed a buried cluster of artifacts in the lower, less-disturbed terrace sediment. Plotting of items >2 mm in length shows that the cluster was about 10 cm below the plowed deposit and covered least 30 m<sup>2</sup>. These are similar to the published inventory with the addition of more manufacturing debris and small refurbishing flakes. Samples of sediment and charcoal for identification and dating await study. We hope to finish excavating the central cluster and test the adjacent peat-filled channel where we can expect bone and wood to be preserved.

**Nash, Carole (Geographic Science, James Madison University)****[127]***We Can Be HeROs: Community-Based Mapping of Impacted Sites on Virginia's Eastern Shore*

Erosion from sea-level rise and subsidence are greatly impacting archaeological resources on Virginia's Eastern Shore, both on the Chesapeake Bay and Atlantic shores. At this point in time, vulnerability models indicate areas that may need the greatest attention from archaeologists, but these may not take into consideration the experience of those who live with sea-level rise impacts on a daily basis. Faculty and students developed the HeRO (Heritage Resource Observers) application to gather information on the vulnerable sites that are important to residents of in Northampton County, Virginia, to study the impacts of heritage loss on community identity. The app, which allows users to map sites, provides options for recording information about physical changes and their knowledge of its history. The goal of the project is to ground the discussion of climate change impacts in the users' experience, while gathering information on heritage resources that are quickly disappearing. As more users become familiar with the app, whose data are stored with the Virginia Department of Historic Resources, the project will expand to train users to record sites that are known to the larger community. This presentation shares examples of the HeRO stories gathered thus far.

**Nash, Carole (Geographic Science, James Madison University)****[127]***Chair***Nash, David (University of Brighton), Jake Ciborowski (University of Brighton), Sigrid Staurset (University of Oslo), Sheila Coulson (University of Oslo) and Sarah Mothulatsipi (University of Botswana)****[149]***Mapping Middle Stone Age Human Mobility in the Makgadikgadi Pans, Botswana, through Multi-site Geochemical Provenancing of Silcrete Artifacts*

Studies of the distance over which lithic tools and the materials used in their manufacture were transported form the foundation of our understanding of human movements through prehistoric landscapes. Here, we combine geochemical provenancing and *chaîne opératoire* analyses of silcrete assemblages at five open-air sites in the Makgadikgadi Pans, north-central Botswana, to reveal insights into resource procurement and transport strategies in the Middle Stone Age. At the largest site, tool production appears relatively wasteful, with large blocks, flakes and almost-perfect tools abandoned mid-production. Refitting shows surprisingly complete sequences, where most production stages are present. Combined, these results suggest abundant access to silcrete, meaning the toolmaking material is unlikely to have been transported over long distances. This hypothesis is supported by geochemical provenancing, which links silcrete artifacts from each site to outcrops within ~50 km. Previous provenancing research in silcrete-poor northwest Botswana has indicated that MSA peoples were highly mobile, selecting silcrete sources >220 km distant over closer outcrops. The contrast with the local procurement strategies adopted in the silcrete-rich Makgadikgadi implies that complementary landscape adaptation strategies were present in the Kalahari MSA, and that populations were flexible, capable of long-term planning, and familiar with resource availability in the wider environment.

**Nash, Donna (UNCG) and Andrew Roddick (McMaster University)****[87]***Crafting Social Identities with a "Unique Twist": A Return to Janusek's Style Research in the South-Central Andes*

Andean archaeologists have long challenged conventional models of social complexity. In this paper, we reflect on John Janusek's foundational work into the relationship between polities, social boundaries and archaeologically recognized styles. Janusek questioned material expressions of identity at Tiwanaku and conventional framings of the sociopolitical context of craft production (e.g., attached, independent, embedded). His analyses and comparison of assemblages from different residential compounds emphasized elements of conformity and "twists" on Tiwanaku style that indexed local corporate and "segmentary" units and foreign suprahousehold identity. While Janusek's later work foregrounded techniques and materials, he did not return to his work on style. In this paper we make such an effort, considering domestic production and style in Formative and Middle Horizon worlds in the south-central Andes. Drawing on archaeological and ethnographic data, we make a particular effort to consider the role of materials in the social boundaries of craft production outside of Tiwanaku.

**Nash, Donna (UNCG)****[194]***Discussant*

Nash, Donna [194] see Biwer, Matthew

Nash, Donna [162] see Witte, Emilee

**Nava, Alberto (UCSD), Alejandro Alvarez (CINDAQ), Roberto Chavez Arce (CINDAQ), Samuel Meacham (CINDAQ) and Helena Barba Meinecke (INAH)****[221]***Skeletons Recovery Technique for Deeper Underwater Caves*

The underwater caves of the Yucatán Peninsula are becoming an important field for Paleoamerican studies. Animal and human remains lie deep inside this hostile environment. Preferentially, these skeletons should remain in the cave, but it is sometimes necessary to recover them for study and analysis. Recovering these skeletons from water excess of 45 m and far from the cave entrance presents challenges and can be dangerous. In this paper we present a recovery technique that does not increase the speed of ascents from deeper portions of the caves, making the journey very controlled and reducing the risk to participating divers. The method uses a series of calibrated floats and lifting devices, which can be systematically selected until the object is neutrally buoyant. The floats do not expand and the lifting devices are only used at full capacity. During ascent the lifting devices

automatically vent the excess gas. With this system the speed of an ascent will not accelerate and the object can be extracted with great control. This approach has been tested at the Hoyo Negro pit, where we have used it to extract specimens ranging from <4 to more than 100 kg from depths up to 50 m.

Nava Blank, Alberto [221] see Arano Recio, Diana

**Navarro-Farr, Olivia (College of Wooster), Michelle Rich (Dallas Museum of Art), Keith Eppich (Tyler Junior College) and Griselda Perez (Universidad de San Carlos de Guatemala)**

[153]

*Researching the Past, Investing in the Present: Relationship Building and Community Engaged Scholarship in Parque Nacional Laguna del Tigre, Petén, Guatemala*

Alphawood Foundation support of the Proyecto Arqueológico (PAW) commenced in 2012, initiating a new phase of groundbreaking research. Their sustained funding of archaeology in the Reserva Biosfera Maya (RBM) also enables critical coalition building with partners like the Instituto Nacional de Antropología e Historia, the Dirección General del Patrimonio Cultural y Natural, Wildlife Conservation Society, the Consejo Nacional de Áreas Protegidas, and the US Department of the Interior. We have initiated community-based efforts with various communities including Dolores, Centro Campesino, El Jobo, and the Q'eqchi' community of Paso Caballos in Parque Nacional Laguna del Tigre, tethering our scholarly research to broader considerations of how our long-term presence in this region can yield meaningful returns for these communities with which we collaborate. As Guatemala's cultural patrimony becomes increasingly endangered by threats of privatization, environmental degradation, and the global narcotics trade, it has never been more important to maintain our foothold in the RBM. In this session, we celebrate the Alphawood Foundation of Chicago for 10 years of generous support, helping PAW pursue Community Engaged Scholarship.

Navarro-Farr, Olivia [188] see Rich, Michelle

**Navarro Sandoval, Fernanda (INAH Michoacán), Dante Martínez Vázquez, José Luis Punzo Díaz (INAH) and Angélica Pérez Diosdado (UNAM)**

[174]

*Living on the Edge: First Data of a Suburb of Tzintzuntzan*

Since 1937, when the first institutionalized fieldwork season took place in Tzintzuntzan, research has focused on the main space of monumental architecture in the ancient city, which corresponds to the Great Platform and the five Yácatas. Although exploratory work has also been done in other areas such as the Santa Ana and San Pablo platforms, as well as the "Volantín" cemetery, which despite being outside the main core, are still related to administrative political contexts. So, since the archaeological work began, domestic spaces, that would shed light on the rest of the activities that took place in the city, have never been excavated. In 2020, INAH Michoacán carried out salvage excavations due to a project involving construction of a new neighborhood on the slopes of Yahuarato hill, close to the community of Tzintzuntzita. The result of these excavations was the detection of a significant number of archaeological vestiges that for the first time provide us with data on the various activities that took place in a set of residential terraces outside political administrative areas. Among them an accumulation of lithic debris related to the manufacturing processes of obsidian earplugs, rocks with petroglyphs, and a burial.

Navarro Sandoval, Fernanda [174] see Punzo Díaz, José Luis

**Navas-Méndez, Ana (New College of Florida), Daniel Pierce (University of Missouri), Brandi MacDonald (University of Missouri), Michael Glascock (University of Missouri) and Mary Ownby (Desert Archaeology)**

[167]

*Communities of Practice during the Late Precolumbian Period (AD 700–1500) in the Gran Coclé and Gran Darién, Panama*

This paper critically discusses the use of stylistic approaches to explain the dispersion of ceramics with the same aesthetic to define archaeological cultures in Panama. It challenges the still-popular use of materiality to define a homogeneous and stable shared identity for the Isthmo-Colombian Area. Using the communities of practice and communities of consumption concepts, we suggest that the distribution of pottery was the result of practices related to production, exchange, and use of pottery, and not necessarily ethnic affiliation. This research is based on compositional and technological characterization of 117 ceramic samples through neutron activation analysis (NAA) and thin section analysis to identify the recipes people used in the Late Precolumbian period (AD 700–1500). Results show the different articulation of communities of potters and communities of consumption in Central and Eastern Panama. The analysis introduces more dynamic representations of the past by focusing on the value of consuming foreign pottery for culinary, ritual, and political events for different precolumbian groups.

**Navas-Méndez, Ana (New College of Florida)**

[167]

*Chair*

**Nayak, Ayushi (Max Planck Institute for the Science of Human History)**

[193]

*From the Land to the Body: Interpreting Multi-material Stable Isotope Data Using Integrative Indigenous Approaches*

The acknowledgement of archaeology and anthropology as colonial endeavors is fairly widespread, but their persistence under this framework continues to be a subject of debate in the fields. The "ethical turn" in archaeology in recent decades has been recognized as a postcolonial critique of a discipline turned reflexive. Yet, the colonial roots and the existing power structures in academia in the

Global North continue to determine how the discipline is practiced, taught, and disseminated. This ethical turn has also meant that terms borne out of struggle by marginalized and Global South scholars have often been repurposed as metaphors (Tuck and Yang 2012) than as a radical reexamination. This talk draws on the work of Indigenous theorists from settler and postcolonial settings to examine the different pathways to interpreting archaeological stable isotope datasets. By drawing on multi-material stable isotope data from early farming societies in South Asia, this paper illuminates the widespread and continued use of colonial frameworks, and the epistemicide within archaeology that arises from excluding Indigenous, critical theories about living and past peoples. I also hope to weigh the consequences of “decolonization” as a process within the GN against the fractured implications for archaeology in the GS.

**Nayak, Ayushi (Max Planck Institute for the Science of Human History)**

[214]

*Discussant*

Ndiema, Emmanuel [186] see Goldstein, Steven

Ndiema, Emmanuel [186] see Mueller, Natalie

**Ndour, Sidy (University Laval)**

[186]

*Impact of the Atlantic Expansion at Baol (ca. 1450–1900): The Case of Lambaye*

The arrival of Europeans on the West African coast in 1444 began a period of regular contact between northern Senegambia and Western Europe. According to historical Senegalese and Western sources, this contact favored the establishment of a “world economy” based on trade in European trafficking products with Senegambian trading products. This contact also gradually created social, political, and economic upheavals in the Senegambian kingdoms and favored the centralization of power in the Baol in the 1500s. Focusing on a multidisciplinary methodological approach, this paper examines the nature of the impact of Atlantic trade on population dynamics and on the process of political, cultural, social, and economic evolution of the Baol.

**Neeley, Michael (Montana State University) and Josh Chase (Bureau of Land Management)**

[66]

*Revisiting the Henry Smith Site: New Work at a Late Prehistoric Site in the Northwestern Plains*

The Henry Smith site (24PH794), a late prehistoric bison kill with associated drive lines, cairns, and effigy figures, first gained notoriety in the late 1970s with the seizure of illicitly obtained artifact collections from local artifact collectors. As part of the subsequent mitigation process, the Bureau of Land Management conducted limited testing and mapping of the site to assess the damage, remaining potential, and integrity of the site. Following a long hiatus, the BLM and Montana State University initiated renewed investigation of the site complex in 2016–2017. Early on, it became apparent that the site was even more extensive than originally reported and constituted an engineered landscape, with diverse feature types and activities intertwined across the landscape representing a long time span. This poster presents the results of the renewed work through the combined use of excavation, aerial survey, and mapping. Our results indicate a varied, complex, and repeated use of the landscape over the past 1,500 years.

Neff, Nadia [47] see Ray, Erin

Negrino, Fabio [61] see Gravel-Miguel, Claudine

**Neller, Angela (Wanapum Heritage Center, Grant County PUD)**

[180]

*Discussant*

Nelson, Ben [14] see Schwartz, Christopher

Nelson, Erin [12] see Peres, Tanya

**Nelson, Margaret (Arizona State University) and Patricia Gilman (University of Oklahoma)**

[118]

*Plants, People, and “Dr. Science”*

Archaeology is a social career, a team effort. Others impact our work and our careers; they teach us and learn from us. We are fortunate to have worked with Paul Minnis—“Dr. Science”—for well over 40 years. He has been the colleague who enthusiastically collaborates, shares, teaches, and learns. As a paleoethnobotanist and Mimbres and US-Mexico borderland specialist, Paul has conducted research that has impacted our field, and he has generously shared his time and talents with colleagues and young students. Today we will talk about Paul’s impact on the field, on the work of the Mimbres Foundation, and on us personally.

**Nelson, Peter (University of California, Berkeley)****[121]***Collaboration on the Central California Coast: A Perspective on the Impact of the Lightfoot School of Inclusive Research and Archaeological Pedagogy from 2010 to 2020*

Throughout the various projects led by Kent Lightfoot in the Central California Coastal Region, Lightfoot and his many students and collaborators have helped shape the relationship between tribes, archaeologists, and universities in this area. These projects have been co-designed with professors, graduate and undergraduate students, tribal communities, and public agencies to ensure that the research is inclusive and provides educational opportunities for students, tribal members/citizens, and volunteers. It has also produced high-quality outcomes and products with, by, and for these various participants in the research. As these projects have worked with different tribes, the methods were tailored to meet the needs and priorities of these communities. These methods included a suite of geophysical and other noninvasive or low impact strategies for archaeological prospection as well as excavation where merited. The UC Berkeley archaeological field school at Pinnacles National Park, the Historical Ecology and Archaeology of Landscapes at Point Reyes (HEALPR) Project at Point Reyes National Seashore, and UC Berkeley archaeological research along the Santa Cruz Coast will serve as examples of some similarities and differences in the collaborative process, methods, and outcomes of this multi-decadal research and educational program that has left its mark on the discipline.

**Nelson, Peter (University of California, Berkeley)****[121]***Chair*

Neme, Gustavo [47] see Gil, Adolfo

**Nesbitt, Jason (Tulane University)****[192]***Were There Secret Societies in the Initial Period?*

The Initial period on the Peruvian coast is characterized by numerous monumental platform and plaza complexes that functioned as temples. Increasing research of Initial period sites in Lurín, Casma, and Moche have shown that these massive, stepped platforms are associated with numerous smaller buildings that also probably functioned as religious structures. In this presentation, I compare these “secondary” buildings in terms of their size, placement, internal features, and artifact content. Based on this information, as well as a review of extant archaeological and ethnographic data from other parts of the Americas, I argue that the buildings functioned to house the ritual activities of secret societies. This conclusion has important implications for understanding the kinds of social and religious organization behind the construction of early Peruvian temples.

Nesbitt, Jason [88] see Johnson, Rachel

Nesbitt, Jason [129] see Tsurumi, Eisei

Nesbitt, Jason [157] see Washburn, Eden

**Neubauer, Fernanda (University of California, Los Angeles; University of Wisconsin–Madison)****[140]***Indigenous Perspectives on Territoriality: Multivocal Research for Land Repatriation in Collaboration with Native American Communities*

This paper discusses archaeological research on a long-term project in collaboration with Guarani communities toward Indigenous land repatriation in Brazil. The project's fieldwork and meetings were carried out with the participation of the Indigenous people and, during the research, their memory, oral traditions, perspectives, and interpretations were incorporated into the reports produced. Guarani resilience is presented here through a discussion of their sociopolitical struggle for land, survival, recognition, and Indigenous rights. Disruption and aggression toward Guarani communities is a long-established phenomenon, and space-based violence and the oppression of indigeneity continues to be a significant, ongoing reality. Due to the pressures of colonialism, the Guarani are forced to occupy marginal territories that lack many of their most critical resources, and for the majority of them, roadside encampments are the only available space to live. During fieldwork, the Guarani identified several flora used for medicine, many of which they currently have no access to. The Guarani also identified examples of plants, animals, deities and other cosmological beings, demonstrating the strong and inseparable relationship that they trace between their bodies/people and these sacred landscapes, which are essential to the continuity and maintenance of their Nandé Rekó (the way of being Guarani).

**Neubauer, Fernanda (University of California, Los Angeles; University of Wisconsin-Madison)****[140]***Chair***Neusius, Sarah (Indiana University of PA, Emeritus)****[36]***Discussant***Neves, Eduardo (University of São Paulo)****[124]***Discussant*

Neves, Eduardo [63] see Pugliese, Francisco

**Newell, Savannah (Edward Via College of Osteopathic Medicine)**

[89]

*Investigating Consumption: A Case Study of Tobacco Use in the Lower Illinois River Valley*

The Schild site was a large multicomponent site located in the Lower Illinois River Valley. Individual S1-24a is a young adult female from the Late Woodland component (approximately 1500–1000 BP) of the site. Analyses using liquid chromatography tandem mass spectrometry detected a substantial amount of nicotine within her bone matrix. S1-24a's rib sample generated 77.45 nanograms (ng) of nicotine per sampled grams (g) of bone. In comparison, the total mean for Schild individuals was 11.56 ng/g. This paper presents possible explanations for the large amount of nicotine recovered from S1-24a. Her prone burial may indicate that she was an outsider and that the amount of recovered nicotine was the result of different tobacco consumption practices by different communities. Another possible explanation is that the amount of nicotine recovered was the result of a different method of consumption (i.e., chewing, topical application, smoking). S1-24a may have been involved in the harvesting of tobacco leaves as such practices can result in tobacco absorption via the skin. Alternatively, she may have intensively consumed tobacco specifically for healing purposes, as ancient DNA and skeletal analysis suggests she had tuberculosis.

Newell, Zachary [116] see Waters, Michael

**Newland, Michael and Alex DeGeorgey (Alta Archaeological Consulting)**

[127]

*The Voice of Water: Talking Archaeology and Climate Change in the Golden State*

California is on the front lines from the impacts of climate change. Catastrophic fires, drought, and coastal erosion threaten the state's cultural heritage. Archaeology is being used in new ways to help recover from these impacts, and to build resiliency going forward. Recent cultural resource legislation has given the Tribal community greater say over what happens to their cultural heritage, and as large infrastructure projects loom to build resiliency for climate change and to accommodate continuing development in the state, Tribes, agencies, and archaeologists are engaged in finding a common language for discussing the best way forward, in terms of physical, cultural, and spiritual impacts to resources. The state's archaeological society continues to move forward with inventorying the state's coastal heritage before it is gone. This paper will look at new roles for archaeology, specifically an updated overview of cremains recoveries from catastrophic fire events—as well as the role that archaeologists are playing in mapping out the impacts to sites and working with Tribes to find consensus about how best to protect the natural and cultural resources of our shared home.

**Newlander, Khori (Kutztown University) and Laura Zacharias (Kutztown University)**

[149]

*Inferring Mode of Acquisition from Toolstone Conveyance: A Pesky Middle-Range Problem*

Inferring mode of acquisition from toolstone conveyance is a long-standing middle-range problem. Given archaeologists' reliance on patterns of toolstone conveyance to understand how prehistoric populations organized themselves in relation to their landscape, its resources, and each other, resolution of this problem would be significant. Drawing on research in the North American Great Basin and Middle Atlantic, we argue that the concepts archaeologists often use to derive insight into landscape use and sociocultural organization from patterns of toolstone conveyance (e.g., embedded procurement, residential vs. logistical mobility), as well as their material correlates, warrant greater scrutiny. We offer some ideas that might help us make headway on the linkage problem we confront when attempting to infer mode of acquisition from patterns of toolstone conveyance.

Newlander, Khori [39] see Carroll, Amber

Newlander, Khori [39] see Roberts, Tyler

Newlander, Khori [114] see Zacharias, Laura

**Nicholas, George (Simon Fraser University)**

[195]

*Moderator*

**Nichols, Deborah**

[133]

*Discussant*

Nichols, Teresa [159] see Sievert, April

**Nicholson, Christopher (Center for Digital Antiquity)**

[36]

*Moderator*

[36]

*Discussant*

Nicola, Sharratt [129] see Marsh, Erik

**Nicolas Lorenzo, Dennis (University of Yamagata)**

[74]

*Morro de Eten: Una aproximación sobre su cronología e implicancias socioculturales en el formativo medio y tardío del norte peruano*

Investigaciones sobre el periodo formativo en el norte peruano, consideran a Morro de Eten como un asentamiento vinculado al formativo tardío, donde se corresponde con las manifestaciones culturales del Cupisnique tardío y la esfera de interacción Chavín. Sin embargo, a partir de un nuevo análisis del material cultural de Morro de Eten, en este estudio, se pone en reconsideración su cronología e implicancias socioculturales en el norte del Perú. Se establecen dos fases de ocupación vinculadas al formativo medio 1200-800 aC y tardío 800-550 aC y en el contexto social, se identifican procesos de continuidad cultural autónoma, vinculados a las tradiciones formativas del valle de Lambayeque. De este modo, a manera de hipótesis se concluye desde la perspectiva de Morro de Eten, que el formativo medio y tardío en el norte peruano se caracteriza por procesos sociales heterogéneos e interrelacionados.

**Nicolay, Scott (University of California, Merced)**

[86]

*Taking the Serpent by the Horns: Reconsidering Quetzalcoatl in the Southwest/Northwest*

Horned serpents appear in the iconography of many prehistoric cultures around the world, and they figure prominently in the archaeological record of the US Southwest and Northwest Mexico. Elaborate horned serpent images begin to appear in the Southern Mogollon region during the eleventh century, primarily on Mimbres Classic ceramics and in Jornada rock art. Sometime after 1250 CE, horned serpents emerge as an important motif in both the Casas Grandes and Salado interaction spheres, culminating in a spectacular and unique horned serpent effigy mound at Paquimé, and these figures continue through the ethnographic present in both the western and eastern Pueblos. Horned serpents also hold prominent positions in the living traditions of several Indigenous groups. Although archaeologists have long identified horned serpents in the SW/NW as northern representations of the Mesoamerican deity Quetzalcoatl, this association has received little scrutiny, despite significant differences in both the outward form of the depictions and the cosmological attributes of these entities in Indigenous belief systems. This paper questions the identification of the horned serpents in the SW/NW as Quetzalcoatl, and considers its origins in either Caddoan traditions to the east, or most likely, the poorly understood horned serpent tradition of West Mexico.

**Nicolay, Scott (University of California, Merced)**

[86]

*Chair*

**Nicosia, Christopher (Louisiana State University (LSU))**

[113]

*Preliminary Results of the Spatial Analysis of Nonspecific Stress in Three Regions of Ancient North America*

The emerging subfield of spatial paleopathological subfield in bioarchaeology is responding to calls for wider comparative studies of regions with diverse physical and social environments and, as a result, varying disease patterns. Although paleopathological research in the United States has addressed a variety of questions about nonspecific stress (e.g., cribra orbitalia, porotic hyperostosis), such as connections to dietary patterns, violent episodes, colonization and resistance, and cultural changes, it only scratches the surface of the underlying geographic contexts. This poster offers a preliminary spatial paleopathological analysis that tracks changes in nonspecific etiologies in relation to physical geography and sociocultural landscapes over time. I sample prehistoric and early historic archaeological sites in the Southeast, Midwest, and Southwest geographic regions of North America and discuss the Archaic (8000–500 BC), Woodland (500 BC–AD 1100), Mississippian (AD 1100–1541), and historic (AD 1541–1750) periods. Hot spot analysis, multiple regression models of geographic and environmental variables, and spatial analysis of etiologies are among the spatial paleopathological methods used to investigate relationships between how changing physical (e.g., elevations, geographic locations, climate changes) and sociocultural environments impact nonspecific stress trends. I look at growth, dietary, and nutritional data to infer nonspecific stress distributions and health risk factors.

**Nielsen, Michael (Ilisimatuseq University of Greenland), Christian Koch Madsen (Greenland National Museum and Archives), Aka Bendtsen (Greenland National Museum and Archives), Birte Olsen (Greenland National Museum and Archives) and Thomas McGovern (CUNY, Hunter College)**

[114]

*Thule Culture in South Greenland 1500–1900*

In collaboration with the NABO RESPONSE and Activating Arctic Heritage teams, Nunatta Katersugaasivia Allagaateqarfialu (the Greenland National Museum and Archives) intensively surveyed the Uunartoq Fjord, Igaliko Fjord, and Tunilliarfik Fjord systems in South Greenland. The goal was to establish knowledge on the cultural landscape between AD 1500 and 1900 and the preservation of cultural remains. The methods have been to survey and record new Thule settlements and excavate small test trenches in middens to establish knowledge of the economy through analysis of the faunal material, and to interview the local populations about their knowledge of the past and present use of the cultural landscape. This project is led by Christian K. Madsen (Greenland National Museum and Archives) and is part of two international cross-disciplinary collaborative projects involving the University of Greenland, National Museum of Denmark, Memorial University of Newfoundland, University of Iceland, University of Bergen, University of Edinburgh, University of Glasgow, and the University of Stirling. This poster presentation will present preliminary data and outline the methods, goals, and deliverables of the project.

Nielsen, Michael [33] see Madsen, Christian  
 Nielsen, Michael [33] see Simonsen Bendtsen, Aka

Niemann, Jonas [19] see Schroeder, Hannes

**Nieves Colon, Maria (University of Minnesota Twin Cities)**

[19]

*Advances and Challenges in Caribbean Paleogenomics Research*

The Caribbean islands have a complex population history characterized by continuous migration and demographic change. In the last 20 years, genetic approaches have transformed our understanding of the Caribbean precolonial period and revisited major debates in Caribbean archaeology, such as those surrounding the peopling of the Antilles and the relationship between ancient Indigenous communities and present-day islanders. In this presentation I will summarize the major contributions of ancient DNA research for Caribbean archaeology to date and highlight areas of future inquiry that would benefit from the integration of ancient DNA and bioarchaeological approaches. I will also discuss some of the challenges of conducting paleogenomics research in the Antilles. These include poor molecular preservation; lack of clear guidelines for community consultation, permitting and reporting of results; the need to strengthen local research capacities and involve local stakeholders; concerns about destructive analysis of ancestral remains—a nonrenewable and culturally significant resource; and the legacy of colonialism in Caribbean heritage resource management. This discussion will emphasize ways in which anthropological geneticists and archaeologists can work together toward a sustainable and ethical practice of Caribbean paleogenomics in the future.

Nikitina, Daria [127] see Wholey, Heather

**Niles, Erin, Suzan Jantz (Kleinfelder), Sarah Foley (Kleinfelder), Cameron Felt (Kleinfelder) and Kathleen Forrest (PG&E)**

[66]

*Fire Management and Archaeology: A Case Study on the Impacts to Cultural Resources from the North Complex Fire of 2020, Plumas and Butte Counties, California*

California's fire season is getting longer and more intense with each passing year, and fire response work has become a year-round focus for cultural resources management (CRM) archaeologists. The year 2020 had the largest fire season to date and included five of the largest fires recorded in California's history. With no signs of future abatement in fire intensity, it is clear that fire response work will remain an integral part of Californian archaeology. This case study analyzes the impacts to cultural resources from fire damage and fire management strategies resulting from the North Complex Fire. These data are a result of the emergency fire response and rebuild work performed by Kleinfelder archaeologists from 2020 through 2021 within over 70 cultural sites on behalf of Pacific Gas & Electric Company (PG&E) and aims to offer insight into future CRM work in the wake of California wildfires.

Nina Vargas, Hortensia [124] see Calla Maldonado, Sergio

**Niquette, Richard (University of Kansas) and Rolfe Mandel (Kansas Geological Survey)**

[202]

*Stratigraphy and Site Formation at San Esteban Rockshelter in the Big Bend Region of Southwest Texas*

San Esteban Rockshelter (41PS20) in southwest Texas has been the focus of intensive excavation over the past three years. The combination of a large shelter with a spring-fed tinaja and nearby stream made San Esteban an attractive location for people living in the Chihuahuan Desert. Excavation revealed human occupation spanning the Holocene, presenting a rare opportunity to explore questions of the early peoples of the Big Bend region. That opportunity, however, depends on the integrity of the cultural deposits. Hence, a detailed investigation of site stratigraphy and formation was conducted. Complex natural and anthropogenic processes in conjunction with nearly a century of looting have heavily affected the stratigraphic integrity of the site. Here, we present initial results of geoarchaeological investigations at San Esteban. While processes such as looting, bioturbation, impacturbation, and cultural reworking of deposits are significant destructive factors in some parts of the site, much of the stratigraphic record is remarkably intact.

**Niquette, Richard (University of Kansas)**

[202]

*Chair*

**Nissen, Zachary (Northwestern University)**

[210]

*Investigating Commoner Households at the Ancient Maya City of Aventura, Belize*

Since the 1980s, studies of households have dramatically transformed the discipline of anthropological archaeology. These studies have shown how domestic activities, particularly those of commoners, are reciprocally impacted by and work to drive socioeconomic systems. While commoner studies in the Maya area have become synonymous with studies of rural and hinterland sites, my research shows how methods of identifying and investigating commoner households can be used to study low-status households within the urban community of Aventura, Belize. Located in the Corozal District of Belize, the ancient urban center of Aventura was a heterogeneous community with a long-term occupation. In this paper, I present data from excavations of urban commoner households to assess issues of inequality and community at the site. I argue that despite having unequal access to construction

materials and labor, urban commoners were still integrated into the city's long-distance trade networks, as well as a community social network forged through shared ritual practices of ancestor veneration. By examining urban commoner households at Aventura, I illustrate how the specialized functioning and economies of cities may be built on systems of inequality, while at the same time, offer low-status households the opportunity to directly access diverse economic and social networks.

**Nocerino, Eric, Karin Pitts-Olmedo (Applied EarthWorks Inc.), Clayton Lebow (Applied EarthWorks Inc.) and Michelle Wienhold (Applied EarthWorks Inc.)**

[24]

*Archaeological Studies in 2019–2020 Supporting Section 106 Compliance for the Firebreaks and Access Roads Maintenance Program, Vandenberg Space Force Base, Santa Barbara County, California*

Concerns for wildfire across Vandenberg Space Force Base (Vandenberg SFB) have resulted in an extensive system of about 54 miles of firebreaks and 192 miles of associated roads. Many of these firebreaks and access roads are maintained on an annual basis. There are more than 1,600 archaeological resources on Vandenberg SFB. Firebreaks and access roads coincide with archaeological resources in 170 locations. Maintenance of firebreaks and access roads is an undertaking subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. To support Section 106 compliance and augment work previously completed, the Vandenberg SFB retained Argonne National Laboratory to complete a study of 15 archaeological sites that are associated with firebreak maintenance. Argonne National Laboratory retained Applied EarthWorks Inc. to perform the study. This presentation highlights the results of the archaeological investigations and the methods used to achieve Section 106 compliance.

Nocerino, Eric [24] see Wienhold, Michelle

**Noe, Sarah, Amber VanDerwarker (University of California, Santa Barbara) and Gregory Wilson (University of California, Santa Barbara)**

[8]

*An Examination of Shifting Foodways during the Twelfth and Thirteenth Centuries in the Central Illinois River Valley*

Archaeological research in the Central Illinois River Valley (CIRV) throughout the past decade has greatly expanded our knowledge of Early Mississippian lifeways, diet, and agriculture. Toward the end of this period, the region witnessed the establishment of palisaded villages and the beginnings of interregional hostilities. This paper examines changes in Early Mississippian diet at two sequential sites: Lamb (1100–1150 CE) and C. W. Cooper (early 1200s CE) with recent AMS dates situating the occupation of Cooper with the very beginnings of regional hostilities. In this presentation, we examine the faunal data alongside previously analyzed botanical data to better assess how lower plant foraging mobility articulates with hunting practices during this important transition.

**Nolan, Kevin (Applied Anthropology Laboratories), Mike Shott (University of Akron) and Eric Olson (Cuyahoga Community College)**

[83]

*Point Types as Subjects Using Big Datasets from Southern Ohio*

Which point types are more or less abundant per unit time? Do types replace one another or morph from one to another? Do they vary in degree of standardization or in degree of curation by reduction? North American archaeologists rarely pose such questions despite the staggering abundance of points here. Big datasets might help answer these unusual questions, but nonprofessionals possess the largest samples. Our collaborative project with nonprofessionals in southern Ohio documented >5,000 points. We collected 2D landmark data on about 3,000, 3D data on about 250. In its own small way, geometric morphometric analysis of this big dataset begins to answer nontraditional questions like these.

**Nolan, Kevin (Applied Anthropology Laboratories)**

[196]

*Discussant*

[196]

*Chair*

Nolan, Kevin [113] see Thompson, Christine

**Noldner, Lara (University of Iowa Office of the State Archaeologist) and Jennifer Mack (University of Iowa Office of the State Archaeologist)**

[52]

*Mill Creek Mortuary Practice: The View from 13PM7*

Levee failure caused by flooding of the Big Sioux River in the spring of 2019 resulted in the scouring of Mill Creek Village Site 13PM7 and significant exposure and redistribution of all subsurface features, including mortuary components. A local farmer's report of exposed ancient human remains to the University of Iowa Office of the State Archaeologist was what spurred all the work highlighted in this session. A minimum of five individuals' remains were documented that mainly originated from one feature. In consultation with the Mandan, Hidatsa and Arikara Nation (Three Affiliated Tribes), this presentation will summarize what can be reconstructed of this mortuary feature and mortuary practices evident at 13PM7 in relation to other Mill Creek sites in the region. The significant impacts of more frequent flooding events to cultural resources and preservation challenges for all stakeholders will also be highlighted.

Nondédéo, Philippe [11] see Hiquet, Julien

**Norman, Scotti (Wake Forest University)**

[49]

*Relocating Revitalization: The Changing Landscape of an Anti-Catholic Counterpublic in Sixteenth-Century Highland Peru*

Taki Onqoy (Quechua: “dancing/singing sickness”) was a sixteenth-century Andean religious revitalization movement against Spanish culture and the forced conversion to Catholicism. Taki Onqoy participants rejected Catholicism in favor of a return to pre-conquest huaca veneration and performed elaborate rituals grounded in spirit possession during which they fasted, ritually drank alcohol, wore red face paints, sacrificed llamas or cuy, and chanted and danced frenetically in a trancelike state. Taki Onqoy adherents thus created a dynamic and shifting counterpublic in relation to both Catholic authorities and Andean peoples who supported Catholicism or feared participation in the new religious sect. As the movement developed and matured, the physical spaces of performance shifted from mountain peaks to specially constructed outdoor structures in towns and finally, as Catholic authorities began to punish those they viewed as anti-Catholic, to domestic family households. In transforming the locations of these rituals, Taki Onqoy adepts also shaped who had access to them and how visible they were to a general public. The Taki Onqoy movement thus generated several “in-between” overlapping communities of Andeans who could flexibly (and often covertly) participate in the rituals while simultaneously maintaining a guise of adherence to new Spanish policy.

**Norman, Scotti (Wake Forest University)**

[49]

*Chair*

Norred, Ashley [24] see Wurtz Penton, Michelle

Novak, Mario [193] see Toyne, Jennifer Marla

**Novotny, Claire (Kenyon College)**

[165]

*Discussant*

**Nowak, Isabel (Davidson College) and Maxime Lamoureux-St-Hilaire (Davidson College)**

[161]

*Historical and Community Archaeology: The Enslaved of Beaver Dam*

The project “Historical and Community Archaeology: the Enslaved of Beaver Dam” researches the erased past of the enslaved population who labored on the former Beaver Dam plantation (Davidson, NC) in the nineteenth century. This poster presents evidence from archival and GIS data and from multiple pedestrian surveys that support the identification of the locations for the living quarters and for a cemetery used by the enslaved at Beaver Dam. Since the small estate which remains from this former plantation is owned by Davidson College, the results of this investigation have implications for the college’s history and landscape. This poster also addresses the future of this project, which can only be centered on a community-based participatory research program. Our preliminary results highlight the strong potential for this project to contribute to the field of African diaspora archaeology in the greater Charlotte area. Importantly, this project attracts attention to key dimensions of the racially conflictual cultural heritage of this landmark, which is otherwise only known for the historical plantation house sitting on its premises.

**Nowell, April (University of Victoria) and Jennifer French (University of Liverpool)**

[17]

*Growing Up Gravettian*

Adolescence is a stage of development unique to the human life course, during which key social, physical, and cognitive milestones are reached. Nonetheless, both the experience of adolescence and the role(s) of adolescents in the past have received little scholarly attention. Here we combine a broad interpretative framework for adolescence among prehistoric hunter-gatherers with direct bioarchaeological (burial) data to examine the lives of teenagers in the European Mid-Upper Paleolithic or Gravettian (~35–25,000 years ago). Within long-standing models of a distinct, continent-wide European Mid-Upper Paleolithic funerary tradition, comparisons of the burial practices of individuals of different age classes (infant, child, adolescent, adult), as well as between adolescents who died at different ages, reveal some notable patterns related to adolescence in these communities, including (1) fewer distinctions based on sex among adolescents compared to adults; (2) differences between the sexes in age-at-death within our “adolescent” age class—with females disproportionately dying later—potentially indicating high risks associated with first pregnancy; and (3) distinctions in grave goods and diet among adolescents of different ages-at-death at Sungir, Russia, which we tentatively interpret as providing an emic perspective on the beginning of adolescence as defined by Pleistocene hunter-gatherers.

Núñez Aparcana, Bryan [190] see Dalton, Jordan

**Núñez-Cortés, Yajaira (Instituto de Investigaciones Antropológicas, UNAM), Luis Barba-Pingarrón (Instituto de Investigaciones Antropológicas, UNAM) and Jorge Ezra Cruz (Instituto de Investigaciones Antropológicas, UNAM)**  
[125]

*Approaching Culinary Practices at Lomas Entierros, Costa Rica: A Perspective from Chemical Residue and Starch Grain Analyses*  
Lomas Entierros is a primary settlement in Central Pacific Costa Rica and an important node for interregional exchange during AD 800–1200. Material evidence of wealth differentiation indicates that elites controlled access to certain types of imported ceramics and most of the lithic production, intermediate status groups were relatively autonomous crafters with access to important amounts of wealth, while low status people only had access to lower value imported materials. In this paper we explore and compare culinary practices and social and economic uses of food in all sectors of society through the study of chemical residue (spot test for carbohydrates, pH, protein, carbonates, fatty acids, phosphates) and starch-grain analyses in structure floors of elite and intermediate sectors, and chemical residues on ceramic vessels from elite, intermediate and low status areas. Chemical residues and starch-grain, coupled with macro- and micro-residue on floors, suggest differential activities in high and intermediate structures associated with processing and consumption of food. Starch grain from sampled areas with rich carbohydrate presence in the structures' floor, provide further evidence of the cultigens and resources utilized in such contexts. Chemical residues in ceramics suggest differential access to foods in high, intermediate, and low status contexts.

**Núñez-Cortés, Yajaira (Instituto de Investigaciones Antropológicas, UNAM)**  
[125]

*Chair*

Núñez-Parker, Francisco [39] see Russ, Jon

**Nusbaum, Katharine (Binghamton University)**  
[159]

*Challenges to Integrating Archaeology into K–12 Education: A Survey of New York Educators*  
There are a plethora of challenges to bridging the divide between K–12 education and archaeology. The goals of this paper are to identify these challenges in New York state in an effort to begin to overcome them. Over 300 teachers and administrators from public K–12 schools were surveyed for their input on using archaeology in the classroom. The responses ranged from all grade levels and types of classrooms and reflected many of the perpetual problems that archaeologists in public education have previously noted: the difficulty of aligning with state standards; fitting new material into tightly packed curricula; the lack of training and background knowledge on the part of the teachers; and access to both archaeological and educational material for the classroom. The educators' responses also demonstrated a misunderstanding of how archaeology can be used across different subjects, indicating a lack of awareness of archaeology's interdisciplinary nature and grounding in STEM. These findings point to a prevalent misconception of the discipline. Despite these challenges, the respondents largely displayed an eagerness to use archaeology in the classroom. Above all, this research highlights the need for the archaeological community to take a larger role in integrating our research into K–12 education.

Nyárádi, Zsolt [71] see Bethard, Jonathan  
Nyárádi, Zsolt [71] see Zejdlik, Katie

Nygaard, Travis [59] see Spencer, Kaylee

**Oas, Sarah (Arizona State University) and Samantha Fladd (University of Colorado Boulder)**  
[152]

*Complementary and Contradictory: Examining Gender Identities through the Lens of Food Preparation in Chacoan History*  
Recent work on the relationship between Chaco Canyon and outlier communities highlights localized responses to the overarching ideological structure associated with the canyon itself. However, the implications of these relationships on individuals within outlying communities remains underexplored, particularly when considering the role of women. The two main arguments about women's place in Chaco society within the Canyon—as either captive labor or important ritual practitioners—rely on similar evidence about mealing spaces used for grinding maize and other food preparation. Mealing features and groundstone technologies offer unique insights into social organization and multiple layers of social identity including gender and communities of practice. In this paper we consider archaeological evidence for the architectural histories of these important but often overlooked spaces and activities both within Chaco Canyon and at outlier communities in the Central Mesa Verde and Cibola regions. Our diachronic analysis will consider how localized interpretations of Chacoan ideologies affected the role of women within later communities.

Oas, Sarah [49] see Fladd, Samantha  
Oas, Sarah [141] see Young, Lisa

**O'Briant, Kevin (University of Montana School of Extended & Lifelong Learning)**  
[102]

*From Object to Subject: Symmetrical Archaeology and Materialized Memory on the Northern Plains*  
The “New Materiality” and the ontological “turn to things” in archaeology offers a tantalizing theoretical framework to better understand how objects like rock art sites, ceremonial bundles, and sacred places on the Northern Plains can be better understood and interpreted as nonhuman subjects with reciprocal relationships with human actors on the landscape. Attempts to interpret the

intent of the maker or “original meaning” of rock art overlooks the primacy of the relationship between these things and the people with whom they relate. As nonhuman subjects, they are capable of renewal and dialogue with both present and future interlocutors, and their “meaning” is not fixed but contingent and provisional.

**O'Briant, Kevin (University of Montana School of Extended & Lifelong Learning)**

[102]

*Chair*

O'Brien, Matthew [97] see Mackie, Madeline

**O'Brien, Michael (Texas A&M–San Antonio), Briggs Buchanan (University of Tulsa) and Mark Collard (Simon Fraser University)**

[57]

*Goshen and Plainview*

Recent work has demonstrated that Goshen points overlap in time with another group of unfluted lanceolate points from the Plains, Plainview points. This has raised the question of whether the two types should be kept separate or consolidated into a single type. We sought to resolve this issue by applying geometric morphometric methods to a sample of points from well-documented Goshen and Plainview assemblages. We found that their shapes were statistically indistinguishable, which indicates that Goshen and Plainview points should be assigned to the same type. Because Plainview points were recognized before Goshen points, it is the latter type name that should be dropped. Sinking Goshen into Plainview allows us to move beyond taxonomic issues and toward understanding both the spatiotemporal variation that exists among Plainview assemblages and what it can tell us about the adaptations and social dynamics of Plainview groups.

**O'Brien, Michael (Texas A&M–San Antonio)**

[57]

*Chair*

Ocana, Carolina [85] see Mathwich, Nicole

**O'Carroll, Finola (Blackfriary Archaeology Field School)**

[42]

*The Community of the Faithful*

The Dominican Friary in Trim, founded ca. 1263, is located just outside the northern town boundary, a peripheral location that is fairly typical of Dominican friaries in Ireland and elsewhere. The Dominicans were mendicants and dependent on the charity of their host community for their daily subsistence and much more. Did such a location facilitate the ready interaction of the friars with the two communities, Anglo-Norman and Gaelic Irish, the town dwellers and the folk of the countryside? Before the coming of the Normans coinage was not widely used, and we see in the practice of questing for alms a system of mutual credit in operation. The friars promised spiritual solace, not just in the here and now but in the hereafter through masses and prayers and the provision of funeral rites, in exchange for the necessities of life. Documents of the period give a glimpse into the gifts and donations made by wealthier patrons, sometimes of cash, but often of goods—candles, altar vessels, and even buildings. How would this system of mutual dependence have formed and shaped the social relationships between the two communities, Anglo-Norman and Gaelic Irish, and the Dominicans?

Ocas Q., Andrés [103] see Benfer, Bob

**O'Connor, Sue (Australian National University), Shimona Kealy (Australian National University), Ceri Shipton (University College London) and Julien Louys (University of Griffith)**

[120]

*Human Colonization of the Wallacean Islands: When, Where, and How?*

The islands of Wallacea are biogeographically unique as they have never been connected to mainland continental Sunda or Sahul, and as such reaching them has always required dispersal over water. This is the case for plants, animals, and people. Non-modern hominins reached the islands of Wallacea by ~1 million years ago, however, their maritime dispersal was limited to the larger islands of the Philippines, Flores, and Sulawesi. Modern humans, in contrast, colonized the entire Wallacean archipelago of over 10,000 islands, beginning at least 45,000 years ago. Settlement of many of the smaller and more distant Wallacean islands was probably episodic and required specialized maritime adaptations and technology. Here we discuss the evidence pertaining to these discrete colonization scenarios, what factors may have precluded onward migration by non-modern hominins, and factors that enabled *Homo sapiens* to reach Sahul and expand throughout the Wallacean archipelago.

O'Corry-Crowe, Greg [111] see Vianello, Andrea

**Odess, Daniel (National Park Service), Vance Holliday (University of Arizona), Thomas Urban (Cornell University), Matthew Bennett (Bournemouth University) and David Bustos (National Park Service)**

**[184]**

*Some Implications of Recent Discoveries at White Sands National Park*

Recent dating of human tracks at White Sands National Park has broad implications for several important topics related to early human presence in the Americas. Among the ones we discuss here are the route(s) by which people arrived, the Overkill Hypothesis, and possible antecedents in Asia.

**Odess, Daniel (National Park Service)**

**[184]**

*Chair*

Odess, Daniel [184] see Bustos, David

Odess, Daniel [184] see Urban, Thomas

O'Donnell, Sarah [15] see Holland-Lulewicz, Jacob

Oelze, Vicky [23] see Ingleman, David

Oelze, Vicky [157] see Washburn, Eden

Oestmo, Simen [90] see Murray, John

**Ogburn, Dennis (University of North Carolina at Charlotte)**

**[129]**

*Improving the Chronology of Inka Imperial Expansion*

It has been recognized for more than two decades that the traditional chronology of Inka imperial expansion needs to be overhauled. The emerging set of radiocarbon dates produced from Inka provincial sites shows that the chronology John Rowe proposed based on the chronicle of Cabello Balboa is no longer viable. The accuracy and precision of radiocarbon dating has improved such that we have begun establishing a better picture of when the Inka conquered different regions, and Bayesian modeling helps to further refine the chronology. Archaeologists working at provincial sites need to be careful in selecting the appropriate contexts to determine the timing of Inka incorporation, and we need more dates from sites in the Inka heartland around Cusco to understand the timing of initial imperial expansion. Dates from Ecuador, Peru, Bolivia, Chile, and Argentina will be reviewed to present a tentative sequence of Inka expansion and point to gaps in the data and challenges we still face in using radiocarbon dating and other techniques to improve the chronology.

**Ogden, Brigid (University of Tennessee Knoxville) and Anneke Janzen (University of Tennessee, Knoxville)**

**[203]**

*"Exceeding Ill-Husbandry": A Stable Isotope Analysis of Livestock Management Strategies in Seventeenth- and Eighteenth-Century Virginia*

Over the course of British settlement in the Chesapeake region of Virginia, colonists were challenged to adapt European farming and husbandry practices to suit the environment of North America. Throughout the seventeenth and eighteenth centuries, colonial occupants of Virginia continually shifted their land and animal management strategies as new practices and technologies emerged. In this paper, we apply stable isotope ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ) analysis to archaeological livestock, including cattle (*Bos taurus*), pigs (*Sus scrofa*), and sheep (*Ovis aries*) from the Utopia Quarter Site (ca. AD 1670–1770) in Virginia to assess the potential of using isotopic analysis to infer the timing of agricultural changes and their impact on livestock management at Utopia. The results indicate that livestock management at the Utopia Quarter remained a dynamic practice over its century-long occupation. Notably, sheep present with isotopic values that indicate the existence of a species-specific management strategy involving the exploitation of specific environmental niches separate from those utilized for other taxa. Together, these trends help clarify the nature of the relationships operating between humans, their livestock, and the environment in colonial Virginia.

Ogden, Brigid [203] see Burge, Keri

**Ogundiran, Akin (UNC Charlotte), Olusegun Moyib (University of Ibadan) and Jonathan Aleru (University of Ibadan)**

**[106]**

*Àjògbé and Àjòbí: Archaeology of Household Organization in the Metropolis of the Oyo Empire (1570–1840)*

The political authorities of the Oyo Empire (1570–1840) employed a wide range of strategies to control the empire's diverse populations. These strategies included dismantling, reorganizing, and redefining kinship and household relationships across the vast area of the empire. I argue that the state created many household configurations for effective governance, labor organization, and sustenance of the unequal power structure. This paper will examine aspects of these household configurations in the metropolis of the Oyo Empire based on the recent excavations of two residential structures: MJR1—an impluvium-courtyard residence in Oyo-Ile (the capital), and S600W250—a barrack-style residence in Bara (a suburb town of the capital). Both residential structures were palace-affiliated. Focusing on the spatial arrangements of domestic artifacts in general, and ceramic functions in particular, the paper will answer questions about the household organization and the dynamics of kinship (àjòbí), co-residency (àjògbé), social class, dependency, and labor management in Oyo palace administration. This paper will be the first of the results emanating from

the ongoing study of household archaeology and political economy in the Oyo Empire. It will contribute to the archaeology of empires, with the unique insights of Africa-based household materialities and indigenous epistemology.

**Ogundiran, Akin (UNC Charlotte)**

[106]

Chair

Ohnstad, Arik [87] see Zovar, Jennifer

Ojeda R., Bernardino [103] see Benfer, Bob

O'Leary, Beth [64] see Holcomb, Justin

**O'Leary, Matthew (Syracuse University) and Christopher DeCorse (Syracuse University)**

[106]

*Marketing Empire: Smoking, Pipes, and Cultural Entanglement in Colonial Senegal*

This paper examines tobacco pipes within the context of expanding European industrial capitalism and colonization in late nineteenth and early twentieth century West Africa. With the passage of abolition legislation, European governments and entrepreneurs pursued new ways to profit from their African ventures. This included a variety of legislative policies that sought to secure revenue and laid the foundation for colonial rule. The nascent colonial territories were seen as both a source of raw materials and burgeoning markets for European manufactures. Extremely cognizant of the diversity of African consumer demands for various goods, Europeans deployed a wide range of trade materials produced specifically for different regions of West Africa. Focusing on European and locally produced African pipes from Senegal, this paper examines the use of pipes in dating archaeological sites from the late nineteenth and early twentieth centuries and their roles in the economic and cultural entanglements in the early colonial period of Afrique-Occidentale française.

**Oliveira, Cristina and Michelle LeFebvre (University of Florida)**

[67]

*Constructing Historical Shark Baselines: The Promise and Challenge of Zooarchaeological Science*

Sharks are among the world's most endangered vertebrate taxa, including recent estimates of approximately 71% loss in abundance over the past 50 years due to human impacts. Archaeological baselines of shark diversity, distribution, and exploitation can help provide essential historical context for assessing contemporary patterns in shark species loss and vulnerability to human-caused extinction. However, the zooarchaeological identification of shark species based on vertebral or tooth specimens can pose a significant challenge to the study of shark historical ecology. Apart from a few shark species, it is often difficult to confidently make taxonomic identifications to genus or species based on shark vertebral or tooth morphology alone, and particularly among environments with high taxonomic diversity present. Citing recent data from the Florida Keys, USA, this poster focuses on the potential and challenges of constructing shark baselines from zooarchaeological data, including avenues for future research. We also consider how archaeological perspectives can contribute to broader themes in shark biodiversity and conservation, including reductions of shark size through time, habitat loss, and human-shark relationships through time.

Oliver-Bozeman, Aimee [175] see Arakawa, Fumi

Olsen, Birte [33] see Madsen, Christian

Olsen, Birte [114] see Nielsen, Michael

Olsen, Birte [33] see Simonsen Bendtsen, Aka

Olson, Eric [83] see Nolan, Kevin

Olszewski, Deborah [60] see McPherron, Shannon

**O'Mansky, Matt (Youngstown State University) and Kelly Baer (Youngstown State University)**

[77]

*Reevaluating a Community Founder: Excavations at the John Struthers Farm, Struthers, OH*

United States Revolutionary War veteran John Struthers's life is fairly well documented. He and his family moved to Poland Township in northeast Ohio in 1799 after purchasing several hundred acres of land. A few years later he and his business partner built an iron blast furnace in Yellow Creek and subsequently acquired the nearby Hopewell Furnace, the first blast furnace constructed in Ohio. Struthers went to war to again fight the British in the War of 1812. The John Struthers lore reports that he returned to his home in Ohio after the war, essentially bankrupt, finding his businesses in ruins. He then worked to reestablish his farm and businesses, which he did with considerable success before his death in 1845. Recent archaeological and historical research indicates that the accepted narrative of John Struthers is not entirely accurate. While he suffered a number of personal

tragedies in the years after the war, his businesses appear to have thrived in his absence. Collaborative research between Youngstown State University faculty and students, and the Struthers Historical Society is working to correct the narrative of John Struthers, based on two seasons of excavations and a search for and examination of historical documents.

**Orange, Hilary (Swansea University)**

[50]

*Waste Heaps as High Points: Lighting IBA Emscher Park*

"The Ruhrgebiet has dared to open a large lighting construction site" said Karl Ganser in 1999, at the end of his directorship of the Internationale Bauausstellung Emscher Park Project (henceforth IBA Emscher Park). IBA Emscher Park was an urban development program led by the German federal state of Nordrhein-Westfalen from 1988 to 1999. IBA Emscher Park sought regional structural change. By revitalizing the Ruhr's economy, ecology, and culture, the region's dependence on its declining coal and steel industries could be replaced with new forms of industry, services and forms of leisure, tourism, and culture. The Ruhr Valley and its northern hinterland is relatively flat aside from a "mountain range" (of mine heaps or in German, *Halden*) that mark the territories of the former mines. This paper explores how the waste heaps, as high points, played a key role in forming IBA's night vision for Emscher Park by providing the means to counteract the disorientating qualities of the nocturnal urban landscape.

**Orbach, Meir (Zinman Institute of Archaeology, University of Haifa)**

[191]

*Death by the Water Hole: The Neshar Ramla Upper Units Faunal Assemblages*

Marine Isotope Stage 5 is one of the most interesting periods in Levantine prehistory, displaying remarkable variability in human types and mode of site occupation occurring during postulated last interglacial climate fluctuations. The faunal record from this period, the mid-Middle Paleolithic, is limited, consisting of several cave occupations that yielded *Homo sapiens* remains. The only open-air site is Neshar Ramla (central Israel), which was occupied by a Middle Pleistocene *Homo* group. The site is an 8m-thick sequence within a karst sinkhole that was divided to six stratigraphic units. We present a detailed zooarchaeological and taphonomic study of the two uppermost units of the sequence. We found an ungulate-dominated fauna with high species diversity compared to the aurochs-tortoise dominated lower units. Butchery, percussion marks and bone-burning are less frequent than carnivore modifications and corresponding bone fracture patterns. Evidence of minimal bone movement as extensive anatomical articulations attests to good in situ preservation. Our results demonstrate a clear difference between the upper and the lower layers, leading us to conclude that opportunistic ungulate hunting by humans and carnivores had occurred in the site's final phases of occupation, possibly as the ungulates came to drink water from the sinkhole.

Orbach, Meir [191] see Varoner, Oz

**Ordoñez, Maria (Universidad San Francisco de Quito)**

[1]

*Discussant*

O'Rourke, Daniels [24] see Gerard-Little, Peregrine

O'Rourke, Daniels [24] see Wiktorowicz, Conner

**O'Rourke, Dennis (University of Kansas)**

[112]

*Discussant*

Orr, Andy [24] see Wiktorowicz, Conner

Orrego Corzo, Miguel [55] see Schieber G de Lavarreda, Christa

**Ortega, Martín (UV) and Gabriela Montero (University of Kentucky)**

[145]

*On Heritage and Value: Preventing Looting in Archaeological Sites*

Illegal trade of archaeological pieces is one of the most pressing issues in current Mesoamerican archaeology. Over time, archaeologists have worked on programs to prevent trafficking of cultural heritage, ranging from museum policies to international treaties. However, the problem of the archaeological piece market does not arise at the international level, it is rather a result of a process that begins in the communities where the pieces are originally placed. In Mexico, it is common to see people selling pieces, both imitations and originals, along roads that lead to touristic regions. La Sierra and Mazapa, two archaeological sites of the Eastern Lower Papaloapan Basin, Veracruz, are an example of this issue, presenting evidence of intense looting. In this paper, I present a preventive program that is currently under construction within the PAMLAS project. I argue that looting, the first step of the illegal trade cycle, must first be prevented locally by studying the social and cultural context in which it is found. Instead of addressing the problem through international programs, I propose that we work with the concept of value locally, in an attempt to reconfigure how people in the surrounding communities understand and identify with their cultural heritage.

**Ortega Cabrera, Verónica (Universidad Autónoma del Estado de México)****[163]***Las ofrendas de la Plaza de la Luna Teotihuacán, evidencias del complejo ritual*

Five years ago we excavated the Plaza de la Luna in Teotihuacan, where we discovered a ritual deposit of offering into the tepetate soil, with monoliths of green stones and ceramics. The presentation is about these excavations and the results of ceramic analyses, with an interpretation of the archaeological contexts.

**Ortiz, Jose Raul (University of Arizona)****[59]***At the "Thorny Stone": The Maya Classic to Postclassic Transition at Kixpek, Guatemala*

This paper presents the results of the 2019 field season at Kixpek, a small archaeological site located in the region known as Zona Reyna, El Quiché, in the northern highlands of Guatemala. The first and previous archaeological exploration at the site was carried out by Robert Burkitt in 1922. That work, completed with unconventional excavation methods, provided an interesting collection of Maya artifacts from Kixpek; now at the Museum of Archaeology and Anthropology of the University of Pennsylvania. After 97 years, the Kixpek Archaeological Project resumes research at this site by addressing the social dynamics in a frontier zone between the Highlands and the Transversal / Petén Strip at a time of transition between the Late Classic and Early Postclassic (also called Epiclassic). The chronology of occupation, the horizontal and vertical extent of the site, and the ceramic affiliation will be discussed in light of preliminary results from fieldwork and laboratory analysis.

**Ortman, Scott (CU-Boulder)****[218]***Discussant*

Ortman, Scott [218] see Fletcher, Roland

O'Shea, Colleen [155] see Bongers, Jacob

**Osores Mendives, Carlos****[92]***Domestic Life and Warfare in the Zaña Valley during the Late Intermediate Period (AD 1000–1450)*

This poster examines the faunal remains retrieved from distinct refuse deposits and architecture from domestic sectors at "Cerro la Guitarra" and "Complejo Úcupe, El Pueblo" or "Huaca el Pueblo de Úcupe," Zaña Valley, north coast of Peru. The analyzed remains date to the Late Intermediate period, emphasizing the phase of warfare in which Chimú state expands into the Lambayeque/Sicán territory. Differences in the architecture and animal economy between sectors and sites have been identified, which it would correlate with social diversity. For example, we found differences in the consumption of mammals, fishes ("machete," *Ethmidium maculatum*, or "lorna," *Sciaena deliciosa*), and shells. Also, we found architecture variability in size, function, and inner distribution. These differences would indicate that the inhabitants of the different sectors may have employed different modes of economy, and may have had different identities. Finally, daily life would have occurred in non-isolating conditions, due to the maintained contact with people from other parts of the valley as fishermen.

Osores Mendives, Carlos [126] see Langlie, BrieAnna

Osorio, Daniela [92] see Milton, Emily

**Ossa, Alanna (SUNY Oswego)****[163]***Gulf Urbanism and the Ballcourt*

George L. Cowgill's ideas about the origins of urbanism and the lure of city living inspire this study on the social and political attractions of small centers of the Classic period (AD 300–900) in the Gulf Lowlands of south-central Veracruz. Gulf centers are small and their settlement more dispersed, so the interpretation of their urban origin often tends toward gradual accretion of settlement over time rather than the deliberate cultivation of urban services. Two separate recent studies on Gulf centers quantified the relationships of urban populations to plaza area and tabulated viewerships to ballcourt areas, respectively, providing the starting point for this study. This research focuses on ballcourts as socially and politically important spaces and evaluates their relationship to drawing or serving associated settlements. I use regional settlement data from Barbara Stark's Proyecto Arqueológico La Mixtequilla (PALM I, II) to quantify the relationship between ballcourts and residential use. Results indicated a much closer ratio (almost one to one in some cases) between the estimated center-associated populations and the number of prime seats in their ballcourts than previously identified. Ballcourts may have played a larger role in the integration of a broader spectrum of Classic Mixtequilla society and urban services.

Ostahowski, Brian [46] see Hollingshead, Analise

Oswald, Jessica [85] see Delsol, Nicolas

**Otárola-Castillo, Erik (Purdue University), Melissa Torquato (Purdue University), Trevor Keevil (Purdue University) and Matthew E. Hill (University of Iowa)****[40]***13,000 Years of Climate Change and Food-Security Risk Management of Great Plains Foragers and Farmers*

Food-security risk management is currently a prominent global challenge, with ~795 million people estimated to be undernourished worldwide. Predictions show that drastic climate changes will adversely impact food source availability and further exacerbate malnutrition. However, this is not a new problem for humans. Our ability to survive through climate change has been a feature of human evolution. Despite this, the impact of climate on prehistoric small-scale societies' food-security risk management is not widely known. We apply the concept of "Dietary Portfolios" to model the use of resource diversity as a bet-hedging strategy to manage foraging risk. We investigated the effect of climate change and foraging risk on dietary portfolios of a large sample of archaeological components from the North American Great Plains through its prehistory. Results show significant variation in behaviors to manage food-security risk across time. For example, during ~8500–6000 years cal BP these data show a striking increase in food-security risk. The patterning corresponds to the Holocene Climatic Optimum, a period on the Plains when resources were likely scarce. Bayesian modeling results show that food-security risk, annual temperature, precipitation, and temperature seasonality impacted dietary diversity and that Great Plains people alternated between generalist-specialist strategies to deal with fluctuations in climate associated food-security risk.

**Otárola-Castillo, Erik (Purdue University)****[40]***Chair*

Otárola-Castillo, Erik [40] see Coon, Sarah

Otárola-Castillo, Erik [40] see De La Puente-León, Gabriela

Otárola-Castillo, Erik [40] see Denker, Erika

Otárola-Castillo, Erik [16] see Hill, Matthew

Otárola-Castillo, Erik [40] see Keevil, Trevor

Otárola-Castillo, Erik [40] see Miller, Davin

Otárola-Castillo, Erik [40] see Torquato, Melissa

Ouimet, William [105] see Leslie, David

Out, Welmoed [149] see Dusseldorp, Gerrit

**Overholtzer, Lisa (McGill University)****[49]***Subaltern Counterpublics, the Tlaxcala Cabildo, and Colonized Women at Tepeticpac, Mexico*

In exchange for their service as Indigenous conquerors who fought alongside the Spanish to defeat their Aztec enemies, the Tlaxcaltecs were designed as direct subjects of the Crown, free from some forms of tribute, and were given some autonomy in ruling themselves within the Spanish administrative hierarchy. The cabildo, or municipal council, of Tlaxcala in some senses housed a subaltern counterpublic, organizing to fight for Indigenous interests within colonial structures. Yet the cabildo itself—filled by elite Indigenous men who positioned themselves as exemplary Catholic subjects—was exclusionary, and the copious documentation they left behind attests to anxieties about morality and women with respect to two traditional xerophytic plant products: cochineal and pulque. This paper explores the space-in-between that was the Tlaxcala cabildo, and also considers what we can glean archaeologically of the ritual performances in which women may have participated—rituals that may have taken place in domestic terrace space, but which were nonetheless neither public nor private.

**Owen, Bruce (Sonoma State University)****[217]***How Arriving Second Affected Tumilaca–Chiribaya Multiethnicity in the Coastal Osmore Valley, Peru*

An original promise of archaeological research in the Osmore (Moquegua) drainage was to investigate verticality and its associated multiethnicity. Radiocarbon dates and other evidence have shown that the clearly multiethnic settlement of the coastal Osmore valley near Ilo was not some essential Andean pattern or a simple response to ecological imperatives, but rather the historically particular outcome of sequential, additive population movements caused by specific sociopolitical processes. By the late Middle Horizon, the valley was occupied by people of the Chiribaya culture. Tumilaca refugees arrived later as the Tiwanaku polity collapsed, founding new settlements in the interstices of the Chiribaya settlement pattern. New and revised GIS, midden, architectural, mortuary, and other analyses elucidate evidence that this sequential process occurred, and of how it affected and reflected the relationship of the Chiribaya and Tumilaca populations and the lives of members of each group. The relationship was strikingly separate and unequal, but apparently largely peaceful. This explicitly historical and comparative approach might be enlightening in other cases of multiethnic settlement in the Andes and elsewhere.

Owen, Bruce [87] see Goldstein, Paul

**Ownby, Mary (University of Arizona) and Aaron de Souza (Austrian Academy of Sciences)****[150]***Social Identity and Paste Recipes: A Petrographic Study of Middle Nubian Pottery Traditions*

The prehistory of Sudanese Nubia has been marked by the classification of past peoples into cultural historical groups. The C-group culture is mostly found in northern Nubia and first appeared in 2400 BCE. Slightly later but in the same area and beyond is the Pan-Grave culture whose distinct burials are documented starting around 1800 BCE. Although there are some archaeological indicators to support these divisions, they also lack rigorous scientifically backed data, particularly for their ceramic traditions. The petrographic analysis of 25 samples from the Pan-Grave and C-group culture clarified the paste recipes employed and identified clay features distinctive to each group. While this provides a firmer basis for distinguishing the two cultures, it also raises many more questions related to how these groups lived on the landscape (especially their level of mobility), the organization of pottery production, and how the different vessel shapes and features are used to create social identity. Particularly interesting are similarities in firing technology and paste preparation, suggesting a common ceramic tradition despite form and raw material source differences.

**Ownby, Mary (University of Arizona)****[150]***Discussant*

Ownby, Mary [167] see Navas-Méndez, Ana

Oxenham, Marc [26] see Muir, Brianna

Özbal, Rana [122] see Lau, Hannah

Özbasaran, Mihriban [16] see Abell, Jordan

Özbasaran, Mihriban [16] see Duru, Gunes

**Pacheco, Ellen (University of Lethbridge), Jerimy Cunningham (University of Lethbridge) and Shawn Bubel (University of Lethbridge)****[225]***Ruffling Tail Feathers: The Role of Avifauna Species in Ancient Chihuahua Culture*

The Chihuahua Culture is generally understood as a complex social system situated along the boundaries of the American Southwest and northern Mesoamerica. Recent projects across the region have expanded our understandings of local lifeways, including the ways avifauna species were incorporated into ancient political systems. This paper will examine the interpretive consequences of including birds within the cultural systems present in the Casas Grandes region. We consider whether, beginning in the Viejo period, there is evidence for unique social relations between humans and bird species. While birds are known to supply skin, meat, feathers, and bones to ancient economies, the prevalence of birds in Chihuahua culture cosmology and ritual suggests important political associations. We draw on excavations at multiple sites within the Proyecto Arqueológico Chihuahua (PAC) and published material from Paquimé to suggest that birds and humans were part of a Mesoamerican “analogical ontology” described in the work of Philippe Descola.

**Pacheco-Forés, Sofia (Hamline University)****[193]***Beyond “Nonlocal”: Biogeochemical and Morphological Approaches to Examining Diverse Migrant Experiences in Epiclassic Central Mexico*

Over the last 40 years, biogeochemical methods have revolutionized the study of ancient migration and mobility, allowing bioarchaeologists to reconstruct the residential histories of past peoples and directly identify first-generation migrants. While biogeochemistry has greatly refined our ability to detect and understand paleomobility at the individual level, it remains limited in several key aspects. Diagenesis skews in vivo isotopic signatures to resemble the burial environment, and individuals are typically identified as having values consistent with “local” or “nonlocal” isotopic ranges. In this presentation, I examine the experiences of individuals interred at the central Mexican Epiclassic (600–900 CE) site of Non-Grid 4, where a minimum of 180 individuals were sacrificed and interred. Previous analyses indicate that the majority of sacrificial victims (70%) were “nonlocals,” suggesting they were targeted for ritual violence at least in part due to their divergent residential histories. I combine biogeochemical data with dental metric and morphological data to move beyond the local/nonlocal binary, attempting instead to access a diversity of geographic origins, push and pull factors, and migration/mobility experiences among individuals interred at Non-Grid 4.

Pacheco-Forés, Sofia [69] see Walker, Emily

**Pacyga, Johanna (University of Chicago)****[80]***Experiments in Cotton and Conversion: Mid-Nineteenth-Century Missionization at St. Joseph of Ngasobil (Senegal)*

A series of abolition and emancipation moments occurred over the nineteenth century, entangling unexpected and distant locales through shifting orientations and structures of labor and production. The story of the Agricultural Colony of St. Joseph, a Catholic mission in coastal Senegal illuminates some of the ways in which abolition rippled across the globe. Founded in 1863, St. Joseph’s was envisioned as a place where proselytization and economic development would flourish. The mission was conceived of as a

cotton plantation intended to fill the void left by the Confederate cotton embargo and subsequent blockade of southern ports during the American Civil War. Cultivation would be carried out by Senegambian neophytes, most of whom were formerly enslaved individuals or refugees from famine and warfare in the interior kingdoms. This paper explores the social and economic implications and repercussions of the St. Joseph cotton experiment, seeking to parse the ways in which overseas abolition and emancipation shaped a nascent colonial community and its participation in the global economy. Two interconnected colonial histories emerge: one about the nineteenth-century global cotton economy, and the other a seemingly local narrative about the ways in which missionization and colonial “mise en valeur” produced a new community.

**Pacyga, Johanna (University of Chicago)**

[80]

Chair

Paige, Jonathan [20] see Huang, Cindy Hsin-ye

**Pailes, Matthew (University of Oklahoma), John Carpenter (Centro INAH Sonora) and Guadalupe Sánchez (Centro INAH Sonora)**

[176]

*Recent Research in the Nuri Valley of Sonora, Mexico*

This poster will present the results of recent survey and excavation in the Nuri Valley of Sonora, Mexico. This location was previously hypothesized to be the location of “Oera” a population center that acted as an important trade hub in regional exchange networks of the proto-colonial period. Our investigations revealed a lengthy occupation of the valley going from at least the Late Archaic to the historic period. In contrast to predictions, the material record indicates the valley was relatively isolated. There were minimal amounts of the typical exchange such as painted ceramics, obsidian, shell, or colorful minerals. The relative demographic density of the Nuri Valley also appears to be less than neighboring valleys. These surprising results contribute to our understanding of the nature of regional interaction in Northwest Mexico, which allowed for highly variable levels of participation.

**Pailes, Matthew (University of Oklahoma)**

[176]

Chair

Pailes, Matthew [86] see Carpenter, John

Pailes, Matthew [176] see Davidson, Jaron

Pailes, Matthew [176] see Krug, Andrew

Pailes, Matthew [176] see Larrick, Dakota

Pailes, Matthew [176] see López Rivera, José Antonio

**Paixao, Eduardo (TraCER, MONREPOS | ICAREHB), Joao Marreiros (TraCER), Laure Dubreuil (Trent University), Walter Gneisinger (TraCER) and Marion Prévost (Hebrew University of Jerusalem)**

[191]

*The Middle Paleolithic Ground Stone Tools of Neshar Ramla Unit V (Southern Levant): A Multiscale Functional Analyses*

Ground Stone Tools (GST) are a remarkable artifactual group to explore technological changes and adaptations in the evolution of human behavior across time and space. GST may be regarded as clear and direct evidence of past human daily tasks involving percussive and/or abrasive activities. As such, they represent a testimony of the oldest, most persistent and durable technological strategy adopted by past hominins. In the Southern Levant, GST evidence is generally rare for the Early and Middle Paleolithic. At Neshar Ramla, both the high frequency of tools and good condition of preservation provide a unique opportunity to explore the use of GST during the Middle Paleolithic. This talk will present the assemblage of GST from Unit V, one of the most ancient and intensive phases of the site occupation. Functional studies were applied combining high-resolution and multiscale approaches. This includes 3D analyses and microscopic use-wear analyses, supported by a mechanical experimental program to keep a high level of variable control. Our analysis revealed tool types on which diagnostic use-wear can be associated with diverse activities, and specifically the presence of various types of hammerstone with distinct wear characteristics reflecting different functions including, in some cases, the processing of distinct materials.

Pajovic, Goran [147] see Tostevin, Gilbert

**Palacios Prado, Nicolas (Fundación Código Andino) and Fabiola Corominas Sustach (Fundación Código Andino)**

[224]

*Geomorfología fractal de los Andes y su relación con el trazado urbano y diseño arquitectónico de la cultura Inca*

Mediante análisis geomorfológico y levantamientos fotogramétricos georreferenciados estudiamos la relación entre la morfología del paisaje y arquitectura de algunos sitios incaicos del valle central de Chile; Chena, La Compañía, Collipeumo, Chada y El Peral. Tanto la morfología de los cerros seleccionados para los emplazamientos, como el trazado de murallas y recintos dan cuenta de un patrón de ejes paralelos y semi-ortogonales —retícula geomorfológica (RGM)— presentes en la geografía de los Andes. Estos ejes cubren grandes extensiones del continente sudamericano y se pueden detectar mediante geomorfometría de robustez y aspereza en modelos digitales de elevación y análisis de dimensión fractal. La geometría y orientación de esta RGM coincide en parte con características geográficas (costas, islas, lagunas, valles) y forma extensos alineamientos de montañas y volcanes. Esta

geomorfología fractal de los Andes fue ampliamente sacralizada por la cultura Inca mediante la integración de sus ejes principales en el trazado urbano y diseño arquitectónico de las ciudades y centros ceremoniales del Tawantinsuyu.

**Palefsky, Gina (University of California, Merced), Thanik Lertcharnrit (Silpakorn University), Sora Kim (University of California, Merced) and Kelly Knudson (Arizona State University)**

[157]

*Human Diet and Mobility in Metal Age Central Thailand: Regional, Site, and Individual Scales*

Archaeological evidence from central Thailand has demonstrated the persistence of localized agricultural regimes over the course of the Metal Age (ca. 1100 BCE–CE 500), thought to reflect a combination of ecological constraints and the maintenance of existing cultural food traditions. At the same time, novel forms of body modification and ritual mortuary traditions emerged, which may reflect the maintenance of nonlocal traditions among immigrants to the region or provide evidence of emergent social differentiation within communities. Using bioarchaeological and isotopic analyses, this study investigates the relationships among aspects of social identity, mobility, and dietary change over individual lifetimes and across generations. We present the results of  $^{87}\text{Sr}/^{86}\text{Sr}$ ,  $\delta^{18}\text{O}$ , and  $\delta^{13}\text{C}$  analyses of archaeological human and faunal skeletal samples ( $n = 150$ ) from four Metal Age sites in central Thailand in conjunction with mortuary and skeletal evidence of past social identities, including patterns of tooth ablation, the inclusion of food resources in mortuary contexts, and burial with intentionally broken ceramic and metal artifacts. Results demonstrate spatial and temporal variation in human dietary, mobility, mortuary, and body modification patterns, evaluated within bioarchaeology of community frameworks, and in light of archaeological and ethnographic evidence for broad-spectrum foraging in this region.

**Palefsky, Gina (University of California, Merced)**

[157]

Chair

Palermo, Rocco [183] see Creamer, Petra

**Palka, Joel (Arizona State University)**

[188]

*Waterscapes in Past and Present Maya Cultures at Mensabak, Chiapas, Mexico*

Important Maya geographical features at Mensabak, Chiapas, Mexico, include dynamic waterscapes. For over 2,000 years, the impressive red-stained Mirador Mountain on an island in a blue lake—an altepetl (“water mountain”) in Mesoamerican beliefs—has symbolized local Indigenous origins and connections to the landscape. This mountain and lake form the Tuliá River, which is a major river running to the Gulf Coast that attracted traders and pilgrims to its source over the centuries. Equally significant are the dramatically fluctuating lake levels that shift between 8 m and 15 m every year exposing cliffs, islands, and canals. Some exposed watery features include a monumental swimming feathered serpent, the Moon Goddess’s island, and Tlalocan, the land of the dead. The changing water levels are not only ritually important, they are symbiotically beneficial for local plant, fish, animal, and human communities. This presentation covers the archaeological and ethnographic studies of Maya waterscapes at Mensabak from the Preclassic period to the present Lacandon, including lakeside pilgrimage shrines, canoe ports, logwood stands, and modified fish reservoirs. As a student at Copan, Honduras, Wendy Ashmore inspired me to consider both scientific and cultural perspectives on Maya landscapes, which I continue today.

**Palomo Mijangos, Juan Manuel (University of Arizona) and Melissa Burham (University of Arizona)**

[26]

*Preceramic Occupation in the Maya Lowlands: Evidence from the Amoch Group at Ceibal Guatemala*

Little is known about the groups who inhabited the Maya lowlands before the adoption of ceramics and the establishment of sedentary communities. Direct evidence from this period, and bioarchaeological remains in particular, are elusive due to the difficulty in identifying potential preceramic sites and the poor preservation conditions of the tropical environment. This dearth in the archaeological record has led many scholars to suggest the lowlands were largely uninhabited. However, recent excavations in the Amoch Group at Ceibal, Guatemala revealed four burials dating to around 1000 BC, which predates the earliest known ceramic-bearing contexts in the site center by several decades. The burials likely represent a rare case of preceramic occupation outside of Belize, and provide important information about mortuary treatments, dietary practices, and migration patterns of people living in the area during this early period. The data also provide insights into the transition to a sedentary lifestyles and how the earliest permanent communities were created. The preceramic burials found at Ceibal further support the interpretation that small, semi-mobile groups who subsisted on a combination of agriculture, fishing, hunting, and foraging lived in the area before the adoption of sedentary communities throughout the southern Maya lowlands.

**Palumbo, Scott (College of Lake County)**

[125]

*Soil Fertility and Resource Catchments during the Aguas Buenas*

The Aguas Buenas period (roughly 300 BC to AD 900) in southern Costa Rica and western Panama was characterized by the growth of small villages, a reliance on cultivated foods, and the development of identifiable settlement hierarchies in certain areas. This paper applies site catchment analysis to evaluate the relationship between site location and soil fertility as an indirect way to model the types of resources available to past inhabitants. Two case studies drawn from pedestrian systematic surveys are considered: the middle Térraba of Costa Rica and the upper Chiriquí Viejo of Panama.

**Panich, Lee (Santa Clara University)****[45]**

*Holistic, Diachronic, and Broadly Comparative: The Lightfoot "Holy Trinity" and the Historical Anthropology of Colonial California*  
 Holistic, diachronic, and broadly comparative. These concepts generally comprise the "Holy Trinity" of archaeological approaches to colonialism for Kent Lightfoot's students at the University of California, Berkeley. In this paper, I provide an overview of how these concepts have shifted archaeological perspectives on the long-term entanglements between outsiders and the Indigenous peoples of Alta and Baja California. Following Lightfoot's lead, recent research in the region considers a broad cross section of everyday practices, traces changing continuities from precontact times into the present day, and makes comparisons across multiple geographic, colonial, and temporal contexts. Drawing on my research with Ohlone groups in the San Francisco Bay Area and the Paipai community of northern Baja California, I argue that archaeology, as part of historical anthropology, has a powerful role to play in documenting how Native Californian communities have successfully negotiated shifting colonial systems over the past 250 years.

**Pape, W. Kevin (Gray & Pape Inc.)****[219]**

*The Art of Midair Construction: Building and Sustaining the Business of CRM through the Lens of Gray & Pape Inc.*

The business of cultural resources management was born out of entrepreneurial responses to passage of the National Historic Preservation Act and its implementing rule-making. Early CRM firms were established across the country as opportunities and markets quickly developed around the regulatory process. Without the benefit of a unifying business paradigm, each firm navigated its own path to success; the American Cultural Resources Association, created in the mid-1990s, would begin to influence the adoption of common professional and business practices. CRM was always conceived of as multidisciplinary, and a vehicle for delivery of synthetic research, but that vision remains less than fully formed. CRM has been deeply influenced by its early roots in Departments of Anthropology and priorities driven by archaeological research. As the practice of CRM matures, signs point to the emergence of clearly divergent business strategies: one path following a more commodity-based, transactional approach, another adopting a cultural heritage approach which strives to integrate community voices and international heritage standards. Future trends in CRM will be driven by the creativity and perspectives of new CRM leaders who are gaining influence as CRM's founder cohort retires.

**Pappenfort, Logan (Illinois State Museum)****[180]***Moderator*

Pardiwalla, Yazad [149] see Chauhan, Parth

**Pareja, Dante, Javier Iñáñez (Universidad del País Vasco), Rémy Chapoulie (Université Bordeaux Montaigne) and Luisa Diaz (G.I. Sociedades Prehispánicas del Litoral-Yungas)****[29]**

*Ceramic Production Technologies on the Central Coast from the Late Intermediate to the Late Horizon: Study of Ychsma Ceramics (AD 1250–1532), Lima, Peru*

The central coast of Peru comprises the valleys of the Chillón, Rímac, and Lurín Rivers and the current city of Lima, capital of Peru. The Ychsma society that developed in this geographical area between AD 1000 and 1532 was considered an important Andean civilization. In 1470, the Ychsma region was annexed to the control of the Inca Empire, keeping some political autonomy, until the arrival of Spaniards in AD 1532. To unveil the features linked to the production and the deconstruction of the operational chain of Ychsma ceramics, we have adopted a multi-analytical approach using 200 ceramic fragments from different vessel types (e.g., pitchers, jar, and pots) from the main archaeological sites of Armatambo and Pachacamac, among others. The study involved macroscopic observations, cathodoluminescence, X-ray diffraction, scanning electron microscopy, and petrography. The use of this array of techniques has allowed us to identify technical production traces, create technological groups, and establish equivalent firing temperatures. Notably, three groups of firing temperatures ranging from 700°C to 950°C were identified. Furthermore, these preliminary results allow us to confirm the existence of a technical tradition that is maintained over time from the Middle Ychsma to the Late Ychsma.

**Paris, Elizabeth (University of Calgary), Roberto López Bravo (Universidad de Ciencias y Artes de Chiapas) and Gabriel Laló Jacinto (Instituto Nacional de Antropología e Historia)****[199]**

*The Founding of Tenam Puente, Chiapas, Mexico: Early Public Spaces in a Highland Maya City*

This paper examines the earliest construction phases of public spaces at the ancient Maya city of Tenam Puente, located on the southeast edge of the Comitán Plateau in highland Chiapas. Plazas are fundamental features of ancient Mesoamerican cities that were important sites for civic activities such as mass spectacles, ceremonies, private rituals, feasting. More recently, certain plazas have also been documented as permanent or periodic marketplaces. Test excavations in the site's Main Plaza reveal early construction phases of the site's principal ballcourt, Ballcourt 1, as well as a large stela platform. Stratigraphic deposits contain early domestic midden refuse, and associated AMS <sup>14</sup>C dates suggest that these residences dated to the Middle Classic period. The early ballcourt construction and stela platform provide evidence for early ceremonial practices and ritual behavior in the early plaza, while associated refuse includes incense burner and figurine fragments, bone ornaments, and a wide range of utilitarian items. These early construction phases provide a clear contrast in form and function with later Late Classic period modifications, and provide insight into the changing nature of public space at the site.

Paris, Elizabeth [199] see Meanwell, Jennifer

Parish, Ryan [117] see Barlow, Robert  
 Parish, Ryan [187] see Harvey, David

**Park, Gayoung (University of Washington), Li-Ying Wang (University of Washington) and Ben Marwick (University of Washington)**

[40]

*How Do Archaeologists Write about Racism? Computational Text Analysis of 41 years of Society for American Archaeology Annual Meeting Abstracts*

Many communities and organizations responded to the murder of George Floyd in May 2020 with discussions to address systematic and institutionalized racism. We ask how often, and in what contexts, archaeologists have discussed racism over the last 41 years. Do social events lead to enduring discussions of racism in academic communities? In this research, we take computational and statistical approaches to explore how ideas of racism have influenced the history of American archaeology. We collect 68,176 abstracts from 41 meetings of the Society for American Archaeology (SAA) and apply computational text analysis methods including word frequencies and proportions, topic models, word similarities, keyword-in-context (KWIC), and linear regressions. To explore the responsiveness of SAA meeting presentations to contemporary social issues relating to race, we modeled relationships between word frequencies in annual meeting abstracts and social events related to anti-Black racism. Our results, from a computational analysis of a big dataset of archaeological text, support previous studies finding that archaeologists rarely participate in discussions of racism in their professional work. We also find that the racism-related topics are usually as a passing mention with a suite of broad social issues.

**Parker, Evan (Tulane University), George Bey III (Millsaps College) and Tomás Gallareta Negrón (INAH Centro Yucatán)**

[34]

*Chronological and Spatial Context for the Early Maya Ballgame: The View from Paso del Macho, Yucatán*

Few archaeologists anticipated that one of the most prominent types of Middle Preclassic ritual architecture in the Northern Maya Lowlands would be ballcourts. Survey and excavation conducted by the Costa Maya project revealed the importance of this type of architecture in relation to regional site hierarchies and community integration. Recent work in the Puuc region has also uncovered the presence of ballcourts at village sites. At the Middle Preclassic village settlement of Paso del Macho, excavations in the plaza, the ballcourt, and in other platforms have established a construction history for the site. With this context, it appears that the construction of the ballcourt and the playing of the ballgame supplanted earlier forms of ritual action, specifically the caching of valuable items such as jade. This shift reflects changes in cultural domains of value that were instrumental in the development of institutionalized inequality. This relates more broadly to the increasing formalization of ritual spaces in a variety of formats across the Northern Maya Lowlands during this time.

Parker, Evan [172] see Seligson, Ken

**Parker, Katherine (University of Tennessee Knoxville)**

[203]

*Excavating Moonshine: An Overview of the Archaeological Applications of Still Site Research*

Moonshine distillation sites, or still sites, represent a ubiquitous archaeological site type across the United States; however, investigations of these sites have been comparatively limited. Even less attention has been paid to the research potential of moonshine stills, though a growing body of research indicates that these sites are significant cultural resources. Moonshine has long been a source of fascination to the broader public, particularly as the rise in commercial distilling has contributed to a massive tourism industry and rekindling of moonshining depictions in popular media; despite this popularity, moonshine studies represent an area of untapped historical potential for researchers and land managers looking to engage public interest in archaeology and regional history. Archaeological investigations of still sites also present the professional community with an appealing avenue through which to combat problematic regional stereotypes and negative historical narratives. This paper will synthesize past approaches to the archaeological study of moonshining, including the theory, methods, and particular regional case studies and will advance models for incorporating still sites into broader research and resource management planning.

**Parker, Katherine (University of Tennessee Knoxville)**

[203]

*Chair*

Parkinson, William [2] see Gyucha, Attila

Parrilla-Giráldez, Rubén [98] see Simón-Vallejo, María

**Parris, Caroline (Tulane University)**

[59]

*More than Feasts: The Implementation of a Multidimensional Model to Examine Commensality among the Late Classic Maya of La Corona, Guatemala*

The study of commensality among the ancient Maya has often focused on feasts, especially the extraordinary, diacritical, or communal feasts that are more easily visible in the archaeological record. These kinds of events are often identified through ceramic and faunal analyses. This paper presents the results of a new multidimensional model for the study of commensality. Utilizing

materials excavated from La Corona, Petén, Guatemala, artifactual and spatial data from 14 midden and redeposited-midden contexts were analyzed along three axes. The implementation of this multidimensional model demonstrates the utility of this approach and creates a new understanding of the multiple modes of commensality performed by the Late Classic period rulers and residents of La Corona.

**Pascual Soto, Arturo (Instituto de Investigaciones Estéticas UNAM)**

[55]

*"Los guerreros muertos": Rasgos e identidad en el arte de El Tajín de la primera mitad del Epiclásico (ca. 800 dC)*

Las más tardías transformaciones que experimenta el arte de El Tajín, Veracruz, están vinculadas con el ascenso de un nuevo linaje de gobernantes y con una serie de manifestaciones orientadas a señalar su distinta identidad. Entre estas demostraciones resalta la construcción en el punto más alto del asentamiento de una nueva sede de gobierno. Todas las edificaciones del conjunto surgen al mismo tiempo para mantenerse en el centro de la vida política de la ciudad por un período no menor a trescientos años. El Edificio de las Columnas y su notable complejo arquitectónico se remontan a la primera mitad del Epiclásico y es posible que debamos tenerlo como un enorme conjunto promovido por los señores de la casa de 13 Conejo. La ponencia explora desde la perspectiva de los murales los cambios que se generan en el arte de la ciudad, los temas que abordan y las representaciones de estos guerreros en función de sus características individuales, tanto en los muros como en las tapas pintadas de un conjunto de cistas que datan de esta época, para discutir los elementos que sirven en ellas para "retratarlos" tras su inhumación bajo el piso de los aposentos del Edificio 40.

Paspalas, Stavros [67] see Kardulias, P. Nick

Pasqual, Theresa [152] see Reed, Paul

Patch, Sean [24] see Dobbins, Paige

**Patterson, Erin (Tulane University)**

[209]

*Reconstructing Ancient Diet: Stable Isotope Values from La Corona and El Perú-Waka'*

Ancient Maya subsistence strategies relied heavily on maize agriculture, though diets were often quite diverse and varied by time, place, and person. Isotopic studies provide a direct way to examine past foodways. This paper presents results of stable isotope analysis of human bone collagen (carbon and nitrogen) and apatite (carbon and oxygen) from individuals buried at the sites of La Corona and El Perú-Waka' in northwest Petén, Guatemala. The data are examined for variations in isotope values between individuals based on sex, time period, and social status. The results are integrated with existing knowledge about the sites, including osteological and isotopic data about health, diet, and mobility, to create a more complete picture of life in the Maya Lowlands during the Classic period.

**Patterson, Thomas (University of California, Riverside)**

[188]

*Discussant*

**Patton, Katherine (University of Toronto), Arthur Anderson (University of New England) and M. Gabriel Hrynck (University of New Brunswick)**

[114]

*Integrating Existing Collections with Small-Scale Testing: Preliminary Results from Sipp Bay, Downeast Maine*

ME 80.25 and 80.40 are two rapidly eroding Maritime Woodland period shell heap sites in Downeast Maine, in the Peskotomuhkati homeland. They are also representative of a site type that has received little archaeological attention in the region. Unlike the large, stratigraphically complex shell-bearing sites in coastal Maine that have been well-investigated, ME 80.25 and 8.40 are composed of thin deposits of dispersed shell. None the less, these sites are important to understanding continuity and at times, changes, in Ancestral Peskotomuhkati lifeways, and in particular, settlement. In this poster we present an approach to analyzing the research potential of eroding sites that incorporates information from existing archaeological collections with the results of small-scale archaeological testing and column sampling. This approach allows us to address what we feel are critical and as-of-yet-unanswered archaeological questions without adding large collections to state and community repositories.

Patzschke, Renate [3] see Fuchs, Peter

**Pauketat, Timothy (University of Illinois), Robert McCullough (Illinois State Archaeological Survey), Michael Farkas (Illinois State Archaeological Survey) and Susan Alt (Indiana University)**

[15]

*Steam Bath Ceremonialism from the Top Down*

A rebuilt circular steam bath or sweat lodge has been identified in a targeted electromagnetic induction survey of a small portion of Monks Mound's summit at Cahokia. The discovery enables us to pinpoint the axis mundi of the entire urban precinct, a single

position where the baseline of Cahokia's 5-degree-offset grid intersected the highest point in the complex. More extensive architectural data from the nearby Emerald Acropolis verify the significance of such official Cahokian buildings in the late eleventh and early twelfth centuries CE. They occupy one end of water-related mound-and-causeway or paired-building complexes, have celestial and terrestrial referents, and are the foundational elements of Greater Cahokia's urban plan. Their disappearance after 1200 suggests an act of top-down ceremonial termination that fundamentally altered Mississippian history.

**Pauketat, Timothy (University of Illinois)**

[87]

*Discussant*

Pauketat, Timothy [15] see Aiuvalasit, Michael

**Pavao-Zuckerman, Barnet (University of Maryland)**

[16]

*Honor among Bees: Human Ecology in Colonial Period North America*

Although her own work focuses on Paleolithic human paleoecology in the circum-Mediterranean, the impact of Dr. Mary Stiner's scholarship extends across time and space. In this contribution, I offer a historical archaeologist's perspective on the significance of Dr. Stiner's research, specifically to the zooarchaeology of colonialism in North America. Although human impacts on ecosystems in market-driven systems are often broader in scope and accelerated in pace, the same ecological models apply—human ecosystem dynamics within complex societies of the recent past differ from those of small-scale Paleolithic societies in scale, but not in quality. Indeed, human ecodynamics in the colonial period exemplify the complementary interpretive power of human behavioral ecology and niche construction theory as employed by Stiner. As in the deeper human past, the day-to-day decisions of seventeenth- and eighteenth-century actors set in motion large-scale and, at times, ferociously rapid feedbacks that were neither intentional nor predicted, but nevertheless transformed human ecosystems and the daily lives of the colonized and colonizer.

Pawlowicz, Leszek [113] see Lloyd, Amanda

Peacock, Clélie Cottle [136] see Wyatt, Andrew

Peacock, Evan [30] see Renson, Virginia

Pearce, David [155] see Bonneau, Adelphine

Peate, David [71] see Waterman, Anna

Pecci, Alessandra [220] see Moragas, Natalia

Pechenkina, Kate [193] see Miller, Melanie

**Peck, Katherine (University of New Mexico)**

[207]

*Historical Ecology and Community Management: A Case Study from South Kohala, Hawai'i Island*

The uplands of Kohala, Hawai'i Island, contain a dense network of agricultural field borders primarily used for rain-fed cultivation. In the traditional land tenure unit of Kawaihae 1 in South Kohala, these fields are located in an area theoretically too dry for rain-fed agriculture. However, Hawaiians constructed flow irrigation ditches to compensate for this lack of rainfall. This paper explores how the theoretical framework of historical ecology allows agricultural sites to be studied complexly—examining how both human ingenuity and natural landscape factors interact to make marginal landscapes productive. Further, examining the dynamic ways that Hawaiians interacted with and shaped the landscape of the South Kohala Field System in the past has the capacity to provide useful data for a proposed community-led landscape management plan in the present. These data not only include the mapped locations of archaeological sites but also the results of soil nutrient and other analyses. Overall, research rooted in historical ecology not only produces important ecological data but can also provide useful outcomes for modern communities.

**Peelo, Sarah (Albion Environmental Inc.) and Jun Sunseri (University of California, Berkeley)**

[41]

*Archaeologies of the Colonial Encounter: Sharing a Pedagogical Legacy across Professions, Generations, and Communities*

Out of mucky clay, Judith transformed her first two graduate students at UCSC into hardened archaeologists. Grounded in feminist and Marxist theory and material science, we have navigated careers exploring the archaeology of the colonial encounter. Dr. Sunseri is training the next generation of anthropological archaeologists at UC Berkeley. Working with communities in New Mexico, California, and Limpopo Province (South Africa), Jun brings what he learned from Judith to an archaeology that serves the living in their current struggles for self-determination. Dr. Peelo has directed multiple CRM projects at the site of Mission Santa Clara de

Asis, ca. 1777 (CA-SCL-30H). Her team's work investigates how the diverse Indigenous population at this mission continued to incorporate traditional objects into their daily practices, as well as modify the production, exchange, and use of these items. This research informs our understanding about how native peoples living within the mission negotiated not only cultural or ethnic identity, but also other aspects of one's social identity, tied to status and gender. Through us, Judith's framework for challenging an understanding of colonial encounters extends to new generations of students, archaeological professionals, as well as community members working to preserve their own heritage.

Pelton, Spencer [97] see Mackie, Madeline

Penders, Thomas [24] see Collins, Lori

Penders, Thomas [24] see Duncan, Neil

**Peniche May, Nancy (INAH / Universidad Modelo) and Susana Echeverría Castillo (FONATUR)**

**[34]**

*Multitasking in the Game: The Middle Preclassic Ballcourts of the Northwest Yucatán*

During the archaeological survey conducted by the Costa Maya Project in the last decade of the twentieth century, archaeologists discovered more than 100 Middle Preclassic archaeological sites (1000–400 BC), which have changed our understanding of the sociopolitical complexity prevailing in northwest Yucatán in these early times. One of the most interesting aspects of these findings is the fact that 24 sites exhibited ballgame courts in their architecture plan. The sociopolitical role these architecture patterns played has been the subject of debate since their discovery. The variations in architecture complexity exhibited by these ballgame courts, as well as those exhibited by the Mesoamerican courts, have contributed to the difficulty of understanding these architecture patterns and the activities performed in them. As a result of research conducted in recent years, the number of sites with ballcourts has increased to 41. Some of these have been excavated providing relevant material culture that allows us to establish when they were probably built and what activities were carried out there. This presentation aims to understand the sociopolitical functions that, both the ballgame courts and their associated activities, played during the Middle Preclassic in northwest Yucatán, highlighting the idea that those spaces were multipurpose centers of activity.

Peralta, Eva [47] see Gil, Adolfo

**Perdikaris, Sophia (University of Nebraska, Lincoln)**

**[212]**

*Discussant*

Pereira Miguel, Catarina [18] see Vázquez de Ágredos Pascual, María Luisa

Pereira Miguel, Catarina [155] see Vidal-Lorenzo, Cristina

**Peres, Tanya (Florida State University), Sarah Baires (Eastern Connecticut State University), Grace Riehm (University of North Carolina, Chapel Hill), Karen Stevens (University of Kentucky) and Erin Nelson (University of South Alabama)**

**[12]**

*Re(Sourcing) Knowledge: Considering Access, Authorship, and Citation in Archaeology*

White, cisgender men dominate peer-reviewed publications in high-status archaeology journals. These studies point to larger systemic issues that include sexism, gender stereotypes, gender and racial disparities in mentoring, familial obligations, and institutional barriers that lead to and perpetuate disparities in research output. During the summer of 2020, social and political unrest in our country, coupled with a global pandemic that had most of the world on lockdown, spurred us to take action toward increasing access and parity within our discipline. The Re-Centering Southeastern Archaeology Team created an open-access, community-sourced bibliography that includes works by authors from historically marginalized groups (women, Black, Indigenous, people of color, LGBTQ+ archaeologists, and scholars of all abilities). Its focus is on research questions that pay particular attention to the concerns of historically marginalized groups. The bibliography is useful in constructing syllabi and reading lists, connecting to a larger body of research, and increasing mentoring and research collaboration opportunities. The bibliography and team approach is a model that other archaeological communities and disciplines can replicate. We must continue to critically reflect on our everyday practices of citation and to consciously diversify sources of knowledge within and beyond academe.

Peresani, Marco [187] see Falcucci, Armando

**Perez, Daniel (University of Nevada–Las Vegas)**

**[208]**

*Understanding Virgin Branch Social Dynamics in Light of New Chronometric Data from the Moapa Valley, Southern Nevada*

The chronometric record of the lowland Virgin Branch region of Southern Nevada has long been assumed to loosely correlate with neighboring archaeological regions; however, this premise remains almost entirely untested. Recent optically stimulated luminescence (OSL) dates from two Virgin Branch sites in Southern Nevada provide greater clarity of the chronometric record and associated inferential conventions regarding Virgin Branch chronology and social dynamics in the Moapa Valley. In light of these

OSL dates, this paper also presents a reassessment of broader considerations regarding interregional trade, exchange, and associations between Virgin Branch populations in Southern Nevada and neighboring Kayenta populations in northeastern Arizona.

**Perez, Daniel (University of Nevada–Las Vegas)**

[58]

*Moderator*

[208]

*Chair*

**Perez, Elizabeth (University of Miami), Daniel Koski-Karell (National Institute of Archaeology) and William Pestle (University of Miami)**

[19]

*New Insights on the Earliest Inhabitants of Southwestern Puerto Rico: Bioarchaeology of the Ortiz Site Burials*

Despite over a century of archaeological work in Puerto Rico, detailed information on the lives of the island's first inhabitants—the so-called "Archaic" or "Pre-Arawak" people—remains scarce. This is particularly true bioarchaeologically, as fewer than 20 burials of demonstrated Archaic antiquity have been recovered to date. Here, we present the results of archaeological, osteological, radiometric, and stable isotopic analysis of five individuals from the Ortiz site in Cabo Rojo, southwestern Puerto Rico. Study of these previously unpublished remains provides many critical insights into early Puerto Rican lifeways. A review of their burial treatment finds a mostly standardized set of mortuary practices, a noteworthy finding given the site's millennium-long use as a mortuary space. Although osteological analysis was limited by poor preservation, we were able to reconstruct aspects of the demography and, in particular, dental health of the population, confirming the presence of both male and female adults of widely varying ages. Stable isotope analysis revealed marked dietary differences than later, Ceramic Age, individuals. Most crucially, AMS dating confirms that these are the oldest directly dated burials yet recovered from the island, providing us with a glimpse into the lives of some of the island's first inhabitants.

Perez, Griselda [153] see Navarro-Farr, Olivia

Pérez, María Fernanda [74] see Vidal-Elgueta, Alejandra

Pérez Arias, Adolfo [87] see Pérez Arias, Maribel

**Pérez Arias, Maribel, Adolfo Pérez Arias (Universidad Mayor de San Andrés) and Scott Smith (Franklin & Marshall College)**

[87]

*River and Pampa: A Regional View of the Machaca Formative*

When John Janusek originally designed the research plan for the Proyecto Arqueológico Jach'a Machaca (PAJAMA), he conceived the project to be comparative in nature. He proposed to contrast the development of the inland center of Khonkho Wankane with the Late Formative occupation of Iruhito, located 30 km to the west along the Desaguadero river. While Khonkho Wankane has received much of the attention in discussions of John's impact on Lake Titicaca basin archaeology, the work that he coordinated and supported at Iruhito was highly significant as well. In this paper, we remember the history of John's influence at Iruhito and take up his original objective to consider the relationship between the inland and riverine sites. We discuss our more recent results from investigations of Iruhito, which build on the foundation John laid. At the end of the paper we briefly consider John's legacy as a supporter of Bolivian archaeology students and professionals.

Pérez Castellanos, Nora [59] see Ejarque Gallardo, Ángela

Pérez Diosdado, Angélica [174] see Navarro Sandoval, Fernanda

Pérez-Juez, Amalia [108] see Forste, Kathleen

Pérez-Juez, Amalia [108] see Smith, Alexander

**Perez Rodriguez, Veronica (University at Albany, SUNY)**

[13]

*Governance, Political Strategies, and Power Negotiation at Cerro Jazmín, Oaxaca*

Research on the early cities of Oaxaca has revealed that there were different pathways to complexity and different models of urbanism. Although the impact of Monte Albán and its rise cannot be understated, as research into other nearby regions and polities has continued it has become clear that Monte Albán's regional power and influence was not absolute and it was constantly negotiated. Evidence of tension and fluid negotiation between other early cities of Oaxaca and Monte Albán can be seen in how other regions and polities used, adopted, traded, emulated, resisted, or rejected certain kinds of Zapotec material culture. There is also evidence of multifaceted trajectories of how governance and inequality was established, legitimized, and negotiated within the various polities themselves. This presentation discusses evidence from Cerro Jazmín, how the polity was first established and built and the evidence that suggests that different forms of governance and political strategies were employed to first establish the polity

and then ensure its continuation in the late and terminal Formative periods. I also discuss ceramic evidence that suggests changing trends in the use, trade, and possible rejection of certain Zapotec ceramic types.

**Peros, Matthew (Bishop's University)**

[19]

*Holocene Climates, Environments, and Sea Levels in the Circum-Caribbean Region: Implications for Archaeology*

The purpose of this paper will be to review the current state of paleoenvironmental research in the Caribbean with a view to providing climate and environmental context for ongoing archaeological research in the region. The past few years has seen a relative explosion of research focused on the Holocene, including high-resolution data from speleothems, sediment cores from lakes, cenotes, and blueholes, and other archives, utilizing a wide range of proxy indicators. There is now sufficient data to begin broader-scale climate syntheses for the region, which provide information on changes in hydroclimate, sea surface temperatures, and storms at the decadal- to centennial-time scales. Such data has important implications for Caribbean archaeology in terms of understanding migrations to and between islands, as well as cultural adaptations to abrupt climate and environmental changes.

**Perrotti, Angelina (Brown University, University of Wisconsin–Madison), John Williams (University of Wisconsin–Madison) and James Russell (Brown University)**

[116]

*Environmental Change after Late Pleistocene Megaherbivore Extinction at Lake Tulane, Florida*

Understanding the ecological consequences associated with the late-Quaternary megafaunal extinctions (LQEs) is an active area of research that has direct implications on interpreting the archaeological record of early people in North America. Researchers are divided about the importance of the LQEs and resultant trophic downgrading on plant community dynamics. A key challenge is to closely link past records of vegetation change with past megaherbivore distributions and dynamics. This project uses new ecological proxies, such as coprophilous fungal spores and fecal sterols, and new climatic proxies, such as branched glycerol dialkyl glycerol tetraethers (brGDGTs), to investigate climate change, megaherbivore dynamics, and vegetation turnover at Lake Tulane, Florida. Specifically, this poster presents evidence for a warm, wet Younger Dryas in peninsular Florida, as well as a cascade of vegetation changes after megaherbivore extinctions. Ultimately, these environmental changes can be used to contextualize the archaeological record of late Pleistocene-early Holocene as early people adapted to both the loss of megaherbivores and subsequent environmental change.

**Perry, Megan (East Carolina University)**

[193]

*"Foreigners," "Nonlocals," "Immigrants": Aligning Isotopic Values and Community Identity at Petra, Jordan*

The focus on environmental isotope data in many areas of the world has allowed greater geographic contextualization of human isotope values in terms of migration patterns and diet. However, these values are meaningless without proper cultural and historical context. Here we explore the relationship between strontium and oxygen isotope values and intersectional identities in ancient Nabataean society based on epigraphic and archaeological data. Eighty molars and premolars representing nine non-adult and 53 adult individuals excavated from the second century BC to late first century AD tombs on Petra's North Ridge were subjected to oxygen isotope analysis to assess migration into the ancient city. Of these, 30 molars or premolars representing eight of the non-adult and 22 of the adult individuals also were sampled for strontium isotope analysis for the same purpose. Six outliers were identified in the oxygen isotope data and one outlier in the strontium data. Mortuary behavior did not materially differ in the treatment of these individuals regardless of their isotopic status. The isotopic data combined with epigraphic and archaeological evidence may indicate the cosmopolitan nature of Petra meant an isotopically distant origin may not have fundamentally resulted in a "foreign" identity in the community.

Perry, Megan [161] see Stewart, Jalynn

**Person, Dylan (University of Nevada–Las Vegas) and Barbara Roth (University of Nevada–Las Vegas)**

[69]

*Shattering the Silicate Ceiling: Engendered Perspectives on Women's Production Management in the Mimbres Mogollon*

Around 30 years have passed since Gero challenged lithic researchers to reformulate technological arguments in a more appropriate framework than the hyper-masculinized version available at the time. Adopting this engendered view of the archaeological record has resulted in significant advances in how we view past divisions of labor, especially when highlighting the importance of women's work in the past. Building on this direction, we draw on Pueblo ethnographic analogy to conceptualize Mimbres Mogollon women as producers of finished goods and managers of raw materials brought into their village. This division of labor correlates well with logistical organization seen in Archaic forager models, which show a similar patterning of men and women's tasks and spheres of productive control. Our study uses data from the Harris Site in the Mimbres Valley, NM, where increasing agricultural reliance resulted in a flexible but discernible division of gendered space. We examine artifacts from roofs, floors, and other behaviorally significant contexts to identify instances of gendered manufacture and use of lithic tools. These data are interpreted to provide an engendered view of material production at the Harris Site that provides a fuller picture of daily life in the Mimbres Mogollon Late Pithouse period.

Perttula, Timothy [97] see Jennings, Thomas

Pessoa, Cliverson [25] see Kater, Thiago

Pestle, William [19] see Perez, Elizabeth  
 Pestle, William [19] see Van Meter, Nicole  
 Pestle, William [89] see Wenger, Sarah

**Peters, Ann (University of Pennsylvania Museum) and Jessica Lévy (Independent Researcher)**

[70]

*The Production, Form, and Arrangement of Vegetable Fiber Slings in Late Paracas, Topará, and Early Nasca Contexts*

Slings have a long history in the Andes as a weapon, herding tool and item of personal ornament. They can be traced from ca. 5000 BP until the present day, when they continue to have powerful practical and symbolic roles associated with skill, protection, and leadership. Some 2,000 years ago, the late Paracas, Topará, and early Nasca traditions provide a substantial sample of slings crafted using the leaf fibers of a plant in the Agavoideae subfamily. We have compiled information on sling materials and structure, arrangement in funerary contexts and representation on polychrome ceramics to elucidate aspects of their production process, their gender associations, and diversity in their forms, uses and representation associated with different social groups over time.

**Peterson, Jane (Marquette University) and Michael Gregory (Camp Douglas Restoration Foundation Inc.)**

[182]

*Suburban Geographies of Expansion and Exclusion: Village of Maywood, Illinois*

Suburban communities grew up around major Midwestern cities, including Chicago, by the turn-of-the-century. Suburban neighborhoods were marketed as bucolic, family-friendly havens free from the physical dangers and the psychological stresses of urban living. In Maywood's case, these benefits were initially envisioned exclusively for white residents. Racial segregation was imbedded in the village's 1869 charter and ordinances, replicating the red-lined realities of urban Chicago's Black Belt. Local deed restrictions barred African Americans from purchasing land or homes in Maywood. By the mid-1880s, a restricted, eight-block area on the western margin of the suburb was opened to Black residents. Today, Maywood is a predominantly African American community. Preliminary archaeological investigations were framed by several questions. Is there material from Maywood's early development preserved in residential yards? How do these remains comport with the idyllic vision promoted by Maywood's developers? Are there different archaeological signatures between yards inside and outside of the racially restricted parts of Maywood? How can our work support local projects and organizations interested in historic preservation? Suburbanization and racial segregation are intertwined processes that continue to shape American society in profound ways. This archaeological exploration aims to shed light on both from a quotidian, backyard perspective.

**Peterson, John (University of San Carlos Cebu)**

[154]

*Pacific Mangrove Habitat and Mid-Holocene High Still Stands: Shifting Sands for Neolithic Coastal Settlement*

Tropical Pacific coastal shorelines were subjected to a post-glacial rise above modern sea level by about 2.0 m throughout the region with some local variability from ca. 6,000 years ago until 3,000 and then 2,000 years ago. There may have been a series of punctuated changes in sea level that threatened slow-growing mangrove habitat along shorelines as well as limiting and then exposing backshore terrain for settlement. Current studies in Pohnpei near Nan Madol demonstrate strong resilience to contemporary sea level change in mangrove forests, but punctuated changes may have stranded mangroves in unsuitable environments either above brackish zones or submerged in marine conditions in the region. We examine a variety of settings in the Marianas and in the Philippines to consider changes in human settlement and reticulate coastal migration relative to sea level and mangrove habitat shifts.

**Peterson, Katherine**

[5]

*Entangled Assemblages: The Back Wall at Chetro Kettle*

Chetro Kettle is one of many architectural feats in the Southwest and one of the largest buildings at Chaco Canyon. Each of these buildings encapsulates a plethora of people, planning, innovation, ideologies, effort, skill, and materials. The connections are endless. Chetro Kettle is no different. Even sections of these buildings hold meaning and play a role. The back wall of Chetro Kettle is striking. It ebbs and flows with time, weaving a story of the people around it, even to this day. In this paper, I draw on assemblage theory and entanglement to make a case for what that story is. I will guide us through a territorialization and deterritorialization of the assemblage of the wall: making, use, unmaking, and remaking over time, with its various entanglements and entrapments.

**Peterson, Ryan**

[20]

*Cold Hammered Archaeology: An Experimental Archaeometallurgical Approach to Native Copper Working in the Lake Superior Basin*

Experimental archaeometallurgy has allowed for the reconstruction of past metal production processes that utilize local and regional materials and tools that were available to people who operated them. The re-creation of these past production processes allows for the creation of comparative collections that can be used to help interpret the archaeological record. This project works to reconstruct the production process of native copper artifacts from the Upper Great Lakes, where native copper has been utilized for the past 9,500 years. Native copper is 99% pure elemental copper that was worked through a process called cold hammering and annealing that allowed for the manipulation of metallurgical material without the aid of melting or smelting. Cold hammering instead works the copper at or near room temperature with periodic annealing to recrystallize the metallurgical structure. The re-creation of these methods allows for the documentation of various stages of manufacturing, a deeper understanding of the formation of copper tool manufacturing, and the identification of waste materials produced through the manufacturing process.

**Peterson, Ryan****[137]***Discussant*

Petit, Christophe [31] see Mayeux, Camille

**Petras, Elysia (Temple University)****[166]***Interpreting and Representing Evidence for Interisland Networks of the Enslaved at the Hughes Estate Plantation Site on Anguilla, B.W.I.*

When read against the grain, eighteenth- to nineteenth-century documents provide ample evidence that the enslaved of British Anguilla developed maritime networks of liberation with the enslaved of the nearby island of French/Dutch St. Martin. This presentation will discuss the preliminary findings of archaeological research at the Hughes Estate plantation site that seeks to investigate these interisland social networks forged outside of colonial control. This presentation also explores the application of 3D modeling and hosting digital assets online for purposes of community engagement with heritage as well as representation of the plantation landscape in a way that centers the narratives of the enslaved.

**Petrovic, Vid, James Chatters (Applied Paleoscience and Direct AMS), Dominique Rissolo (University of California, San Diego), David Zollinger (East Tennessee State University) and Blaine Schubert (East Tennessee State University)****[221]***Combining Virtual and Physical Fieldwork: The Recovery of a Submerged Ground Sloth Synsacrum from Hoyo Negro*

Hoyo Negro is a submerged late Pleistocene site whose location and depth within the Sac Actun cave system makes it accessible only to specialist divers. To enable virtual access to this site, we are incrementally constructing a comprehensive digital 3D representation, currently comprising thousands of diver-captured photographs and 19.4 billion photogrammetrically derived 3D points, with coverage at multiple scales and resolutions (sub-millimeter at deposit-scale). We are also developing a visual analysis software platform (Viscore) for hosting this representation and enabling scientists to perform interactive virtual fieldwork. In this paper, we focus on the recovery of the synsacrum of a Nohochichak ground sloth, and on the role of digital methodologies in facilitating this collaborative effort. First, we describe virtual fieldwork-based preliminary recovery planning—highlighting both the challenges that arise (a heavy, bulky, and fragile specimen), and the proposed solution (a conforming support cradle). We then describe the derivation of a CAD-ready reference model of the specimen, suitable for developing cradle designs. We outline the designs considered, and the selection of a simplified design for fabrication. Finally, we describe the development and in-field refinement of the recovery dive plan using the digital site representation, and the successful execution of the recovery operation.

Petrucci, Calvin [159] see VanderVeen, James

Pevny, Charlotte [117] see Smallwood, Ashley

**Pfleger, Gabriella (Archaeology Southwest), Rebecca Harkness (University of Arizona) and Allen Denoyer (Archaeology Southwest)****[175]***An Experimental Comparative Analysis of Classic Mimbres and Salado Pottery*

Both Classic Mimbres Black-on-White (1000–1130 CE) and Salado Polychrome (1275–1450 CE) of southwestern New Mexico are significant material culture trademarks of their times and the region in which they were used. These pottery styles have been revived in the modern age, indicating they remain important to people artistically. However, there is a lack of academic research surrounding a direct comparison of the two production styles for data collection. This project uses experimental methods to create a comparative analysis of both ceramic traditions, examining the materials, tools, and technologies employed by each and how they changed between the two periods of pottery-making. To do this, multiple vessels, primarily bowls, will be made using the same techniques as at the time of their creation, and will include popular elements found in the Mimbres and Salado traditions. The findings will help to determine how and potentially why techniques were either maintained or changed between the Mimbres and Salado periods in the same region, and what that can tell us about the shifting culture of pottery production in southwestern New Mexico.

**Phillips, Amy (Meeteetse Museums) and Kenneth Cannon (Cannon Heritage Consultants Inc.)****[196]***Bison of the Bighorn Basin Project*

In September 2020, the Meeteetse Museums initiated the citizen science project “Bison of the Bighorn Basin” to assemble morphological and paleoecological data from bison crania found within the Bighorn Basin of Northwestern Wyoming. The program focused on the importance of stewardship and protection of the region’s ecological history. This collaboration with the local community yielded 106 of which 22 skulls were submitted to UC-Irvine for radiocarbon assay and light stable isotope analysis. Standard cranial measurements were taken for each cranium and linked to the discovery location. Radiocarbon ages range from 110 to 775 yrs BP. The Museums will host a virtual exhibit incorporating this data into a history of bison in the Bighorn Basin within the context of the larger continent-wide bison history. These types of studies complement wildlife management efforts to reintroduce bison to their former range, as well as provide basic data on the region’s ecological history. The project furnishes information relevant to the return of bison to tribal lands and provides an entry point for non-Native Americans to work toward an understanding

of Native American autonomy and culture today by demonstrating the bison's continuing relationship to Wyoming's landscapes, Native American groups, Tribal sovereignty, language revitalization, and culture.

**Phillips, David (Maxwell Museum of Anthropology), Hayward Franklin (Maxwell Museum of Anthropology), Suzanne Eckert (Arizona State Museum) and Ballagh Jean (Retired)**

[41]

*The Hopi Area Connection at Pottery Mound*

The late prehistoric site of Pottery Mound, in central New Mexico, has strong material ties to the Western Pueblo world. We examine one line of evidence for those ties, the presence of yellow ware pottery from northeast Arizona. Based on previous studies and new data, potential explanations for the presence of that pottery include down-the-line trade, sharing of ritual practice, and migration. The actual explanation most likely involves a combination of these factors, including the existence of a small neighborhood of individuals affiliated with what is now the Hopi area of northeastern Arizona.

Phillips, Erik [56] see Esdale, Julie

Phin, Phakdey [181] see Klassen, Sarah

Phin, Samnang [181] see Klassen, Sarah

**Picard, Jennifer (University of Wisconsin–Milwaukee Cultural Resources Management)**

[227]

*Oneota-Historic Connections at the McCauley Site*

Located on the northwest shore of Lake Winnebago, the McCauley site (47WN0222) is a Woodland, Oneota, and historic Indian habitation and burial site. David Overstreet (1993) included McCauley in his definition of the provisional Dandy Phase, a protohistoric Oneota phase beginning as early as the 1620s. Overstreet argued that McCauley was a locus of Oneota interaction with French and other traders. In 2017, Cultural Resources Management at the University of Wisconsin–Milwaukee conducted excavations at McCauley for a utility project. Seven features were identified, including burials, hearths, and storage pits; one feature potentially pertains to the provisional Dandy Phase component. Material culture recovered during the course of the CRM investigations includes historic trade goods, pottery, lithic artifacts, and faunal remains. These findings demonstrate the continued integrity of the site and provide additional lines of evidence supporting Oneota and historic period connections in the area. This research also underscores the importance of state-level historic preservation laws, including Wisconsin's burial sites law and state historic preservation law.

Pierce, Daniel [167] see Navas-Méndez, Ana

Pigati, Jeffrey [184] see Holliday, Vance

**Pike, Jean (A/LRC | Architecture/Landscape Research CoLab)**

[5]

*Classic Period Architecture of the Galisteo Basin, New Mexico: Long-Distance Connections to Mesoamerica and Cahokia?*

In 1927, when the Pecos Classification was first established, Pueblo III architecture was considered to be the height of pueblo development on the Colorado Plateau. While the large-scale Pueblo IV sites that followed afforded new integrative social, economic, political, and religious systems and reached sizes that were 10 or more times those of Pueblo III Chaco Canyon great houses, their development remains unclear. The research presented in this paper is based on the correlation and analysis of recent lidar data and maps produced by archaeologist Nels Nelson, first published in 1914. This research establishes that architecture and planning practices implemented at Chichen Itza were later utilized at the Galisteo Pueblos of Colorado, Largo, San Cristobal, and Shé. In addition, clear similarities between Pueblo Shé and Cahokia are shown. Previous groundbreaking research that connected the US Southwest to Mesoamerica includes that of Dr. David Wilcox on the Mesoamerican origins of Hohokam ballcourts and Dr. Patricia Crown on the presence of cacao and procurement of macaws, but in each of these cases specific source or haplogroup locations have yet to be determined. This research draws geographical and ideational links from Chichen Itza and Cahokia to the Classic period Galisteo Basin, NM.

Pike, Jean [208] see Leishman, Deborah

Pilaar Birch, Suzanne [198] see Veres, Matthew

**Piscitelli, Matthew (SEARCH / Field Museum), Katherine Hodge (Project Archaeology) and Courtney Agenten (Project Archaeology)****[146]***Investigating Rock Art in the Classroom*

While not a typical subject in precollegiate classrooms, archaeology offers an engaging way to teach social studies, history, and science, among other subjects. Project Archaeology, a national heritage education program for educators and their students, has experienced relative success integrating archaeology in classroom settings by developing curriculum that uses archaeological inquiry and meets state standards. This presentation will introduce Project Archaeology through the lens of its Investigating Rock Art curriculum designed for grades 3 through 5. The curriculum currently focuses on a handful of examples, but this presentation will introduce future plans as well as a variety of educational and engaging resources to inspire further scholarship and preservation efforts among those interested in rock art more broadly.

Piscitelli, Matthew [129] see Bria, Rebecca

**Pitblado, Bonnie (University of Oklahoma)****[10]***The Earliest Use of the Highest Landscapes of the North American Cordillera*

Mark Aldenderfer has contributed much to our understanding of the earliest human occupations of some of the highest mountains in the world. In that spirit, this paper overviews what we know about the earliest uses of the very highest reaches of North American Cordilleran landscapes. Though they do not top out at the extreme-hypoxia-inducing elevations of the Andes, Tibetan Plateau or Himalayan Arc, where Aldenderfer has focused much of his research, the highest peaks of the Pacific Coast Ranges, Sierra Nevada, and Rocky Mountain nevertheless posed real challenges to those wishing to occupy them. By better understanding the timing and nature of the earliest "highest of the high" sites in North America, we can begin to unravel PaleoIndigenous motivations for spending time in the North American high country.

**Pitezal, Todd (University of Arizona)****[118]***In Honor of Drs. Michael E. Whalen and Paul E. Minnis: The Science Cruisers*

It has been a pleasure and honor to work for and learn from two scholars that transcended the International Four Corners. Drs. Whalen and Minnis cruised northwest Chihuahua and brought their science to the understudied hinterlands of the famous site of Paquimé. In tow were dozens of students, some of whom produced theses and dissertations about Casas Grandes. I am one of those students. In this presentation I will share my experiences with and lessons learned from El Mago and Dr. Ciencia.

**Pitezal, Todd (University of Arizona)****[118]***Chair*

Pitts-Olmedo, Karin [24] see Nocerino, Eric

Pizá, Abiud [221] see Meinecke, Helena

**Planto, Rebekah (William & Mary)****[80]***Making Space and Filling in the Gaps: Evidence from Post-emancipation Tenant Households at Bacon's Castle, Surry County, Virginia*

Situated downstream from Jamestown on Virginia's persistently rural Southside, with extant architecture and archaeological collections spanning the seventeenth to twentieth centuries, the Bacon's Castle site in Surry County affords unique perspectives on over 300 years of colonial and postcolonial material, social, and political-economic entanglements. Captive African people were brought to the plantation by the 1670s alongside bound English servants; and, by the turn of the eighteenth century, families and individuals enslaved under increasingly racist laws comprised the majority of the labor force and population. Analysis of overlooked nineteenth- and twentieth-century artifacts and material traces from inside the house and surviving quarter complements recent work by historians and descendant community members, particularly shedding new light on lives of those who resided in and around Bacon's Castle during and after Emancipation. The legal end of slavery and decline of the plantation gave way to a tenancy period, when African- and European American laborers and sharecroppers frequently lived side by side—albeit, not in equitable conditions—as the primary residents under wealthy, absentee landlords. The co-presence of remnants from multiple periods invites investigation into lives and relationships across time, between residents and their historically complex surroundings, and between past and future generations.

Plattner, Alain [8] see Filoromo, Steve

**Plekhov, Daniel (Brown University), Parker VanValkenburgh (Brown University), Carol Rojas Vega (Independent Researcher) and Alexis Reátegui Díaz (Independent Researcher)**

**[214]**

*The Sustainability of Agricultural Terraces: Three Scales of Evaluation from Chachapoyas, Peru*

Agricultural terraces are characterized by several attributes that generally suggest their long-term sustainability. Terraces can be remarkably enduring, provide benefits for managing erosion and hydrology, and enhance agricultural productivity. Many terraces are built gradually, in these cases only requiring small inputs of labor or material resources per year. These characteristics, as well as their use by many pre-industrial agricultural societies worldwide, collectively suggest that terraces may represent a viable and sustainable strategy for rehabilitating rural areas today. All of these characteristics apply to the terraced landscapes of Chachapoyas, in northeastern Peru. As this paper will argue, however, there must be caution in assuming that these characteristics equate with sustainability, or that the long-term success of terraces in the past signifies their appropriateness for implementation in the present. We examine the sustainability of terraces at three scales. First, as landscape modifications and architectural features, noting that terrace permanence is variable, conditional, and in some cases undesired. Second, as components of different kinds of agricultural strategies, some of which may be sustainable and some not. Finally, as dependent on the broader economic and political context in which all agriculture is practiced. We therefore argue for context specific evaluation and long-term study.

**Plog, Stephen (University of Virginia), Christopher Schwartz (Northern Arizona University), Douglas Kennett (University of California, Santa Barbara) and Patricia Gilman (University of Oklahoma)**

**[14]**

*Birds of the Sun: Scarlet Macaws in the Southwestern United States and Northwestern Mexico and Their Relationships to Mesoamerica*

The presence of large numbers of scarlet macaws native to the tropical rain forests of Mesoamerica at some sites in the southwestern United States and northwestern Mexico (SW/NW) has been one of the clearest examples of the relationship between the SW/NW and Mesoamerica. Archaeologists have previously conducted important studies of scarlet macaws at prehispanic SW/NW settlements, but numerous questions remain. Using new summaries of information on scarlets in several regions of the SW/NW, we address various questions. For example, we show that scarlet macaw contexts, patterns of use and deposition, and depictions on ceramics differ from Mesoamerica. In addition, there is remarkable variation across the SW/NW and through time as well. We use diverse analytical methods—isotope analysis, radiocarbon dating, and aDNA sequencing—and we explore what these methods can help us understand about how prehispanic people procured and raised these birds.

Plomp, Kimberly [169] see Collard, Mark

Pluckhahn, Thomas [39] see Cordell, Ann

**Pluta, Paul (University of Florida)**

**[194]**

*Thirty Years of Research on the Archaic Period in Coastal Moquegua, Peru*

Over the last 30 years, investigations of the Archaic period along the coast of the Department of Moquegua, Peru, have revealed a rich archaeological and paleoclimatological record extending through the Archaic. This paper reviews the current state of knowledge of this period by examining several of the major themes investigators have explored. First, the region exhibits great economic diversity in the exploitation of maritime resources, illustrating adaptive flexibility within a specialized economy. Second, the study of massive debris flow deposits at several archaeological sites demonstrates the potentially catastrophic nature of El Niño events and provides a key proxy for El Niño's past activity. Third, assessments of identity and ethnicity in regional mortuary traditions reveal cultural affiliation with the Chinchorro tradition of northern Chile. Finally, regional occupational history and patterns of site distribution illustrate long-term occupational continuity. Together, these research trajectories have shown the inhabitants of the Moquegua coast were exceptional maritime specialists who utilized diverse marine and coastal adaptations to maintain cultural resilience throughout the Archaic.

Podrug, Emil [122] see McClure, Sarah

Poe, Kaitlyn [129] see Garvey, Raven

**Poister, Nicholas (University of New Mexico), Laura Baumann (Oregon State University), Andrew Van Cleve (National Park Service) and Steve Baumann (National Park Service)**

**[207]**

*The El Malpais Lava Fields as a Bighorn Sheep Refugium in the Recent and Distant Past*

The depression of artiodactyl populations in tandem with agricultural intensification and settlement aggregation has been a recurrent motif in zooarchaeological studies of the precontact US Southwest. While bighorn sheep (*Ovis canadensis*) are widely regarded as having been extirpated from northwestern New Mexico by the turn of the twentieth century, radiocarbon evidence documents a population persisting in what is now El Malpais National Monument until at least the 1950s. Oral histories collected by the Park Service reveal that local Indigenous peoples maintain an elaborate set of beliefs and practices associated with bighorn and their relationship to the volcanic landscape features of El Malpais. Additionally, the deepest recesses of certain lava tube caves within the monument safeguard a record of past human-animal interaction in the form of faunal bone caches. The rugged topography and

verdure of the lava fields may have allowed bighorn to sustain a breeding population through periods of high human settlement density, including Pueblo II–III, providing the ancient inhabitants of the area access to an otherwise scarce resource. In the millennia prior to the delineation of the national monument boundary, the El Malpais landscape itself may have functioned to preserve biodiversity, even under the pressure of extractive practices.

**Poister, Nicholas (University of New Mexico)**

[207]

Chair

Poister, Nicholas [207] see Earl, Dale

**Polanyi, Tamas (Sandbox Archaeology) and Shelby Manney (Arizona Army National Guard)**

[78]

*Remote Sensing and Pattern Recognition in Cultural Heritage Management: Investigations at the Florence Military Reservation, Arizona*

In the past few years there has been a concentrated effort on behalf of the Environmental Management Office of the Arizona Army National Guard to develop new survey and management protocols that integrate conventional and instrumental survey methods within a coherent framework. Part of this effort has been the application of aerial survey methods in broader cultural resources management efforts. Systematic assessment of aerial photography and lidar survey data shows the utility of these methods to provide relevant archaeological information complementary to conventional surveys. In this paper we present the use of high-resolution surface models and automated pattern recognition to identify previously undetected Hohokam earthen features.

**Politis, Gustavo (INCUAPA-CONICET, Argentina)**

[116]

*The First 2,000 Years in the Pampas Region of Argentina*

The Pampas of Argentina were occupied by humans at ca. 14,000 cal BP. Despite intensive, multidisciplinary research in the last decades, no evidence has been found for earlier periods. In the following 2,000 years, profound cultural changes occurred in the region, bringing new technologies and probably new hunting strategies; by ca. 12,000 cal BP, the eastern Pampas was fully occupied by hunter-gatherers with extended home ranges and the Fishtail projectile point being the most popular hunting weapon. In this poster, the current archaeological evidence and new radiocarbon dates related to the early peopling of the Pampas will be summarized and discussed concerning the expansion of humans in South America. Moreover, new ancient genomic results will be presented and integrated into the actual archaeological data. The summarized evidence does not support a pre- or para-Late Glacial Maximum human occupation of the region and agrees with the current paleogenomics models related to the expansion of *Homo sapiens*.

**Polk, Sara, Benjamin Cross (Ohio State University) and Marcus Schulenburg (Archaeological Research Institute)**

[65]

*Beyond Four Walls: Seeking Early Fort Ancient Households through Refitted Vessel Fragments*

Households are constructed through people's relationships within and beyond the residential structure. These relationships are reflected in the archaeological record. In this study, we examine the presence of households within an early Fort Ancient village in southeastern Indiana. The Guard Site (12D29) is home to 30–40 structures and presumably a similar number of households. We are presented with the opportunity to study two adjacent structures and the intervening space through the lens of households. By investigating the spatial distribution of features and associated pottery vessels, we examine household functions and roles beyond four walls. Our results offer insights into small-scale social relations within a larger village structure during a dynamic period of cultural change in the Ohio River Valley.

Polk, Sara [69] see Raab, Bailey

Pollack, David [30] see Renson, Virginia

Pompeani, David [15] see Wilson, Jeremy

**Ponce, Jocelyne (Tulane University) and Marcello Canuto (Tulane University)**

[218]

*Diversity and Complexity across Settlement Densities at the Classic Maya Center of La Corona*

The recent application of lidar technology across the Maya Lowlands has revealed substantial variability in how populations were distributed across the landscape. The comprehensiveness of these data provides the unique opportunity to define differences in socioeconomic organization across an entire settlement system. In this paper, we examine how social and economic lifeways varied across a continuum of settlement densities surrounding the Classic period Lowland Maya center of La Corona. As a medium-sized center located in a sparsely populated region in northwest Petén, La Corona is composed of a ceremonial-administrative core surrounded by a patchwork of residential groups composing concentric rings of progressively less dense settlement. To assess how settlement density impacts the daily life within an ancient Lowland Maya center, we compare the spatial layout, architecture, specialized production, and resource access of three supra-household groups located in the urban, peri-urban and rural density

"rings" respectively. This comparison will help determine whether settlement density was a relevant factor in the urban organization of a lowland Classic Maya center.

**Ponkratova, Irina (Doctor)**

[135]

*Moderator*

[112]

*Discussant*

**Pool, Christopher (University of Kentucky) and Michael Loughlin (Cardno)**

[145]

*Mazapa and La Sierra in Regional Context: Results of the RRATZ Survey*

Research conducted by the Recorrido Regional Arqueológico de Tres Zapotes (RRATZ) identified Postclassic and colonial occupations at Mazapa and La Sierra, and places those occupations in broader regional and temporal contexts. Here we describe results of the RRATZ project, which used a combination of traditional and lidar-assisted pedestrian survey to reconstruct over 3,000 years of settlement history over a ca. 400 km<sup>2</sup> area of the Eastern Lower Papaloapan Basin (ELPB), between the Tuxtla Mountains and the Papaloapan delta. Late Postclassic settlement at La Sierra and Mazapa reflect a partial rebound of regional population following an Early Postclassic nadir, and a clustering of settlement on the important Río Tecolapan transportation route prior to and during incorporation into the Aztec Empire. Gabriela Montero Mejía's research, reported in this session, confirms continuity of occupation into the colonial period, strengthening the hypothesis that these and other sites provided labor for the nearby sugar mill (*ingenio*) established by Cortés in 1524.

**Pool, Michael (Austin Community College)**

[160]

*A "Just-So" Story: Mimbres Disorganization*

The Mimbres Demographic Collapse has been described as a population realignment and not as a change in the number people. Instead it was a change in population distribution. In at least in my limited reading of recent publications, two things have not been addressed: (1) Why was the regional demographic restructured? (2) Why was the San Lorenzo reach of the Mimbres River (north) abandoned? For a number of years, I have pondered why these occurred. Here, I propose some explanations; however, they should be considered as a Rudyard Kipling "Just-So" story: How the Leopard Got His Spots? That is, they account for the data we know and (hopefully) sound good. But they should not be seen as established fact or an explanation. They are at best hypotheses. We have a problem and propose an explanation of why. However, they have not been tested.

Pependorf, Kim [89] see Wenger, Sarah

Porat, Roi [85] see Lazagabaster, Ignacio

**Porcayo-Michelini, Antonio (Centro INAH Baja California)**

[79]

*A Proposed Alternative for the Use of Paleoindigenous "Crescents"*

In North America, which includes the northern portion of present-day Mexico and the United States, artifacts made of flaked stone known as "crescents," and associated with timeframes between 12,000 and 7000 BC, have been the subject of various interpretations of their use. These interpretations range from the ritual to the simply utilitarian in the daily tasks of the hunter-gatherer groups that made them. Making use of ethnographic analogy and with specific reference to archaeological specimens from Baja California, Mexico, this paper proposes a new line of research to be explored to determine which of these purposes could have been among the true function for these enigmatic artifacts.

Porcayo-Michelini, Antonio [131] see Ainis, Amira

Porter, Douglas [215] see Guebard, Matthew

**Portman, Katherine (University of Arizona), Donna Glowacki (University of Notre Dame) and Sean Field (University of Notre Dame)**

[208]

*Is Bigger Data Better? Low- versus High-Resolution Dating Classifications in Mesa Verde National Park*

Archaeologists working in the Four Corners region of the North American Southwest are fortunate to have a well-established ceramic chronology calibrated by dendrochronological dates. The earliest and most famous chronology is the Pecos classification, which divides the deep history of Ancestral Pueblo people into 150- to 200-year periods based on architecture and artifact assemblages. In subsequent decades, archaeologists have attempted to further divide Ancestral Pueblo history into shorter time periods using techniques such as mean ceramic dating. A recent major contribution to this effort is the Village Ecodynamics Project (VEP), which combines mean ceramic dating and Bayesian statistics to model ancient occupation on generational rather than

century-scale timeframes. Higher-resolution models like the VEP are generally regarded as blanket improvements over their lower resolution forebears, but direct comparisons between the two are uncommon. In this paper, we statistically compare occupation of sites in Mesa Verde National Park using reconstructions built using Pecos classification, mean ceramic dating, and VEP methods. While the three dating classifications all have strengths and weaknesses, they are measurably different in how they portray settlement patterns over time. This has major implications for how we choose and apply seriation methods and how they should be interpreted.

**Porubcan, Paula (Illinois State Archaeological Survey) and Thomas Loebel (Illinois State Archaeological Survey)**

[164]

*The Huber Site: A Frontier Indigenous Settlement at the Edge of European Contact*

Dating between CE 1450 and 1650, Huber (11CK1) is the type site for the Upper Mississippian Huber Phase identified in the Western Great Lakes region. Occupied at a critical time in indigenous Native American history, this late prehistoric village contains some of the earliest European trade goods found in Illinois. The site was briefly investigated in 1929 and again in 1957, but since then thought to have been virtually destroyed by looting and urban development. Recent field investigations by the Illinois State Archaeological Survey (ISAS), completed between 2017 and 2020, confirm that large portions of the site remain intact and preserved on adjacent public lands and residential yards. Discoveries include house basins, possible ridged field structures, well-preserved organics, ceramics, chipped and ground stone tools, and additional trade items. Current collaborations with the Forest Preserve of Cook County (FPCC), GreenCorps Chicago, the Field Museum, avocational collectors, and local residents have provided opportunities to explore what life was like in Chicago immediately prior to a physical European presence in the area. Additionally, hands-on fieldwork days for elected officials have allowed us to focus attention on legislative support for archaeological site preservation and research in metro Chicago.

**Porubcan, Paula (Illinois State Archaeological Survey)**

[182]

Chair

**Posselt Santoyo, Emmanuel**

[123]

*Paisaje en movimiento: Peregrinaciones contemporáneas y pre-coloniales*

En esta plática propongo la idea de un paisaje en movimiento y reimaginarlo como un conjunto de líneas en movimiento y lugares que se entrelazan de diferentes formas a través del tiempo. Comúnmente, desde la arqueología se ha entendido al paisaje un tanto estático, y como un espacio contenedor de los sitios arqueológicos. Ejemplo de esto son los mapas, los cuales muestran una serie de dibujos que indican los sitios arqueológicos, dejando de lado los movimientos o flujos de seres entre los sitios. Para explicar esta idea, partiré del estudio de las líneas que se generan durante las peregrinaciones, tanto en la actualidad como en tiempos precoloniales. Para ejemplificar la primera, retomare la peregrinación contemporánea al santuario del Cerro de Pedimento localizado en Santa Catarina Yosotitlán, Mixteca Alta, Oaxaca. Este primer ejemplo me brindará las pautas para proponer un tipo de peregrinación en el Posclásico (1000-1521), la cual ejemplificaré con datos obtenidos durante un recorrido arqueológico en la misma región. En este sentido, la peregrinación puede ser entendida como una gran línea en movimiento que pasa a través de lugares, la cual le ha dado y sigue dando forma a un paisaje.

**Potter, Ben (University of Alaska Fairbanks)**

[26]

*Ancient Burials at Upward Sun River, Central Alaska*

In the late summer about 11,500 years ago, probably in the space of a few weeks, three young Paleoindian children died and were buried in a residential camp alongside Xasaa Na' (Upward Sun River). An infant and neonate were buried together with grave goods below a central cooking hearth, and later a ~3-year-old child was cremated and buried above the same feature. I explore the lifeways of the Ancient Beringians that summer, reconstructed through zooarchaeology, stable isotope, spatial, and artifact analyses and discuss implications of the mortuary treatment of these individuals.

Pouley, Cheryl [114] see Edwards, Briece

Power, Mitchell [204] see Davies, Benjamin

**Powers, Erin and Christopher Schmidt (University of Indianapolis)**

[71]

*Dental Microwear Texture Analysis of Roman Diet in Apulum (Alba Iulia, Romania)*

The current study analyzes dental microwear texture analysis (DMTA) of people from the Necropolis Podei in Apulum, Roman Dacia ( $n = 31$ ). Roman Dacia was the last territory incorporated into the Roman Empire in the early second century AD and it was abandoned around the AD 250s. This study aims to suggest that the microwear texture values within the sample population would be statistically indistinguishable because the Roman diet is described as being consistent across the Empire with similar foodstuffs including cereals, olive oil, wine, fruits, vegetables, nuts, seeds, dairy and a little meat. Moreover, the values should be similar to other archaeological farming sites described in Schmidt et al. (2019). The DMTA variables included complexity (surface unevenness), anisotropy (similarity of feature directionality), textural fill volume (the surface removed by dental wear), and scale of

maximum complexity. Statistical methods calculated for this study indicate elevated complexity values when compared to the Schmidt et al. (2019) data; their data are similar to people with mixed farming and foraging economies. In the end, this project detected an unforeseen intra-site dietary nuance within the Necropolis Podedi.

**Powis, Terry (Kennesaw State University), George Micheletti (University of Central Florida) and Sheldon Skaggs (Bronx Community College, CUNY)**

[153]

*Politicians Have Only Themselves to Blame: Cycling and Recycling Power for Two Millennium at Pacbitun, Belize*

The ancient Maya site of Pacbitun, located along the southern rim of the Belize River Valley, was occupied for nearly 2,000 years (900 BC–AD 900). It began as a small farming community in the early Middle Preclassic and grew to become a medium-sized polity in the Late Classic. During its humble Preclassic beginnings, emerging leaders at the site engaged in long-distance trade and exchange that brought sustained wealth to the early community. Pacbitun continued to grow during the Late Preclassic and Early Classic becoming more politically significant at the local and regional levels during the latter period. While geographically isolated, the site was politically engaged with its neighbors both near and far throughout the Classic period, yet it never appears to achieve the level of political (semi)autonomy of other nearby sites. This presentation will examine evidence of Pacbitun's social relationships to better understand how dynastic activities shaped royal aspirations throughout its apogee in the Late Classic.

Powis, Terry [8] see Branch-Raymer, Leslie

Powis, Terry [18] see King, Adam

Powis, Terry [54] see Micheletti, George

Powis, Terry [89] see Skaggs, Sheldon

Pradeau, Jean-Victor [155] see Chanteraud, Claire

**Praet, Estelle (University of York), Raveena Tadoria (University of York) and John Schofield (University of York)**

[50]

*Trouble in Paradise: Archaeology's Role in the Multidisciplinary Study of Waste Landscapes in and around Galapagos*

Since humans first discovered Galapagos in 1535, the archipelago has been impacted by their behavior. In recent years, marine pollution has not spared the UNESCO World Heritage Site, its impact being evident on land (Jones et al. 2021) and at sea (Alfaro-Núñez et al. 2021). The presence of plastics threatens its unique wildlife and World Heritage status. In 2018, a Science to Solutions workshop reflected on the potential of archaeological object-narratives methods (Schofield et al. 2020) to help mitigate this impact. Considering plastics collected on the beach as artifacts enabled the investigation of behaviors contributing to waste landscapes of Galapagos, alongside oceanographic models that identified South America and fishing fleets as sources of plastics reaching the archipelago (van Sebille et al. 2019). Galapagos plastic pollution is a regional issue shaped by industrial fishing and continental waste mismanagement. A detailed understanding of the archipelago waste landscapes, with the contribution of archaeology, is helping to address marine pollution in a complex legal framework comprising the Galapagos Marine Reserve and Exclusive Economic Zone both managed by Ecuador and the high sea where international law applies. In this paper, we will present how archaeology informs policy and law makers to build a plastic-free Galapagos.

Praet, Estelle [64] see Delaere, Christophe

Praet, Estelle [138] see El Hadjen, Mathilde

Pratt, Lauren [129] see Garvey, Raven

Prendergast, Mary [186] see Quintana Morales, Eréndira

**Prentiss, Anna (University of Montana), Thomas Foor (University of Montana), Nathan Goodale (Hamilton College), Ashley Hampton (University of Montana) and Alysha Edwards (University of Montana)**

[83]

*Cache Pits of Housepit 54, Bridge River Site: An Analysis of Lithics, Faunal Remains, and Geochemical Signatures*

Large volume cylindrical pits, assumed to be storage and refuse-disposal features, are common on housepit floors in the Plateau region of North America's greater Pacific Northwest. Sediments within the pits may include a rich array of lithic artifacts, fire-cracked rock, and faunal and floral remains along with geochemical and isotopic signatures reflecting on the histories of activities in and around those contexts. Because such features are often in "kitchen" areas they provide an excellent opportunity to explore Indigenous food-related activities and associated technological behavior. Here we present results of a comprehensive analysis of 15 cache pits from the deeply stratified Housepit 54 at the Bridge River site, British Columbia. Analysis of inter-assembly variability suggests a pattern of stability and change in cooking and tool use shifting from a focus on fish-related processing and cooking to a greater emphasis on mammals. Geochemical and isotopic analyses of pit sediments provide additional insights into the nature of pit function and kitchen activities.

Preston, David [144] see Wheelbarger, Linda

Prevedoros, Paul [218] see Fletcher, Roland

Prevedorou, Eleni-Anna [226] see Hannigan, Elizabeth

Prévost, Marie-Annick [109] see Gates St-Pierre, Christian

**Prévost, Marion (Institute of Archaeology, Hebrew University of Jerusalem)**  
[191]

*Use of Space and Site Function(s) in Unit III of the Middle Paleolithic Open-Air Site of Nesher Ramla, Israel*

This presentation describes the results of an intra-site spatial analyses of the open-air mid-Middle Paleolithic site of Nesher Ramla, Israel (ca. 125–120 ka). The Unit III represents an excellent case study for analyzing human use of space due to its rich lithic and faunal assemblages found in context of well-defined spatial features, such as hearths and anthropogenic artifact accumulations identified during the excavation as well as lithic refits. Two distinct areas were identified in Unit III, possibly representing different activity areas with different intensities of use. The north area of the site, composed of small distinct accumulations of bones, stones, and a few lithic artifacts, was likely used as a task-specific zone for butchering activities. The center/south area, composed of dense artifact accumulations associated with combustion features, probably represents a domestic zone, in which several activities took place, e.g., flint knapping, bone processing, and animal consumption. We suggest that both areas were used contemporaneously and were complementary to each other. Unit III at Nesher Ramla likely represents a frequently visited “field camp” (i.e., a palimpsest) for a certain duration, in which hominins performed a series of specific and daily life activities.

Prévost, Marion [191] see Paixao, Eduardo

Prewitt, Elton [213] see Keene, Joshua

**Price, Neil (University of Uppsala)**  
[25]

*Pirate Utopias? Exploring Viking “Armies” as Aspirational Politics*

The Viking as pirate is one of the oldest interpretational tropes connected with the predatory maritime activities of the Scandinavian peoples between ca. 750 and 1050 CE. Over the past decade, however, this has gained new theoretical force through comparisons with paradigms of piracy drawn from later times and contexts, embracing the concept of hydrarchies and the notion of pirate communities as forming discrete social worlds. With their regional bases on the great rivers of Frankia, and the many winter camps of the British Isles, there is also another sense in which the Vikings prefigure the Early Modern pirates, in creating physical embodiments of their lifestyle by building special kinds of safe havens. Places like the so-called Republic of Pirates in the Bahamas (1706–1718), and several others, were consciously politicized and modeled on the utopian communities created by writers such as Francis Bacon, Henry Neville, and of course, Thomas More. It is in this context that the paper explores the archaeology of Viking camps: the mobile, multiethnic “armies” that occupied them, their strategic interactions with local populations, and the workings of what anarchist thinkers have termed “temporary autonomous zones.”

**Price, Seth (University of Arkansas) and Carlos Zapata Benites**  
[214]

*Echoes of Then or Symptoms of Now: Raised Field Cultivation in North Coastal Peru*

This research investigates the relationship between sustainable agricultural intensification, settlement dynamics, and anthropogenic landscapes in the Casma Valley of north coastal Peru. The primary focus is to assess why Late Chimú (AD 1300–1470) societies in the Casma Valley converted 700 ha of land into raised agricultural field systems, understand the cultural processes that were key to field operation, and determine how this information can contribute to modern sustainable development. Diverse but detailed data on soil composition is used to isolate soil conditions that represent ancient human activity from modern processes, which is sorely needed in archaeological projects. This past to present spectrum is explored to look at modern anthropogenic soils and the long-term repercussions of raised field cultivation. The integration of multisensor geophysical methods used here has the potential to advance remote sensing approaches, and a new methodology for low-cost thermal photogrammetry is used to assess soil moisture content and field drainage system operation.

**Price, Seth (University of Arkansas)**  
[137]  
*Discussant*

**Prieto, Gabriel (University of Florida)**  
[88]

*Evidence of ENSO-like Events during the Late Early Horizon (400–200 cal BC) in Huanchaco, North Coast of Peru*

Salinar (400–200 cal BC) is the social phenomenon that occurred after the so-called collapse of the Chavín Sphere of Interaction in the north coast of Peru, Central Andean Region. Labeled as a period of “transition,” it has been suggested that this was the time for the emergence of early urbanism, the intensification of warfare, and full-time craft specialists’ development. There is a consensus that during Salinar (at some point between 400 and 200 cal BC), mega-ENSOS have recurrently affected the Peruvian north coast. Recent excavations in Huanchaco, Moche Valley, north coast of Peru provide compelling information for the recurrent presence of

ENSO events during the 400–200 cal BC period. This presentation discusses data gathered from zooarchaeology, ethnobotany, and geoarchaeological studies, concluding that overall, during Salinar the weather was more humid, warmer, and unstable than previously thought, leading to the conclusion of recurrent ENSO-like events. It also suggests a more active interaction between the coast, the highlands, and the upper rain forest (perhaps even the Amazonian region).

**Prieto, Gabriel (University of Florida)**

[192]

Chair

Prieto, Gabriel [155] see Aldama, Wilder

Prieto, Gabriel [129] see Flores De La Oliva, Luis Alberto

Prieto, Gabriel [192] see Lau, George

**Primeau, Kristy (NYS DEC)**

[211]

Moderator

Pringle, William [24] see Wescott, Konnie

**Priola, Victoria (University of Iowa)**

[70]

*Experimental Studies to Determine the Role of Ceramic Crescents in Textile Production from Iberian Copper Age Sites*

Ceramic crescents found at Copper Age settlements in Southwestern Iberia (fourth to third millennium BCE), which weigh less than 100 g and are perforated on each end, are often associated with textile production, although their function remains uncertain. A variety of uses have been suggested for similar crescents from ancient contexts, including band weaving, warp twining, and warp-weighted weaving. This poster expands on experimental work I conducted with reproductions of crescents that suggest these objects are not heavy enough to function optimally when weaving with wool on a warp-weighted loom with two rows of loom weights. This poster presents the results of additional experimental weaving and twining research using the same replica crescents with alternative set-ups and flax fibers. This research suggests that while these crescents were not likely ideal for band weaving, they could have been used for both warp twining and warp-weighted weaving with a single row of loom weights when weaving with finer threads. This research, in combination with contemporary objects that may represent textiles, like the engraved slate plaques, provides a look at the possible types of fabrics that could have been produced during the Copper Age in Southwestern Iberia, when textile remains are extremely rare.

**Proctor, Kathryn (University of Memphis)**

[160]

*Small-Scale Mississippian Settlements Revealed through Geophysical Surveys in Southwestern Tennessee*

The interior uplands of southwest Tennessee consist of several Early-Middle Mississippian (AD 1050–1350) multi-mound centers once thought to be vacant ceremonial centers based on sparse surface artifacts and dismal results of test excavations. Around a decade ago, the first magnetometry survey was carried out by the University of Memphis at the Ames site (40FY7), followed by the nearby Denmark site (40MD85) two years later. Magnetometry and subsequent ground-truth excavations revealed these vacant centers were Early-Middle Mississippian towns with permanent residential populations. In the years following the initial surveys, a strategy combining systematic surface collection and magnetometry has been carried out within 10 km of Ames to locate and further investigate small-scale settlements to develop a Late Prehistoric settlement model for the region. This poster presents the results of several magnetometry surveys in the study area to highlight the utility of this survey strategy for investigating small-scale Mississippian period settlements.

Proffitt, Alexa [136] see Razo, Mikaela

Prowse, Tracy [17] see Avery, L. Creighton

**Prufer, Keith (University of New Mexico) and Douglas Kennett (University of California, Santa Barbara)**

[153]

*Early and Middle Holocene Human Population and Cultural Ecology in the Maya Lowlands*

Ongoing research at rockshelter sites in the Maya Mountains of Belize is changing how we view the early foragers and farmers in the Neotropics. Humans utilized these sites before 12,500 cal BP subsisting on hunting, freshwater resources, and C<sub>3</sub> plants. The earliest burials descended from Native Americans who migrated southward from the western United States into Central and South America before 10,000 cal BP. These founding lineages formed distinctive communities across the Neotropics by 7000 cal BP and soon after began intensifying food production. Across the Neotropics microbotanical data suggest cultigens, including partially domesticated maize, were part of human food webs by 7,000 years ago but isotopic data from our study indicates maize was not an appreciable part of the diet prior to 4700 cal BP, a millennia later than in South America. We hypothesize that productive varieties of maize were introduced into the Maya Lowlands in concert with a previously unknown migration from the Isthmo-Colombian region

between 6000 and 5000 cal BP. DNA evidence for this migration is found in skeletons dating after 5000 cal BP and is still harbored in modern Maya-speaking populations. These events led to the complete adoption of maize as a staple grain by 4000 cal BP.

Prufer, Keith [47] see Ray, Erin  
 Prufer, Keith [54] see Thompson, Amy  
 Prufer, Keith [26] see Trask, Willa

**Pryor, John (CSU–Fresno) and Waylon Coats (Chicken Ranch Rancheria)**

[21]

*Toward a Miwuk Archaeology*

This poster is an update of an ongoing collaborative process to create a new archaeology rooted in a Native American tradition of the people who created the archaeological deposits, based in a Miwuk sense of time, space, and values. Sadly, this process was interrupted by the murder of Gaylen Lee, who I had been working with. This tragic loss closed certain doors but opened new possibilities and partnerships. Because it is a fundamental truth that humans create the worlds we live in through culture, if we are to understand a people through the archaeological evidence they left behind, we must view this evidence in their concept of time and space, not Western European concepts. Thus, archaeologists must get away from the artificial concept of sites and rather looks for interconnections. We need to look at landscapes and land uses. Our chronologies must be rooted in Native American time rather than Western European categories. Finally, we need to create an archaeology that embraces Native values. We must show respect for artifacts not as objects, but imbued with the spirit of those that made them.

**Przybyla, Joy, Dominique Rissolo (University of California, San Diego) and Jeffrey Glover (Georgia State University)**

[177]

*Chen Mul Modeled Effigy Censers, Maya Caves, and Their Relationship with Ritual Practices: Evidence from the Central Coastal Region of Quintana Roo, Mexico*

Like the subterranean construction and use of ancient Maya shrines and altars, the presence of incense burners in caves provides unequivocal evidence of ritual practice. The part mold-made, part modeled production process associated with the Chen Mul incense burners created an assortment of Maya gods readily available for assembly. Therefore, deity veneration is highly probable, and the effigy censers have been found in various ritual contexts across the Yucatán. Ongoing research in the caves of the central coast of Quintana Roo has reported Chen Mul censers in subterranean environments, including cave shrines and altars. By carefully examining the attributes of the Chen Mul Modeled censers, we identify which deities were present in cave ritual contexts. This, in turn, provides a richer understanding of the variety of rituals carried out in these sacred, subterranean places.

**Puckett, Neil (SEARCH) and Sunshine Thomas (AmaTerra Environmental)**

[213]

*This Lacustrine Life: A Predictive Model for Site Locations across the Walker Lake Basin*

Recent work in the Walker Lake Basin has expanded our understanding of the paleolandscape, the distribution of archaeological sites, and the ages and technologies associated with sites. These data provide a strong foundation for modeling perennial lacustrine landscape use and the associated forager adaptations across the western Great Basin through time. Future survey in the region is required to test the patterns observed in the Walker Lake Basin. In anticipation of this work, we develop a statistically based geospatial predictive model for site presence founded on the distribution of known sites relative to the local landscape. This model uses a combination of GIS and machine learning in the R statistical program to identify parameters that correlate with site presence in the Walker Basin and then predict where sites are expected to occur. Our results are especially useful for survey above the historical Walker Lake level and below the waterline. Site presence and distribution are poorly understood above the historical lake level. Below the waterline, predicting where sites are likely preserved on submerged and buried landforms will prove transformative.

Puckett, Neil [213] see Thomas, Sunshine

**Puente, Nicholas (University of Colorado Boulder), Sarah Kurnick (University of Colorado Boulder) and David Rogoff (University of Pennsylvania)**

[96]

*The Vibrant Road: An Analysis of a Sacbe at Punta Laguna, Mexico*

*Sacbeob*, “white roads” in Yucatec, appear throughout the Maya area. These roads vary in length, width, and direction, and archaeologists debate their function. Two common approaches ask whether they were religious routes used during ritual processions or more quotidian causeways that efficiently moved people and goods within and between sites? This analysis utilizes an assemblage theory perspective to delve past this dichotomy and instead begins from a heterarchical understanding of *sacbeob* as vibrant assemblages in the Maya political landscape. Assemblage theory encourages archaeologists to view *sacbeob* as more than mere products of social relationships, highlighting their ability to actualize or prevent new relationships. How did *sacbeob* assemblages interact with other assemblages in the Maya world? This poster introduces a recently discovered *sacbe* at the archaeological site of Punta Laguna in Yucatán, Mexico. Three broad questions are raised. What was the likely function of the *sacbe*? How, if at all, did its use change over time? And, how does it relate the built environment at Punta Laguna? This analysis provides an opportunity to consider both the role of a *sacbe* within the context of Punta Laguna and a source of comparison to *sacbeob* across the Maya area.

**Pugh, Timothy (Queens College and the Graduate Center)****[130]***Inequality in Cities: Hyper-Primacy at Nixtun-Ch'ich', Petén, Guatemala*

Primate centers are capitals that are much larger, relative to secondary centers, than one would expect if everything were equal. In addition to size, such centers dominate economic activities as well as the flow of information. This paper considers hyper-primacy (extreme primacy) in relation to public goods at Middle Preclassic period (1000–300 BC) Nixtun-Ch'ich' in Petén, Guatemala. The site has gridded roads that also functioned as a drainage system as well as artificial pools of water and monumental architecture. In addition to being public works, these constructions acted as symbolic public goods that would have added to the religious importance/centralization of the city. Public goods draw creative people into modern cities and a similar pattern might have occurred in the Middle Preclassic period. The paper then considers the social implications of the concentration of material resources, creativity, and sanctity relative to nearby towns. In particular, it considers the emergence of inequality in a polity that otherwise seems to have had a more cooperative political system.

**Pugliese, Francisco (Museu de Arqueologia e Etnologia, Universidade de São Paulo) and Eduardo Neves (Museu de Arqueologia e Etnologia, Universidade de São Paulo)****[63]***Isotopic Proxies for the Long-Term History of the Monte Castelo Shell Mound, Brazil*

Monte Castelo, a fluvial shell mound located at the Guaporé River wetlands, southwestern Amazon, has proven to be a key site for the archaeology of the Indigenous people of the South American Lowlands. The chronology extends from 6000 BP and the site bears one of the earliest and longest records of clay technology in the New World. From the data obtained by the excavation of the burials, isotopic analysis revealed signals of funerary and associated assemblages from the Middle to Upper Holocene occupation, allowing the initial recognition of human mobility patterns and their relationship with regional paleoenvironments. This presentation is based on the results obtained from isotopic analysis of biological materials from Monte Castelo, comparing them with data from other Middle Holocene sites and landscapes. In ongoing archaeological studies on human mobility in the past, the data is providing a preliminary isoscape of the diachronic bioavailability of light (C, N, and O) and heavy (Sr) elements in southwestern Amazon and beyond. As a fundamental objective, at the end of this research the archaeological mapping from isotopic proxies of human mobility in the ancient Indigenous territories will be open for free consulting to legal uses and scientific updating.

**Punzo Díaz, José Luis (Instituto Nacional de Antropología e Historia) and Fernanda Navarro Sandoval (INAH-Michoacán)****[174]***Lidar Scanning of the Ancient City of Tzintzuntzan: First Results*

The ancient city of Tzintzuntzan was the epicenter of the Tarascan Empire, which covered more than 70,000 km<sup>2</sup>. From this place, the most important political, ritual, and economic decisions were made. This vibrant city, where thousands of people lived after the fall of the empire and the Spanish conquest, began an important decline that culminated with the abandonment of most of it during the sixteenth century. Although archaeological studies in this city have been practically continuous over the last 100 years, they have been concentrated in the monumental areas, leaving aside the study of the extensive residential areas. Furthermore, there has not been a complete plan of the entire city where the architectural complexity and infrastructure of the city is addressed. Thus, to understand the urbanism of this fabulous city, we will present the first results of a lidar scanning project.

**Punzo Díaz, José Luis (Instituto Nacional de Antropología e Historia)****[86]***Discussant***[174]***Chair*

Punzo Díaz, José Luis [174] see Castañón-Suárez, Mijaely  
 Punzo Díaz, José Luis [174] see Ibarra López, Miguel  
 Punzo Díaz, José Luis [174] see Navarro Sandoval, Fernanda  
 Punzo Díaz, José Luis [14] see Schwartz, Christopher

**Purcell, Gabrielle (University of North Carolina at Chapel Hill)****[203]***Sustaining a Nation: Changes to Cherokee Foodways during Colonization*

Most studies on Indigenous foodways during European colonization focus on cultural shifts (including changes in foodways) and power dynamics caused by a demand for European goods. However, in the interior southeastern United States, some of the foods brought by colonists were traded inland through Native trade networks before the arrival of European traders. This allowed interior groups to direct their own cultural transformations through daily practice as they ate these new foods and used them to create dishes that became a part of their identity. I use archaeological plant food remains to examine quotidian food practices in Cherokee households, and the ways Cherokees changed their society from within. Results show that Cherokee foodways were persistent during colonization, but not unchanging, as Cherokee decision-making shaped their choices and use of select European-introduced foods in their cuisine. By the late eighteenth century, Cherokees adopted a new staple crop, sweet potatoes, as they continued to feed and sustain the Cherokee Nation in the rapidly changing colonial landscape.

**Pyburn, K Anne (Indiana University) and Richard Wilk (Indiana University)****[188]***A Change in the Landscape of Research*

The end of the twentieth century saw a gradual turn among the archaeologists studying Mesoamerica from an exclusive focus on the most glamorous remnants of the past to a greater emphasis on the lives of ordinary people. From this change arose studies of gender, landscape, households, and agriculture that considered human agency and refocused attempts to understand the development of ancient states away from the claims of kings. Ultimately, archaeologists have stopped looking for their own reflection in the past and began to recognize the diversity of world heritage. Wendy Ashmore was at the forefront of this quiet revolution that moved archaeology from the search for ancient things to the science of finding things out.

Pyburn, K Anne [159] see Sievert, April

Qiu, Yijia [54] see Walden, John

Quade, Jay [16] see Abell, Jordan

**Quade, Leslie (Masaryk University)****[17]***Growth, Health and Adolescence in Roman and Late Antique Gaul*

It is well-established in clinical and bioarchaeological literature that health is impacted by adverse cultural and political environments, particularly during childhood and adolescence. Although the transformation occurring during Late Antiquity (300–700 CE) in Gaul remains poorly understood, relatively few studies have examined health during development to address current debates. In this study, height-for-age Z-scores generated from femoral lengths and nonspecific stress indicators (dental enamel hypoplasia, cribra orbitalia, and tibial periosteal reactions) were analyzed in 844 individuals from multiple sites in Gaul dating from the Roman (first–third centuries CE) and Late Antique (fourth–seventh centuries CE) periods. Results indicate that growth was more negatively affected during the Gallo-Roman period, where adolescents from Roman Gaul displayed some of the most pronounced degrees of growth stunting and higher proportions of several nonspecific stress indicators. This suggests that height and health were more negatively affected by social and cultural factors rooted in Roman lifeways than by the process of transformation. Gallo-Roman individuals living in urban environments may have been more regularly exposed to infectious pathogens throughout childhood and adolescence, inhibiting opportunities for catch-up growth and resulting in high rates of dental enamel defects and shorter femoral lengths.

**Quilter, Jeffrey (Peabody Museum, Harvard University)****[192]***Ancient Nose Ornaments*

Throughout his long career, Richard Burger's interests have ranged wide and long, from large questions to small details about the past. This paper honors him by summarizing my recent research on ancient nose ornaments (*narigueras*). Their worldwide and temporal distributions are briefly noted followed by a focus on the Central Andes. Their temporal and spatial distributions there, as well as stylistic differences and changes, tell us much about ethnic and social identities and political dynamics.

**Quinn, Colin (Hamilton College) and Molly Symmonds (Hamilton College)****[71]***FTIR Analysis and Experimental Examination of Variability in Middle Bronze Age Transylvania Cremations*

The Bronze Age was a time of large-scale transformative change in the social, political, economic, and ideological systems of European societies, leading to the permanent institutionalization of social inequality. Understanding variability in mortuary practices, therefore, is an important line of evidence for understanding how the process of institutionalizing inequality occurred. In Middle Bronze Age (2000–1500 BCE) Transylvania, cremation and burial within urns in cemeteries was the most common way in which people transformed and buried bodies. In this study, we use Fourier-transform infrared spectroscopy (FTIR) to document variability in the Middle Bronze Age cremation cemetery at Sebeș, Romania. Previous research has suggested that FTIR analysis can determine whether bones had flesh on them when they were burnt. To test this assertion, we conducted experimental cremations in a controlled environment. Using pig bones and varying the temperature, duration of cremation, and presence/absence of flesh, we replicated cremation practices and analyzed these specimens using FTIR. Our results suggest that FTIR spectra are the result of a complex interplay of variables within the cremation environment. These experimental results help identify patterned variation in the Sebeș cemetery and address whether there were multiple ways Transylvanian communities cremated their dead during the Bronze Age.

**Quinn, Colin (Hamilton College)****[71]***Chair*

Quinn, Colin [71] see Arnold, Elizabeth

Quinn, Colin [83] see Goodale, Nathan

Quinn, Colin [71] see Leahey, Aidan

Quinn, Colin [71] see Subramaniam, Nandini

Quinn, Colin [71] see Waterman, Anna

Quintana, Patricia [209] see Hernandez-Bolio, Gloria

**Quintana Morales, Eréndira (University of California, Santa Cruz), Oliver Craig (University of York), Mary Prendergast (Rice University), Sarah Walshaw (Simon Fraser University) and Christina Cartaciano (University of Michigan)**

[186]

*Diet, Economy, and Culinary Practices at the Height of Precolonial Swahili Urbanism*

Swahili cuisine is known across Africa and globally as a highly distinctive product of a cosmopolitan, coastal, urban society. Here we present a comprehensive study of precolonial Swahili diet and culinary practices at the coastal town of Songo Mnara, positioning archaeological and ethnographic understandings of cuisine in a long-term coastal tradition. We explore contemporary food cultures and then present the first direct evidence for precolonial cuisine by combining ceramic lipid residue analysis with archaeobotanical, zooarchaeological, and faunal and human stable isotopic data. Integrating these datasets produces a detailed picture of diet at the site of Songo Mnara during the peak of precolonial Swahili urbanism. Lipid residue analysis demonstrates how plant and animal products were consumed and valued in ways not discernible from plant and animal remains alone. We also note special treatment for particular foodstuffs, including an association of fish consumption with high-status spaces and vessels, and preferential management of cattle for milk. A more complex picture of urban life emerges, recognizing influences of taste, class, and culture. Our findings demonstrate the potential of multi-layered anthropological studies for exploring cuisine and urban life in coastal contexts across the globe.

**Quispe-Bustamante, Hubert (Proyecto Ak'awillay, Proyecto Kaninkunka)**

[189]

*Elites Wari y Elites Cusqueñas: Comportamientos Funerarios durante el periodo Horizonte Medio*

Las investigaciones en los Andes no distinguen sociedades locales con elementos foráneos Wari intrusivos de los contextos Wari estatales, propiamente dichos, dado que existen erróneas interpretaciones de vincular todos los sitios con metales o cerámica Wari como parte del estado ayacuchano. En esta presentación, hago un análisis comparativo de los contextos funerarios del Cusco fechados al Horizonte Medio desde una perspectiva de abajo hacia arriba. La organización política poderosa Wari en la sierra sur fue versátil y tuvo distintos tipos de impactos: un impacto real de control, interacción y dominación en las colonias absorbidas por Wari en Huaró, Muyu Roqo y Espiritupampa; otro segundo impacto se dio en menor medida en áreas de influencia sin un control directo sobre algunos desarrollos regionales del Cusco como Minas pata, Kullupata, y Curahuasi; y por último no tuvo impacto en otras elites regionales en el Cusco como Ak'awillay, Choquepunkio, Urinqosqo, Chumpiwilkas, Kanas y Wimpillay. Eso sugiere que el nivel de control Wari y su impacto sobre las comunidades locales fueron variados a través del espacio durante el Horizonte Medio.

**Raab, Bailey (Archaeological Research Institute), Adrienne Frie (University of Wisconsin–Oshkosh), Sara Polk (Archaeological Research Institute) and Marcus Schulenburg (Archaeological Research Institute)**

[69]

*Unearthing Menstruation: Locating and Assessing Potential Menstrual Structures in a Fort Ancient Context*

The experience of menstruation is shared by many women at some point in their lives. Despite this near universality the topic has not been extensively investigated outside of hand identification of purported menstrual huts. This trend is especially apparent in the Ohio Valley where the tradition is upheld by a single structure with small posts. By examining accounts of menstrual structures and their presence in the archaeological record across the world, we can develop a plan to identify these structures locally using a combination of ethnography, historical accounts, and archaeology. Finally, we apply our methods to an early Fort Ancient village site, Guard (12D29), in southeastern Indiana. Guard was selected due to its size, the presence of permanent architectural structures, and its extensive excavation history. This method of detecting menstrual structures within sites could be used at Precontact sites in the Midwest to further our overall understanding of menstruation and women within archaeology.

**Rabinowitz, Adam (University of Texas at Austin), Daniel Breecker (University of Texas at Austin), Melissa Kemp (University of Texas at Austin), Sheryl Luzzadder-Beach (University of Texas at Austin) and Angelina Locker (George Mason University)**

[179]

*Grand Challenges in Archaeology, Archaeology in Grand Challenges: The Stories of Ancient Resilience Project and Integrating the Past in the Planet Texas 2050 Grand Challenge at the University of Texas at Austin*

We examine archaeology's role in university-led "Grand Challenge" initiatives focused on problems confronting human societies in the present and future. Through the case-study of the "Stories of Ancient Resilience" (SOAR) project within the Planet Texas 2050 Grand Challenge program at the University of Texas, we discuss concrete ways in which archaeology can contribute to policy-oriented transdisciplinary research. Nearly a decade ago, a group of archaeologists administered a discipline-wide survey to elicit archaeology's "Grand Challenges." This reflected an increasing academic and governmental interest in "Grand Challenge" programs applying science and technology to social and environmental problems. Archaeological research is not a common component of such programs, despite the overlapping concerns of the Grand Challenges identified by the survey and many recent university-led initiatives. Smith (2021) argues that archaeology, to be relevant to contemporary grand challenges, must emphasize quantitative research in collaboration with the natural and social scientists at the center of such projects. The SOAR project adopts this approach, integrating geography (lidar surveys, geomorphology), biological sciences (ancient DNA, paleobiology), and geology (paleoenvironmental reconstruction, isotope-based provenance) with archaeology. At the same time, we argue, storytelling and engagement with community partners remain critical for establishing the relevance of the past to the present.

Radde, Hugh [122] see McClure, Sarah

**Rademaker, Kurt (Michigan State University), Gordon Bromley (National University of Ireland, Galway) and Daniel Sandweiss (University of Maine)****[129]***Updated Peru Archaeological Radiocarbon Database, 13,000–7000 <sup>14</sup>C BP*

In 2011 Lucas Bueno and others convened a SAA symposium to construct radiocarbon databases from 13,000–7000 <sup>14</sup>C for South America, published in a special issue of *Quaternary International* in 2013. The past decade has seen new field research and radiocarbon dates contributed to the record, two updates to the southern hemisphere calibration curve, and a wealth of research papers drawing from South American <sup>14</sup>C databases to explore region- and continent-scale patterns of human-environment interaction, settlement dynamics, and paleodemography. Here, we provide an update to the Peruvian archaeological radiocarbon database for the Terminal Pleistocene to early Middle Holocene. We discuss taphonomic and research biases affecting the record and relationships between millennial-scale climate change and archaeological radiocarbon data. We also highlight the promise and limitations of the current record for Bayesian models. Finally, with goal of outlining some directions for future research, we examine the radiocarbon record using well-established criteria and call attention to unresolved chronological issues in the initial settlement of Peru.

**Rademaker, Kurt (Michigan State University)****[129]***Chair*

Rademaker, Kurt [22] see Gruver, Steph

**Radillo Rolón, Diana (Texas State University, San Marcos) and Carolyn Boyd (Texas State University, San Marcos)****[101]***Comparative Analysis of Pecos River Style and Teotihuacan Felines*

Hunter-gatherer artists in the Lower Pecos Canyonlands of southwest Texas and northern Mexico produced complex, polychromatic murals. Radiocarbon ages for these Pecos River style (PRS) paintings range from 1400 to 3500 years BP. Felines are a dominant zoomorphic figure in the murals. Our analysis of 19 feline figures across 11 sites revealed distinctive, recurring physical attributes. These include lines and dots emanating from mouths and noses, a motif previously interpreted as breath or speech. Other physical attributes include short lines running along the feline's body, long lines extending from the nape and underside of the neck, and lines protruding from behind the top of the feline's front legs. In Mesoamerica, artists used similar graphic devices to denote action, sounds, scents, and energies in motion linked to spiritual substances and ritual calendar events. In this paper, we present a comparative analysis of PRS felines and those portrayed in pictorial narratives dating to the Teotihuacan Classic period (AD 300–900), including the Tetitla, and Atetelco murals, and those on display in the mythological animals' mural. We propose that these PRS and Teotihuacan graphic devices represent sensory signs and are part of the *núcleo duro* (hard core) of Mesoamerican religious traditions.

Radillo Rolón, Diana [101] see Boyd, Carolyn

**Radio-Dzur, Alanna (Getty Research Institute)****[55]***Naming Names: Aspects of Portraiture in the Depiction of the Cihuateteoh of Postclassic Central Mexico*

Within Postclassic central Mexico, conventionalized representations of human actors are the norm. Using particular insignia associated with a title, rank or occupation to define broad categories, an individual's likeness is often only discernable because of the explicit inclusion of a name. While supernatural entities are not always explicitly named, stone sculptures of women identified as the *cihuateteoh*—mortal women deified because of their deaths in childbirth—are invariably inscribed with their calendrical names, providing them with an ambivalent element of individuality. However, these names appear discretely rendered on the back of their heads and therefore out of direct view. Likewise, these titles reiterate the associated periods of time when the *cihuateteoh* descend to wreak havoc on mortal lives rather than to identify the particular women who joined their ranks in death. Can these images of the *cihuateteoh* be said to occupy a liminal space integrating individual portraiture with iconicity?

Rae, Brianna [109] see Sportman, Sarah

**Raff, Jennifer (University of Kansas)****[184]***Discussant***Rafferty, Sean (University at Albany, SUNY)****[89]***The Epistemology of Intoxicant Research*

The study of prehistoric intoxicants benefits from the inclusion of a wide range of data. The reliance on any one category of data is problematic due to a range of biases and limitations. Using examples from eastern North America, I argue using a wide range of data yields the most plausible and complete interpretations. Categories of data include material culture, botanical evidence, chemical evidence, historic sources, iconography, and Indigenous knowledge. The epistemological advantages and disadvantages of each are discussed. Since no single researcher is likely to have expertise in all the relevant categories of analysis, a collaborative approach is advised.

**Rafferty, Sean (University at Albany, SUNY)****[18]***Discussant***Raffield, Ben (Uppsala University)****[25]***Conflict and Colonization in a Predatory Landscape: A View from Viking Age England*

The Viking Age was a formative period of upheaval and change in England. From the end of the eighth century, seaborne raiding groups engaged in intermittent hit-and-run raiding with the aim of securing plunder and captives. The arrival of a large Viking fleet (described in historical sources as a “Great Army”) in East Anglia in 865, however, marked a significant change in the nature of warfare. The next 13 years would bear witness to a period of almost constant conflict, as the Great Army conquered regional kingdoms and established landholdings that would form the basis for future settlements moving into the tenth century. Within this milieu of conquest, colonization, and endemic warfare, local populations sought both to escape the predations of raiding groups while also reaching an accommodation with their new neighbors and overlords. In this presentation, I will explore the archaeological evidence attesting to these processes as they played out within a landscape that was continually being shaped by violence.

**Raffield, Ben (Uppsala University)****[82]***Discussant*

Rahemtulla, Farid [155] see MacDonald, Brandi

**Railey, Jim (SWCA, Albuquerque)****[187]***One More Look at the Bow and Arrow and “Expedient” Technologies*

My 2010 *American Antiquity* article argued that the introduction of the bow and arrow, rather than reduced mobility, could explain the so-called “shift” to “expedient” technologies. Since then, my article has been cited fairly frequently, but some citing it apparently misunderstood the argument I presented, which was based primarily on debitage data from a long-term sequence of sites in the Rio Hondo Valley of southern New Mexico. Some misunderstood my argument to be precisely the opposite of what it was, with respect to either debitage size or reduced mobility. Others have expressed to me in private their confusion over how I could argue that debitage got bigger on average after points got smaller with the introduction of the bow. This compels me to present my argument once again and to provide some further clarification as to why the whole notion of a “shift” to “expedient” technologies may be in error, and why the changeover from making dart points to arrow points could have produced lithic assemblage trends observable over much of subboreal North America.

**Rainville, Charles and Steven Karacic (PaleoWest)****[65]***Mapping a Belle Glades Archaeological Complex in the Lake Okeechobee Basin, Florida*

The Lake Okeechobee Basin in Central South Florida was intensively modified by Belle Glades (1000 BCE–1700 CE) communities. The hunter-gatherer-fisher people who inhabited this extensive watershed engaged with complex landscape alterations, including mound construction, earthworks, and pit digging in and around wetland sinks and tree islands. Locations were consistently inhabited, revisited, and modified, informing community memory in successive generations. The Lake Okeechobee Basin lacks the history of robust analysis conducted at similarly dated coastal and northern sites, specifically lidar-derived DEM models and region-specific history. Previous investigations into Belle Glades landscape manipulation have focused on discrete mounds and habitation spaces. In this study, we highlight a series of new and previously known but under-investigated archaeological sites around a seasonally full wetland through DEM, historic imagery, Spanish documents, and modern surveys to illustrate a significant archaeological complex. We discuss the necessity of viewing landscape alteration holistically; sacred spaces are not limited to discrete mounds and earthworks, but also the manipulation of landscape over a vast distance in many forms over deep time. Our analysis identifies the creation of a sacred space through landscape modification and mortuary tradition in and around wetland sinks, tree islands, and low-lying places.

Raja, Mussa [186] see Skosey-LaLonde, Elena

**Ralston, Claire (University of Nevada–Las Vegas) and Debra Martin (University of Nevada–Las Vegas)****[69]***Atypical Burials at Turkey Creek Pueblo, Arizona: Implications for Gender Roles and Experiences of Disease and Trauma at a Mogollon Pueblo Site (AD 1225–1286)*

Mortuary practices are influenced by many intersecting biological, sociocultural, and ideological factors relating to the individual, those who bury them, and broader cultural community. The presented research uses osteological and mortuary data to explore how sex, age, and social status, as bioarchaeologically visible axes of gender identity, intersect to produce gendered bodies and identify which axes of gender identity best explain observed distributions of disease, workloads, and traumatic injury among the prehistoric occupants of Turkey Creek Pueblo, Arizona ( $n = 323$ ), the earliest aggregated pueblo in the Point of Pines region of the Mogollon Culture area (AD 1225–1286). The general mortuary system at Turkey Creek Pueblo is suggestive of a homogenous and egalitarian community where burial treatment is not strictly conditional on the age or sex of the individual. Four burials, represented by a young

adult female with perimortem trauma and three adult males, exhibit an atypical quantity, type, and quality of burial furnishings and offerings. It is suggested that the observed differences in mortuary arrangements between typical and atypical burials are reflective of biological, social, and ideological factors beyond age and sex that are specific to the individual and their complex social positions and gendered roles within the community.

**Ramírez Funes, Horacio (University of Chile), Carolina Belmar (University of Chile), Fernanda Falabella (University of Chile) and Lorena Sanhueza (University of Chile)**

[18]

*The Potentiality of Metabolomics Based Studies on Dental Calculus: A Study Case from Central Chile (Southern Andes)*

In recent years, many investigations have recovered a wide variety of organic materials from human dental calculus. As a result, dental calculus is now considered a good proxy for the study of subsistence, diet, foodways, medical practices, health, and long-distance interactions. We present the results of a metabolomics-based investigation conducted on 41 samples of dental calculus extracted from precolumbian burials located in central Chile (southern Andean region). The combination of multivariate statistics (PCA), demographic and cultural data, showed that the variations in the oral deposits of organic substances are associated with cultural and geographical differences. This variety is probably explained by the disparities in the subsistence strategies between cultural groups, and between the coast and the valley. Additionally, our results indicate a clear relationship between the weight of the samples and the number of strong signals detected. In conclusion, our investigation shows the potentiality of metabolomics-based studies on dental calculus, presenting also methodological information, useful for future research.

**Ramon, Gabriel (Pontificia Universidad Católica del Perú)**

[129]

*Discussant*

**Ramon Celis, Pedro (Indiana University Bloomington)**

[123]

*Reimagining the Homeland: Urban Standardization and Migration in Postclassic Guiengola, Oaxaca*

In this paper, I will present the results from my first two seasons of field survey at the archaeological site of Guiengola, in the southern Isthmus of Tehuantepec, Mexico. Before this project, the extension and limits of the archaeological sites were unknown. Still, most importantly, there was a lack of evidence regarding details on the daily life of the people who built and lived in this place. The results of these two years of fieldwork have shown the existence of one of the most well-preserved Mesoamerican cities. In that regard, it has been possible to register and record two sectors of the city. The similarities and differences between them have made it possible to rethink existing notions concerning the process in which the Zapotec population migrated and settled in a new environment, significantly different from their homeland in the Central Valleys of Oaxaca.

**Ramon Celis, Pedro (Indiana University Bloomington)**

[123]

*Chair*

Ramos, Frank [157] see Kellner, Corina

Ramos Madrigal, Jazmin [19] see Schroeder, Hannes

**Randall, Asa (University of Oklahoma)**

[216]

*"The past is never dead; it's not even past": The Archaic Southeast in a Post-Archaic World*

Stadial thinking embedded in archaeological periodization promotes the rupture of lived experience from landscapes of past practice. Whereas an earlier generation of scholarship viewed the Archaic period as the precondition for structural developments in a post-Archaic world, recent work across southeastern North America demonstrates that Archaic forebears provided objects, places, and landscapes rife with the potential for reflection and politicization. Evidence for ancient archaeologies in the form of object gathering, pit digging, citations, and reproductions highlight the ways in which continued engagement with Archaic materials and places were generative of new experiences and traditions.

**Ranere, Anthony (Temple University) and Ruth Dickau**

[151]

*The Role of Phytoliths and Starch Grains in Rewriting the History of Early Plant Domestication in the American Tropics*

[WITHDRAWN]

**Rankin, Caitlin (Illinois State Archaeological Survey), Michael Brent Lansdell (Illinois State Archaeological Survey) and John Klein (Illinois State Archaeological Survey)**  
**[119]**

*Alluvial Fan Geoarchaeology of the Dupo Interchange Project, Illinois*

The term "alluvial fan" in Midwest archaeology tends to render expectations of well-stratified archaeological sites that are neatly buried under a mass of alluvium. At least, this was the Illinois State Archaeological Survey staff's expectations for the much-anticipated IDOT I-270 Interchange Project near Dupo, Illinois. We expected the project to yield a neatly stratified, multi-phase sequence of Woodland sites buried within the Cement Hollow alluvial fan. However, what we uncovered was a stratigraphically discontinuous landform, with multiple fan lobe extensions that removed and redeposited older archaeological sites. In this presentation, we share how we use geoarchaeological methods of stratigraphic analysis to unravel the complex context of archaeological sites in the Cement Hollow alluvial fan and provide insights and perspective on the diversity of fans for other researchers working in these complex and diverse landforms.

Rankin, Caitlin [15] see Aiuvalasit, Michael

**Rankin, Jennifer (Minnesota Historical Society)**

**[127]**

*Protecting Minnesota's Archaeological Heritage through Community*

Over the last decade, archaeologists from the Minnesota Historical Society and Minnesota Department of Natural Resources have executed a monitoring program to protect archaeological resources on public lands that have the potential to be impacted and/or destroyed by severe weather events, wildfires, and lake/riverine shoreline erosion. Similar to patterns seen across the United States, an increasing trend has been identified across Minnesota and it is predicted that the impacts of these weather events will increase in their frequency and severity in the coming decades, resulting in compromised integrity or destruction of our archaeological resources. Such threats can be devastating to the past in which community's value and rely on or wish to preserve and bring into the future. To set future research, education, and preservation priorities, our focus has been to understand the vulnerability of archaeological resources to climate change impacts and their importance to those priorities. Our goal continues to study, document, partner, and mitigate immediate and long-term climate threats to the archaeological resources in Minnesota. This includes engaging, educating, and supporting Minnesota communities in monitoring archaeological resources at risk and developing local partnerships and programs across Minnesota for future archaeological site and resource management.

**Ranlett, Sarah (University of Toronto)**

**[117]**

*Experiential Approaches to the Cultural Perception of Unusual Raw Materials in the French Upper Paleolithic*

The visual nature of Archaeology as a discipline has resulted in approaches to the archaeological record that tend to focus on static visual attributes such as morphological types, subject matter, and artifact decoration over other sensory experiences like tactile luster, smell, relationships between sites and limited geological sources within a landscape as well as dynamic visual qualities like translucence and iridescence. During the Upper Paleolithic, use of materials with distinctive material and sensory qualities such as these (e.g., amber, lignite, soapstone, quartz crystals, etc.) increased along with, and usually within the framework of, the intensification of symbolic behavior by mobile, hunter-gatherer groups. By approaching artifacts rendered in these materials from an experiential perspective, this work identifies previously underexplored material qualities that may have been perceived as culturally meaningful by Upper Paleolithic people.

Ranum, Caleb [20] see McKenzie, Emily

Rasbury, Troy [158] see Iorga, Anastasia

Rascovan, Nicolás [157] see Barberena, Ramiro

**Rasic, Jeffrey (National Park Service)**

**[83]**

*Regional Characterization of Lithic Landscapes: A Framework for Interpreting Technology, Social Interaction, and Quarry Use*

Archaeologists often ponder the ways flaked stone tool technology is conditioned by the nature of lithic raw material attributes such as quality, size, shape, and abundance. The implications are typically considered at the scale of artifacts, toolkits, and site assemblages. This paper explores ways lithic raw material source attributes taken in aggregate across a region may also influence the archaeological record in broader and more fundamental ways. It is hypothesized that a region's lithic raw material landscape can channel technological and economic choices over time to shape the fundamental character of regional scale archaeological records in predictable ways. Examples of obsidian and chert use from regions of Alaska are used to develop schemas useful for characterizing raw material landscapes and regional archaeological records and elucidating relationships between them. A useful concept emerging from this analysis is that regions can be placed on a lithic raw material source-sink continuum, which provides important contexts for understanding interaction networks, and ranking the utility of toolstone sources within regions.

**Rautman, Alison (Michigan State University)**

[37]

*Moderator***Ray, Erin (University of New Mexico), Nadia Neff (University of New Mexico), Douglas Kennett (University of California, Santa Barbara) and Keith Prufer (University of New Mexico)**

[47]

*Diet and Resilience in Southern Belize during the 4.2 kyrp Aridification Event*

Recent paleoclimate studies from Central and South America suggest a period of decreased rainfall between 5000 and 4000 cal BP that coincides with increasing reliance on maize agriculture. Two rockshelter sites located in Southern Belize produced a mortuary assemblage that spans the last ~9,000 years. These assemblages provide a unique opportunity to examine how the transition to agriculture may have been affected by dry Middle Holocene conditions. We compare paleoclimate reconstructions at regional and continental scales to evaluate the timing and severity of the drying during this interval. We present analyses of stable isotopes of carbon, oxygen, and nitrogen from directly dated human bone across this interval. These reflect diet sources, life history changes, and shifts in baseline ecological conditions that may be related to climate change. We document that between 4700 and 4200 BP lowland populations were already investing in maize horticulture and farming which lead to population growth and the emergence of farming villages. In this context, we hypothesize that a drying trend may have only slightly prolonged the transition to agriculture relative to neighboring regions.

Ray, Jacob [117] see Smallwood, Ashley

Rayburn, Cassidy [136] see Colaninno, Carol

**Rayburn, Kathryn (Mississippi State University), Emily Beahm (Arkansas Archeological Survey), Carol Colaninno (Southern Illinois University, Edwardsville), Carl Drexler (Arkansas Archeological Survey) and Shawn Lambert (Mississippi State University)**

[159]

*A Student's View of Sexual Harassment and Conflict at Field Schools*

Field school is a general requirement for most undergraduate students in archaeology programs, and making fieldwork safe and inclusive for students is a key step toward diversifying archaeology as a discipline. Research shows that there is a high potential for archaeologists to experience unwelcome behavior and harassment during fieldwork, particularly for young students, new professionals, women, minorities, and members of the LGBTQ community. We conducted several interviews of students participating in field schools in the United States to understand students' perception of safety and inclusion at archaeological field schools. This research seeks to understand students' experiences in the field, and preliminary results highlight students have similar experiences and perceptions surrounding sexual harassment training, development of inclusive culture, and power dynamics in field schools. Students expressed that field school sexual harassment training did not necessarily prepare them to identify instances of sexual harassment and assault, reportable offenses, and understand the intricacies of Title IX reporting, investigatory procedures, and available supports through an investigation. Understanding, valuing, and documenting the perspectives and experiences of students before, during, and after archaeology field schools is important to develop a safer and more inclusive field environment.

Rayburn, Logan [39] see Russ, Jon

**Razo, Mikaela (Center for Archaeological Research, University of Texas-San Antonio), Marissa Muñoz (University of Texas-San Antonio) and Alexa Proffitt (University of Texas-San Antonio)**

[136]

*Archaeology Education: Building a Curriculum with Archaeological Content and Education Methodologies*

Based out of the Center for Archaeological Research at the University of Texas at San Antonio, "Legacy: Hands on the Past" is an archaeological outreach program that engages K–12 students and the broader public in exploring the rich historical record, diverse local heritage, and historic preservation of San Antonio. Over the past three decades, Legacy has worked to promote the public's understanding of archaeology and its methodologies, ethics, and significance through workshops, tours, summer camps, and educational resources. Legacy's program coordinators have always been trained first as archaeologists, creating a program curriculum robust in content but lacking in educational practices. The yearlong pause in Legacy programming due to the COVID-19 pandemic allowed us to partner with scholars from UTSA's Education Department and scrutinize Legacy's current pedagogy to develop a program using archaeological content but structured by educational models. We highlight and discuss the challenges and successes of collaborating across disciplines, discuss new endeavors to broaden the Legacy's programs to reach new audiences, and provide updated educational resources to the teaching community.

**Reamer, Justin (University of Pennsylvania)**

[109]

*Non-maize Cultigens in the Upper Delaware Valley: Results of Paleoethnobotanical Analysis from Manna (36Pi4)*

Mid-Atlantic and northeastern North America, east of the Appalachian Mountains, has been described as an "archaeological backwater." The Algonquian people of the region have been viewed as largely disconnected from the rest of the Eastern Woodlands. One area where this separation is particularly stark is the lack of evidence for the cultivation of domesticated Eastern

Agricultural Complex crops. While widespread across midwestern and southeastern North America, aside from two sites in Susquehanna River drainage there has been limited evidence for the cultivation of these crops east of the Appalachian Mountains. In this paper, I present the results of paleoethnobotanical analysis from the Manna site (36Pi4). Manna, situated on the first terrace of the Upper Delaware River, is a deeply stratified section of the large Minisink Archaeological District, with Lenape occupation dating to at least the Transitional Archaic (circa 4000–3000 BP). Results from paleoethnobotanical analysis indicate that the Lenape were cultivating or using a number of the Eastern Agricultural Complex crops by the Middle Woodland period. I will discuss the results of my analysis and how the paleoethnobotanical record from Manna can help to connect mid-Atlantic and northeastern North America to the rest of the Eastern Woodlands.

**Reamer, Justin (University of Pennsylvania)**

[109]

Chair

Reátegui Díaz, Alexis [214] see Plekhov, Daniel

Recio, Diana [221] see Meinecke, Helena

**Reed, Paul (Archaeology Southwest) and Theresa Pasqual**

[152]

*The Pueblo of Acoma's Connections to Salmon, Aztec, and the Middle San Juan Region*

Archaeological and historic research into the Middle San Juan region and its large Chacoan great house sites at Salmon, Aztec, and other places has proceeded for more than 100 years without any involvement of descendant Pueblo communities. This lack of collaboration has impacted Pueblo communities in the Southwest and greatly diminished understanding of these amazing places. Working with Pueblo of Acoma community members, Archaeology Southwest is working to redress these grave shortcomings. This collaborative work is helping Acoma reconnect to ancestral landscapes and expanding knowledge in the archaeological world. It is also giving us pause to think about how we apply sensitive information in land management decisions. In this paper, we discuss these issues.

**Reed, Sara (Barnard College)**

[173]

*Think Like a Watershed: One Mountain's Tale of Water Politics and Heritage in Northern New Mexico*

Jicarita Peak, a looming shoulder of the Sangre de Cristo Mountains in northern New Mexico, is a convergence of disparate peoples, cosmologies, and politics. The mountain is a crucial part of a vast watershed that extends from its 12,000' slopes down to the Rio Grande and is home to Picuris Pueblo, North America's oldest continually inhabited settlement. Over the past three centuries, the watershed has become home and life source to a range of communities, both Indigenous and settler-colonial, introducing questions of heritage, belonging, and acknowledgment of ancestral and contemporary presences. This project considers the role archaeological heritage plays in current and future struggles around water sharing and the urgency to document a cultural landscape that will be irrevocably changed as global temperatures rise and access to water becomes ever more critical.

**Reeder-Myers, Leslie (Temple University), Wilmer Elvir (Universidad Nacional Autónoma de Honduras), Whitney Goodwin (University of Missouri), Máximo Jiménez (Smithsonian Tropical Research Institute) and Ashley Sharpe (Smithsonian Tropical Research Institute)**

[154]

*Mangroves and Middens: Exploring the Role of Guaimoreto Lagoon in Resilient Strategies at the Selin Farm Site, Northeast Honduras*

Recent research at Guaimoreto Lagoon demonstrates the complex role that the mangrove lagoon played in subsistence, ritual, and identity for the people who lived nearby. The Selin Farm site sits adjacent to the lagoon and comprises around 30 well-stratified house and shell mounds, occupied from AD 300 to 1000. Analysis of material from Mound I, a 4.5 m high shell mound with excellent faunal preservation, provides a full view of how the lagoon changed alongside shifting economic and political practices at the site. While experimenting with new agricultural practices and greater sociopolitical complexity, people exploited a wide range of fish, shellfish, mammals, birds, reptiles, and amphibians. An exceptionally high diet breadth and a flexible subsistence system based heavily on the species-rich mangrove lagoon helped the inhabitants of Selin Farm navigate the upheaval of economic, social, and political systems that occurred during the eighth–ninth centuries AD. The resource rich lagoon also provided ample food for feasting and helped support the emergent political elite at the site, while imagery on locally produced ceramics shows that lagoon animals, especially manatees, were uniquely important to the people of Guaimoreto Lagoon.

Reeder-Myers, Leslie [82] see Goodwin, Whitney

Rees, Mark [127] see Watt, David

**Reese, Kelsey (University of Notre Dame)****[152]***A Chaco Great House Outlier Community on the Mesa Verde North Escarpment*

Recent survey efforts on the Mesa Verde North Escarpment ("Escarpment") in southwestern Colorado have identified a previously unrecorded Chaco-era Great House outlier and surrounding community continuously occupied from AD 890–1300. While early occupation of the area was small and dispersed, the Line-of-Sites Community became the most densely occupied space on the Escarpment during the late Pueblo II period as households aggregated around Line-of-Sites Great House and constructed common goods in the spatial center of the community. This paper will give an overview of the development, organization, and florescence of this community into and throughout the Chaco era, and explore the potential social, political, and economic connections to contemporaneous great houses in the central Mesa Verde region.

Reese, Kelsey [127] see Steffen, Anastasia

**Reese-Taylor, Kathryn, Felix Kupprat (Universidad Nacional Autónoma de México), Nicholas Dunning (University of Cincinnati), Armando Anaya Hernández (Universidad Autónoma de Campeche) and Debra Walker (University of Florida)****[48]***Kanu'l Regime, Expansion, and Transformations in the Sixth through Eighth Centuries*

The mid-sixth through the mid-eighth centuries were a pivotal period in Maya culture, immediately following the climatic crisis of 536 CE. Geopolitics of this period were dominated by the powerful Kanu'l dynasty, first from their seat at Dzibanche and, after 635 CE, from their new capital at Calakmul. This move not only transformed the geopolitical landscape of the Maya lowlands but also had an immediate impact throughout the Central Karstic Uplands, a region likely under the direct control of the Kanu'l rulers. Within this paper, we examine the strategies deployed by the Kanu'l regime to establish and maintain hegemonic control over a vast geopolitical landscape, as well as to administer their local territory as it underwent an urban explosion.

**Reese-Taylor, Kathryn****[11]***Discussant***Reetz, Elizabeth (University of Iowa Office of the State Archaeologist)****[190]***An Overview and Assessment of Virtual Object-based Archaeology Programming for Older Adults in Senior Living Communities*

In September 2020, the University of Iowa Office of the State Archaeologist (OSA) was awarded grant funding from the Institute of Museum and Library Services under the Coronavirus Aid, Relieve, and Economic Security (CARES) Act in partnership with other collections units on campus to develop the project, Connected for Life: Object-based Digital Programming to Foster Active Minds for Senior Living Communities (CFL). CFL caters to older adults across Iowa, with this age group being one of the most isolated communities due to the pandemic. Now in its second year, CFL offers synchronous, virtual outreach programs that focus heavily on objects curated at the OSA. The grant allowed outreach staff to expand their capacity to create digital public archaeology programs and resources and increase accessibility with new equipment for visual and auditory clarity, captioning services, and accessibility-minded redesigns of shared slides and documents. Pilot programs offered an opportunity to explore alternative set-ups and services, with the primary challenges being the lack of accessibility resources on campus and a lack of quality tele-conference equipment at under-funded senior living communities. OSA also partnered on a research project assessing participants' moods and sense of well-being after attending CFL programs and will present preliminary data.

**Reetz, Elizabeth (University of Iowa Office of the State Archaeologist)****[190]***Chair*

Reeves, Jonathon [90] see Tizazu, Michaela Zewdu

**Regala, Frederico (ICArEHB—Interdisciplinary Center for Archaeology and Human Behavior) and Lino André (ICArEHB)****[98]***Ornament Productions in the Upper Paleolithic of Vale Boi (SW Portugal)*

Vale Boi has a long deposition sequence ranging from the early Gravettian to the Neolithic times. The Upper Paleolithic ornaments associated with shell beads includes over 100 specimens from the Gravettian, Proto-Solutrean, Solutrean, and Magdalenian layers from Vale Boi, including at least five species: *Littorina obtusata* or *Littorina fabalis*, *Trivia* sp., *Antalis* sp., *Mitrella scripta*, and unperforated *Theodoxus fluviatilis*. A single red deer (*Cervus elaphus*) perforated canine tooth was also found in a Gravettian layer. A number of experimental perforation techniques were conducted, using lithic and bone implements on equivalent contemporary shells and red deer teeth. Results indicate the use of a single specific technique for each species in the archaeological record. Differences in the frequency and diversity of ornamental items found at Vale Boi are likely best understood in a cultural framework, with no straightforward relation to the raw-material availability in the region, nor following a chronological pattern of straight evolution.

Regnier, Amanda [65] see Hammerstedt, Scott

**Reichert, Susanne (Bonn University)****[99]***Building a City: A Kiln Site at Khar Khul Khaany Balgas, Mongolia, from the Era of the Mongol Empire*

Although not widely known, Karakorum, the former capital of the Mongol Empire in the Orkhon valley in Mongolia, is not the only large fixed habitation site of that era in Central Mongolia: Khar Khul Khaany Balgas, located in the Khanui valley, provides a comparative case study for Karakorum. In 2017–2019, Bonn University together with the Institute of Archaeology of the Mongolian Academy of Sciences undertook field research to provide new maps and information on hinterland use of the city's surroundings through systematic intensive pedestrian surveys. One result was the detection of a line of kilns nearby the city. The paper presents the excavation results of one perfectly preserved Mantou-style kiln used for the production of ceramic building materials. It takes this feature as a starting point to address the economic implications of building a city. Comparisons with other kilns from the region will elucidate possible precursors and offer an avenue to look into wider networks of communication and critical acquisition of skilled labor. In order to truly understand how imperial rule exerted control over the pastoralist landscapes of Mongolia, we need to look beyond the paramount example of Karakorum. The case study presents one crucial building block in this endeavor.

**Reichert, Susanne (Bonn University)****[99]**

Chair

**Reid, David (University of Illinois at Chicago)****[189]***A Bottom-up Perspective on Middle Horizon Road Waystations and Their Relation to the Wari State in Southern Peru*

The Andean Middle Horizon (600–1000 CE) was a time of profound social change in southern Peru, distinguished in part by the expansion of the Wari Empire. Various investigations have highlighted the role of road infrastructure within Wari's political economy and the increasing regional connectivity of the period. This paper takes a bottom-up approach toward Middle Horizon road networks with a focus on the Majes Drainage of Arequipa, Peru. Here, located along the valley's main prehistoric road, both an intrusive Wari state and local communities established respective road waystations and ceremonial centers, all within a 10 km corridor. Excavations at the waystations Santa Rosa II and La Angostura show a strong dialogue with Wari material culture. However, evidence suggest these sites were established by local peoples and served as places of long-distance exchange, ceremonial gatherings, and ritual oriented toward local place-making. Here I explore the various relationships that locals may have formed with Wari foreigners, such as those who resided at the D-shaped temple complex of Pakaytambo in the upper drainage. Rather than assume an a priori client-state relationship, I investigate how local road waystations may have functioned and highlight the resiliency of indigenous traditions that continued post-Wari abandonment of the region.

Reid, David [129] see Williams, Patrick Ryan

**Reifschneider, Meredith (San Francisco State University)****[205]***The "Last Free Place": Ruination and Sustainable Futures at the Salton Sea*

This paper outlines an archaeological ethnographic project at East Jesus, an intentional community located on the south shore of the Salton Sea in Southern California's Imperial Valley. East Jesus was established in 2007 as a sustainability-focused artist collective. Popular and official discourses about the Salton Sea position it as a postapocalyptic wasteland and ecological ruin but also an untapped resource for energy development. These representations overlook East Jesus's material practices and modes of habitation in this landscape. This project asks, How do residents of East Jesus use the material features of the Salton Sea's "ruined" landscape to forge sustainable ways of living? How do representations of the Sea a ruined landscape undergird East Jesus's status as unregulated and "off-the-grid" community while also authorizing new regimes of extraction? As East Jesus residents contest economic development schemes in the region, they articulate commitments to modes of living in and with a ruined landscape, making them an important case study to complicate notions of the Anthropocene as a space of material and environmental abjection. As such, this project contributes to anthropological debates concerning the changing ecologies of capital and destruction, ways of living in the ruins of modernity, and sustainability and climate change.

**Reifschneider, Meredith (San Francisco State University)****[205]**

Chair

Reilly, Matthew [80] see Stevens, Craig

**Reinhardt, Eduard (McMaster University), Brandi MacDonald (Archaeometry Lab at MURR), James Chatters (Applied Paleoscience), Samuel Meacham (CINDAQ) and Dominique Rissolo (University of California, San Diego)****[221]***Paleoindian Ochre Mines in the Submerged Caves of the Yucatán Peninsula, Quintana Roo, Mexico*

Investigations in the now-submerged cave systems on the Yucatán Peninsula continue to yield evidence for human presence during the Pleistocene–Holocene transition (13,000–8000 BP). Human skeletal remains are scattered throughout the caves of Quintana Roo, and the reasons why Yucatán's earliest human inhabitants explored these underground environments have remained unclear. Here, we present the discovery of the first subterranean red ochre mine of Paleoindian age yet found in the Americas, offering compelling evidence for mining in three cave systems on the eastern Yucatán over a ~2,000-year period between ~12 and 10 ka. The cave passages exhibit remarkably preserved evidence for human activities, including ochre extraction beds and pits,

speleothem digging tools, shattered and piled flowstone debris, cairn navigational markers, and hearths yielding charcoal from highly resinous wood species. The sophistication and extent of the activities demonstrate not only a readiness to engage in hazardous behavior to collect large quantities of what was evidently a highly valued mineral resource, but also necessitated a cooperative social group structure to accomplish. The timing and duration of ochre mining coincides with the onset of major ecological changes, sea-level rise, and megafauna extinction during the Pleistocene–Holocene transition.

Reinhardt, Eduard [221] see Chatters, James  
Reinhardt, Eduard [154] see Steele, Riley

**Renson, Virginie (University of Missouri), Benjamin Barnes (Shawnee Tribe), Evan Peacock (Mississippi State University), David Pollack (Kentucky Archaeological Survey) and Simon Sherman (University of Memphis)**

[30]

*Elemental and Isotopic Geochemistry of Freshwater Shells to Source Shell-Tempered Ceramics*

The aim of this research project is to evaluate the efficacy of elemental and strontium isotope analysis to contribute to our knowledge of shell-tempered ceramic circulation and exchange. It builds on recent pilot studies showing that freshwater mussel shells recovered at archaeological sites located in different drainages present different elemental compositions. Here, a combination of elemental and strontium isotopic analyses is applied to whole freshwater shells and shell temper fragments extracted from shell-tempered ceramics. The method is tested at the basin scale and between different basins, with samples selected from sites in the Yazoo Basin and the Ohio River Valley. The sites are located along multiple drainages and date from the Late Woodland, the Mississippian and the Fort Ancient periods. Both methodological approach and results are presented and the following aspects are discussed: the evaluation and the impact of diagenesis, the identification of discriminant elements and the variability of elemental and isotopic geochemistry signature within a basin or between basins, the comparison of geochemical signatures of shell temper and whole shells, and the possibility of chemical exchanges between the clay and the shell temper.

**Resendez, Andres (University of California, Davis)**

[25]

*The Greatest Slave Revolt of the American Southwest*

In the spring of 1680, the Pueblo Indians of New Mexico devised an audacious plan of liberation. They would rise up on the same day and kill all its friars and civil authorities, burn down its churches, destroy its Christian images and rosaries, and unmake all Christian baptisms and marriages. In one decisive coup, these Natives would erase most traces of the Spanish presence in the region. Although many scholars regard the Pueblo Revolt of 1680 as unique and extraordinary, it actually belongs in a large canvas of Indigenous insurrections that rocked Mexico and the American Southwest in the sixteenth and seventeenth centuries. This presentation will examine how the semi-agricultural and hunter-gathering inhabitants of this large region initially pledged allegiance to the Spanish Crown and, at least nominally, became a part of the empire. But with the passage of time, they came to reject the colonial regime and its coercive labor practices and ended up resorting to all-out rebellion to survive.

**Rest, Matthaeus and Christina Warinner (Harvard University)**

[148]

*Breaking Out of the Mold*

Publication in high-tier, high-impact science journals is highly constrained by limits on structure, word count, and number of references, as well as constantly shifting restrictions on the nature and form of supplementary information. While the benefits of publishing in high-impact journals are many, the limitations imposed by the publication model contribute to and exacerbate disparate power dynamics, contention, and misunderstanding between collaborators on large, multidisciplinary archaeological science projects. Here we outline and discuss problems with the current model and make suggestions for how archaeologists, scientists, and journals could work together to broaden and enrich the archaeological science publishing landscape.

Reuther, Joshua [31] see Sattler, Robert

**Reyes, Idalí (Cuban Institute of Anthropology), Yadira Chinique de Armas (University of Winnipeg), Roberto Rodriguez Suarez (Cuban Institute of Anthropology), Jason Laffoon (Leiden University) and Ulises Gonzalez Herrera (Cuban Institute of Anthropology)**

[125]

*Dietary Practices and Plant Resource Management of the Precolonial Low-Level Food Production Population of Playa del Mango (Granma, Cuba)*

Paleoethnobotanical studies in the Antilles have demonstrated the production and management of plants in populations traditionally considered “fisher-gatherers.” In this paper, we combined the stable isotope analysis ( $\delta^{15}\text{N}$ ,  $\delta^{13}\text{C}_{\text{co}}$ ,  $\delta^{13}\text{C}_{\text{en}}$ ,  $\delta^{13}\text{C}_{\text{cap}}$ ) of 27 individuals from the precolonial site of Playa del Mango (Granma, Cuba) with the identification of starch grains in their dental calculus, and in residues extracted from a drilled artifact. The stable isotope results indicated that the population had a 70:30  $\text{C}_3/\text{C}_4$  diet, where at least 65% was based on  $\text{C}_3$  protein. Statistically significant differences between females and males in the carbon isotope composition of diet, and its energy portion, suggests a differential consumption of plants by sex. Plants similar to those reported in precolonial archaeological sites of Costa Rica, Panama, and Colombia were identified (e.g., Marantaceae, Fabaceae, possibly *Zamiaceae*, *Ipomoea batatas*, *Manihot esculenta*, *Capsicum* sp., *Zea mays*). These results represent the first report of cassava and chili pepper in low level food production for an Indigenous population from Cuba, confirming that important plants in the economy of the Neotropics were circulating in the southeast region of Cuba since at least cal 8 BC–AD 352 ( $2\sigma$ ).

Reynolds, Sally [184] see Bennett, Matthew

Rice, Don [53] see Rice, Prudence

**Rice, Prudence (Southern Illinois University) and Don Rice (Southern Illinois University, Carbondale)**  
[53]

*"Temple on the East": A Historical Look*

Marshall Becker's 1971 doctoral dissertation first identified the now well-known Plaza Plan 2 (PP2) architectural grouping at Tikal. This quadrangular configuration, with a tall, square, pyramidal temple structure on the east side, is important in Classic period residential settings in many parts of the lowlands. Marshall also suggested it was a template for civic-ceremonial architecture going back to Preclassic period E-Groups, which also highlight east-side temples or temple-like structures. Here, we show that this template's significance endured into the lowland Late Postclassic period as manifest in its architecture. This is evidenced by structure configurations known as "temple assemblages" not only at Mayapán, but also in the central Petén lakes regions. In the lakes area, these complexes were built by the Kowoj, enemies of the local Itzas, and symbolized their deep Petén identity.

**Rich, Michelle (Dallas Museum of Art), David Freidel (Washington University in St. Louis) and Olivia Navarro-Farr (College of Wooster)**

[188]

*World-Making: Turtle Mountain and the Oracle of Waka'*

Wendy Ashmore, in collaboration with Jim Brady, wrote about the living mountains of the Maya recognizing that animate spaces and places could be world-makers. We identify three living mountains defining Waka's sacred landscape: Structure M12-32, the Wak Witz or Centipede Mountain; K'ahk' Witz, the Fire Shrine wiinte'naah of the city center situated at Structure M13-1; and Ahk Witz, Turtle Mountain, the terraformed Mirador Hill looming above the city from its southeastern corner. We propose Teotihuacano lord Sihyaj K'ahk' journeyed to Waka' explicitly because of its sacred landscape, and he "arrived" in January 378 CE to consult an oracle regarding his establishment of hegemony in the Maya world before going on to conquer Tikal eight days later. Informed by a relational ontological approach, we trace the evidence for Waka's role as a place of oracle and prophesy for figures such as Sihyaj K'ahk' in the Early Classic, as well as the great queens and kings of the Late Classic, by examining the aforementioned sacred landscape in tandem with recent archaeological, iconographic, and epigraphic evidence.

Rich, Michelle [153] see Navarro-Farr, Olivia

Richard, Jean-Francois [223] see Birch, Jennifer

Richard, Maïlys [191] see Falgueres, Christophe

Richards, John [178] see Skinner, Jessica

**Richards, Katie (Washington State University)**

[208]

*A Multiscalar Approach to Understanding Fremont through Painted Ceramics*

What "Fremont" means and the relationship between the Fremont region and the greater Southwest has been the subject of debate for over a century. Fremont material culture was strongly influenced by the Southwest; however, it is also distinct from the Southwest in many crucial ways. Frontier studies provide a dynamic and powerful way to explore the complex blend of innovation and tradition present in the Fremont region. This study uses ceramic data to better understand Fremont as a frontier region and to explore Fremont identity and social organization. Ceramics can provide crucial insight into interconnectivity and identity. I use a multiscalar approach to explore how and where painted pottery was made, identify networks of exchange, and examine how pottery was used at villages across the region. I utilize INAA as well as design analysis of painted pottery to explore Fremont origins, social organization, and identity on this northern frontier.

Richards, Katie [225] see Allison, James

**Richards, Marie (Michigan Technological University)**

[141]

*Wiisnidaa (Let's Eat): Anishinaabek Food Sovereignty and Resilience in Michigan's Straits of Mackinac*

Using archaeology and ethnohistory in new ways can work to shift understandings of traditional cultural landscapes, especially against a colonial backdrop. The approach presented in this paper seeks to strengthen our understandings of Indigenous food sovereignty today. Traditional cultural landscapes comprise multiple layers of cultural knowledge and experience. However, Indigenous food systems—that comprise a space as both resource and spiritual—are often relegated to the background of other activities. In this paper, we examine the shifts in the food landscape of the Anishinaabek of the Straits of Mackinac (Michigan) and the role of storywork to contextualize the role of food sovereignty in cultural resiliency. This paper offers new approaches to using archaeological data that is in service to and by Indigenous communities. Drawing on the archaeological record, we show resiliency and food sovereignty through storywork (interview through storytelling). Historical accounts captured these changing landscapes

through the settler lens, excluding Indigenous perspectives. However, by integrating Indigenous practices of oral tradition into archaeological investigations, we build a greater understanding of food sovereignty as Indigenous resiliency. This preliminary work contributes to a larger body on Indigenous methodologies in understanding food sovereignty in shifting traditional cultural landscapes of Straits of Mackinac.

Richards, Michael [198] see Cooper, Catherine

**Richards, Nicholas (UDC Inc.) and Patricia Richards (University of Wisconsin–Milwaukee)**

[178]

*The Iron Coffin: An Artifact Out of Place and Time Recovered from the Milwaukee County Poor Farm Cemetery*

The 2013 archaeological excavations at the Milwaukee County Poor Farm Cemetery (MCPFC) revealed that burial was unelaborated. For the poor and indigent buried in this cemetery, it was the Board of Supervisors of Milwaukee County who, by the late 1800s, contracted local undertakers to supply the MCPFC with burial containers. This practice of contracting for construction of coffins continued until the turn of the last century when coffin construction was undertaken by inmates of the Almshouse and the Insane Asylum. In order to contain costs, both private undertakers and county craftsmen used the least expensive material and hardware. All but one of the juvenile-sized coffins excavated in 2013 were wood. The notable exception was a cast iron coffin. Preliminary analysis suggests this coffin was out of style and common use at the time of interment. This paper uses contemporary records to identify potential businesses of funeral directing, embalming, and livery services who may have provided such a curious coffin. Archaeological and osteological context, as well as historical documentation, is utilized to explore how a child whose family could not provide a traditional cemetery interment was nonetheless buried in a cast iron coffin.

**Richards, Patricia (University of Wisconsin–Milwaukee)**

[178]

*The Thumb Screws: Decorative Mortuary Hardware Recovered from the Milwaukee County Poor Farm Cemetery*

Coffin hardware recovered from nineteenth- and early twentieth-century cemetery excavations serve as temporal, economic, and social markers. The Milwaukee County Poor Farm cemetery burials were carried out by Milwaukee County officials as part of a county-mandated and county-funded program. Consequently, the identity of the individuals interred there can be understood at least in part as being constructed or negotiated by the community rather than individual families. While the vast majority of coffins and coffin hardware represents the desire on the part of Milwaukee County officials to be fiscally frugal, there are a few notable exceptions to the utilitarian nature of the coffin hardware recovered from the Milwaukee County Poor Farm excavations. In addition to several decorative lead coffin handles, thumb screws recovered from three burial locations out of a total of almost 2,400 excavated burial locations, represent some of the very few instances of decorative mortuary hardware. One of these burials is that of Gertrude West whose remarkable story is used to interpret the remaining two unidentified burials. Artifact, osteological, and spatial data are analyzed in order to understand the unidentified individual interments in light of what is known about the historical context of the Gertrude West burial.

Richards, Patricia [178] see Richards, Nicholas

Richards, Patricia [178] see Skinner, Jessica

**Richards-Rissetto, Heather (University of Nebraska-Lincoln)**

[54]

*Exploring Inequality in Ancient Maya Cities: A 2D and 3D Procedural Model Computational Comparison of Households at Copan, Honduras*

In the Maya region, we know that inequality exists across and within communities, cities, and regions, and yet as archaeologists, we struggle to identify inequality in everyday experiences. I narrow this challenge by exploring urban dynamics in the Late Classic period at Copan. At Copan, the Harvard Typology, which classifies sites into five types primarily based on number of mounds, mound height, and construction materials, is often used as a proxy for socioeconomic status. In this paper, I employ Gini coefficients and Lorenz curves using 2D geospatial data to calculate variation within household size to explore inequality. Subsequently, I compare the results to the Harvard Typology classifications. Finally, I use a 3D procedural modeling approach calculating architectural volume and construction materials as another alternative proxy for household wealth. While in early stages, comparisons of 2D and 3D methodological and interpretive comparisons on inequality in the daily lives of the ancient Maya, offer data and findings to continue efforts on a deeper understanding of the nuances of ancient Maya society

**Richards-Rissetto, Heather (University of Nebraska-Lincoln)**

[204]

*Chair*

**Richter, Kim (Getty Research Institute)**

[55]

*Elite Faces and Bodies of Stone: Portraiture in the Postclassic Huasteca*

According to modern Eurocentric understanding, portraiture is an individual's likeness that captures the sitter's actual physical attributes, whether realistic or idealized. Portraits may also reveal a person's inner emotions and character or indicate social status based on clothing, accessories, setting, name, or title. They capture a person's individuality. But in many societies, a person's individual identity may not be as critical as it is in the modern Western world. Collective identity and status often are more significant. Consequently, if a person's representation does not capture his or her individuality but instead is intentionally deindividualized, does

it fall outside of the definition of a portrait? In cultures that do not employ writing, the distinction between deindividualized portraits and anthropomorphic depictions, such as of deities, becomes even more tenuous. Postclassic Huastec sculptures from the Gulf Coast of Mexico, I argue, fall into this category of portraits of human individuals, although they do not necessarily represent a physical likeness, and nor are they named as individuals. However, the emphasis on high status costumes, which bespeak a cosmopolitan Mesoamerican elite identity, and body modifications, which follow local traditions, differentiate them as historical human beings rather than deities.

Richter, Scott [60] see Egeland, Charles

**Rick, Torben (Smithsonian Institution) and Brian Holguin (University of California, Santa Barbara)**

[151]

*Tracking the Pathways of "Affluent Foragers" and the Land and Seascapes of California's Santa Barbara Channel Region*

[WITHDRAWN]

**Riebe, Danielle (University of Georgia), János Dani (Déri Museum), Gábor Mesterházy (Várkapitányság Nonprofit Zrt), Máté Stibranyi (Várkapitányság Nonprofit Zrt.) and Apostolos Sarris (University of Cyprus)**

[2]

*Mapping the Space, Understanding the Place: Survey and Remote Sensing Techniques Implemented at the Late Neolithic Herpály Settlement Complex of Csökmő-Káposztás-domb*

The emergence of tells at the end of the Late Neolithic in Eastern Hungary has been the focus of several recent archaeological studies, but with little exploration of how these processes differed regionally across the Great Hungarian Plain. Having first modeled strictly enforced sociocultural boundaries during the Late Neolithic between the Tisza and Herpály archaeological cultural units, in 2019 the Prehistoric Interactions on the Plain Project (PIPP) started intensive investigations at the Herpály tell-centered settlement complex of Csökmő-Káposztás-domb. Building off the archaeological methodology employed at other Neolithic sites in the region, this paper presents the various remote sensing techniques (single/multisensor magnetometry, aerial imagery, and lidar) and survey methods implemented at Csökmő-Káposztás-domb. The results generated from the pedestrian survey, ground based magnetometry, and GIS spatial analysis have made it possible to better ascertain the extent and complexity of the site, the distribution of the structures and material culture, and the locations for future excavations. The research at Csökmő-Káposztás-domb will result in a multiscale (site and regional) comparative project investigating variation in the sociocultural and environmental processes between Late Neolithic and Early/Middle Bronze Age tell-forming cultures.

Riehm, Grace [12] see Peres, Tanya

Riekert, William [173] see Mink, Philip

**Riel-Salvatore, Julien (Université de Montréal)**

[120]

*Issues in the Study of the Origins and Diffusion of the Upper Paleolithic in Europe*

In Europe, the earliest phases of the Upper Paleolithic are often seen as linked to modern humans, either as a result of the immigration of *Homo sapiens* bearing Initial Upper Paleolithic industries across the continent or linked to them through various cultural processes, as potentially attested by various "transitional" industries. The picture is complicated by the presence of various facies of the Aurignacian, which are also generally associated with modern humans. Of course, in contrast to other landmasses colonized by *Homo sapiens*, Europe presents the additional challenges of accounting for the presence and eventual disappearance of Neanderthals in the process. This paper presents an up-to-date synthesis of the evidence for the origins and spread of the Upper Paleolithic in Europe, testing the idea of a rapid East-to-West diffusion in light of the most recent data. The paper also highlights open questions about the process resulting from issues due to imprecisions in some dating programs and to the ambiguity of the cultural taxonomies that have framed the issue for over a century.

Riel-Salvatore, Julien [61] see Brun, Catherine

Riel-Salvatore, Julien [61] see Gravel-Miguel, Claudine

Riera-Soto, Camila [200] see Uribe, Mauricio

**Rieth, Amy (Vanderbilt University), Markus Eberl (Vanderbilt University), Phyllis Johnson (Vanderbilt University), Charreau Bell (Vanderbilt Data Science Institute) and Jesse Spencer-Smith (Vanderbilt Data Science Institute)**

[206]

*Machine and Deep Learning Coding Methods Applied in the Identification of Microdebitage Particles*

The project, funded by the DSI-SRP fellowship, investigates the effectiveness of two methods of computer-based soil and microdebitage particle sorting methods. Microdebitage refers to microscopic pieces of stone shrapnel produced by the stone knapping technique used to make weaponry in a litany of historical societies (note: samples used in this study come from Mayan excavation sites in Guatemala, specifically the Nacimiento and Tamarindito sites). In the past, anthropologists have manually sorted and identified microdebitage particles. In recent years, machine learning models have been applied to this task in order to improve

the reliability and efficiency of soil sample analysis. This project compared these two forms of modeling regarding their accuracy in identifying the particle class of various soil samples. Machine learning techniques implemented randomForest and xgboost models using 48 variables collected on 198,600 particles by the PartAn3D analyzer. Initial two-class comparisons between machine learning models revealed similar effectiveness in particle identification. However, the inclusion of chert and sand particle classes displayed a slight increase in accuracy in randomForest model identification over that of xgboost modeling. As such, at this stage of research, the machine learning randomForest method proves most useful in the computer-based identification of soil particles.

Riley, Kurt [66] see Duwe, Samuel

Rimpf, Andrea [193] see Toyne, Jennifer Marla

**Ringle, William (Davidson College, Emeritus)**

[13]

*Looking for Lords in Northern Yucatán*

This paper examines the dynamic of power in northern Yucatán, particularly the Puuc region and central Yucatán. Despite the regional scarcity of hieroglyphic texts or polychrome pottery court scenes, such as undergird much of our current understanding of Classic Maya governance, these areas benefit from a rich ethnohistorical record (sometimes a mixed blessing) and also from the excellent visibility of archaeological features, both on the ground and in remote sensing imagery. Past governance models of the north have either attempted to overlay southern lowland institutions or to project Late Postclassic institutions into the past, with mixed success. Increased settlement data indicates a more dynamic political landscape balancing the interests of a central leadership (the *ajaw* or *kalomte*) with a variety of elite actors. The latter is often manifested in the presence of council houses but is also apparent in household types (especially noble houses), mural painting, and sculpture. Furthermore, at some sites political arrangements seem to have been envisaged as a contract between sectors or estates, such as royal houses, warriors, and client rulers. With greater survey information, we can now begin to detect diachronic changes in these patterns.

Ringle, William [34] see Galvan, Melissa

Ripan, Ripan [68] see Thomas, Ariane

Rippee, Cassandra [131] see Helmer, Elliot

Riris, Philip [120] see Siegel, Peter

**Rissolo, Dominique (University of California, San Diego), Jeffrey Glover (Georgia State University), Roy Jaijel (University of Haifa), Beverly Goodman (University of Haifa) and Patricia Beddows (Northwestern University)**

[154]

*The Hidden Coast of Northern Quintana Roo: Paleoenvironmental Reconstruction of the Ancient Maya Port Site of Vista Alegre*

Ancient Maya ports along the undeveloped northeast coast of the Yucatán Peninsula once supported a network of trade routes linking people, goods, and ideas from across Mesoamerica. The Costa Escondida Project has focused on the complex interrelationships between the ancient Maya and their dynamic coastal environment along the mangrove-shrouded shores of the Laguna Holbox. Central to our interdisciplinary efforts is a paleoenvironmental and paleoecological reconstruction of the key port of Vista Alegre—a low-lying island surrounded by a complex mosaic of coastal ecosystems, sedimentological facies, and hydrological conditions. Sub-bottom profiling sonar surveys and geoarchaeological field methods, such as sediment coring, have made possible multiproxy analyses that enable us to better understand sea-level fluctuations and the morphology of the shoreline and harboring locations over time. Documented changes in mangrove distribution—affecting ecosystem biodiversity, coastal access, and protection from wind swell and storm surge—would have presented the maritime Maya with unique challenges and opportunities.

**Rissolo, Dominique (University of California, San Diego)**

[221]

*Chair*

Rissolo, Dominique [221] see Arano Recio, Diana

Rissolo, Dominique [128] see Glover, Jeffrey

Rissolo, Dominique [221] see Petrovic, Vid

Rissolo, Dominique [177] see Przybyla, Joy

Rissolo, Dominique [221] see Reinhardt, Eduard

Rissolo, Dominique [154] see Steele, Riley

**Rivals, Florent (Institut Català de Paleoecologia Humana i Evolució Social [IPHES])****[191]***Dental Meso- and Microwear of the Aurochs from Neshar Ramla: Paleoecological and Archaeological Implications*

In this study, we present the combined results of dental wear analyses on the aurochs from the Middle Paleolithic sequence at Neshar Ramla, Israel. Mesowear is a proxy averaging diet over months, while microwear reflects the diet of the last days before death. Consequently, each method is giving access to very different periods in life history. The first objective is to integrate the results from mesowear and microwear to provide indirect evidence of the dietary habits of the aurochs and to reconstruct their habitat(s). The second objective is to use tooth microwear patterns as a high-resolution proxy for estimating the duration of mortality events and their seasonality. The microwear pattern fits in between the extant leaf browsers and the grazers. Aurochs were mixed feeders and alternated seasonally from grass to browse. Differences in variability among the different units indicate either short seasonal occupations or long-term occupational events. In unit VI for example, aurochs were killed and brought back to the site during a long-term occupational event or a succession of short term occupations at different seasons of the year. The combination of the two proxies allowed us to investigate changes in diet, habitats, and seasonality throughout the sequence at Neshar Ramla.

Rivera, Ángel Iván [35] see Davila, Caroll

Rivera, Claudia [87] see Bruno, Maria

**Rivera, Francisco (Arctic Studies Center, Smithsonian Institution)****[35]***UAV Photogrammetry and 3D Modeling of the Historical Fishing Heritage of Rivière-Saint-Paul, Canada*

The current research project carried out in Quebec's Lower North Shore in Canada focuses on a nineteenth–twentieth-century guano (fertilizer) factory and an industrial fishery that operated from 1855 to 1960 at Rivière-Saint-Paul, a village near the Strait of Belle Isle. Rivière-Saint-Paul is situated on the periphery of the world's major industrial centers, counting only a few hundred souls. Nevertheless, it was part of a globalized world defined by industrial and capitalist expansion. Its archipelago peripheral spaces concentrated regional labor forces and transformed resources wrested from the sea. The local descendant community strongly bases its identity and its sense of place and history on this period of industrial activities. UAV photogrammetry and 3D modeling have allowed for an efficient, expedited, and (relatively) low-cost strategy for mapping and surveying historical sites associated with the abandoned fisheries as well as their maritime landscapes. The uses of digital technologies and 3D modeling allow for the development of an archaeology of the recent past in Quebec's Lower North Shore, reinforcing the interdisciplinary potential of archaeology, ethnography, and history in the recent past and its ongoing effects.

**Rivera I., Arturo and Sarah Baitzel (Washington University in St. Louis)****[92]***Highland Hunters and Fishing Folk: Insights into the Prehispanic Lithic Assemblage of the Middle Sama Valley (Tacna, Peru)*

The western valleys of the south-central Andes acted as corridors for human and animal mobility from the Archaic period to the present day. Stone tools recovered during pedestrian survey conducted in 2017–2019 in the middle Sama valley (Tacna, Peru) bear witness to the enduring presence of humans in this area since the Archaic period. The identification of a diversity of tool forms and styles confirms the importance of oasis valleys and lomas for understanding hunting and processing activities from the Archaic period to the Late Horizon. The Sama Valley lithic assemblage and its variable raw materials suggest the development and specialization of an expedient technology of stone tool making due likely in relation to seasonal transhumance.

**Rivera Prince, Jordi (University of Florida)****[82]***Salinar in the Wake of Chavín: The Emergence of Social Inequality in the North Central Andes at La Iglesia (400–200 cal BC), Moche Valley, Peru*

In the Central Andes, the Early Horizon Chavín (800–400 cal BC) expressed power and ideology largely through monumental architecture of religious and political importance. Chavín had pan-Andean influence, stratified through geographically concentrated power at these monumental sites (Burger 1992:229). However, ca. 500/400 cal BC Chavín “collapsed,” and the north-central Andes underwent a period of marked reorientation from the way of life that existed before. Changes include the abandonment of monumental centers, urbanization, settlement reorganization, population growth, changes in food patterns, increased social violence. Importantly, wealth, status, and “local elites” emerged at multiple smaller regional centers—marking the potential beginnings for social inequality and setting the foundation for subsequent polities and states (e.g., Moche and Chimú). In the Moche Valley this period is referred to as Salinar. I discuss bioarchaeological and mortuary evidence for social inequality at Salinar cemetery La Iglesia (400–200 cal BC) in Huanchaco, La Libertad, North Coast of Peru. Although La Iglesia is of a small-scale fishing community, burial evidence suggests the presence of local elites and social inequality even in non-urban coastal sites. The La Iglesia Salinar burials are contextualized within existing interpretations this elusive time period. Human remains will be shown in this presentation.

**Rivera Prince, Jordi (University of Florida)****[82]***Chair*

**Rivera-Collazo, Isabel (University of California San Diego) and Mariela Declet-Pérez (University of California San Diego)**  
[125]

*What Happened to the Reefs? Subsistence Changes and Environmental Dynamics in Puerto Rico*

Changes in diet in ancient periods are often explained as a product of human impacts on the environment, often due to over-exploitation. However, other environmental dynamics can impact resource availability, especially affecting sensitive ecosystems during times of changing climate. While food-choice is certainly a cultural decision, ensuring food security could affect the range of resources exploited during times of environmental crises. Therefore, ecological dynamics during climate change could also be codified in the archaeological record of food remains as evidence of human decision-making through difficult times. In this presentation, we use the framework of differential social vulnerability to explore the temporal coincidence of environmental and climatic changes, coupled with evidence of recurrent disasters impacting indigenous settlements, and explore how these changes reflect local decision-making to support food security. To these ends, we explore fish, mollusk, and coral assemblages to investigate the health of marine ecosystems and human maritime culture at a time of climate change in Puerto Rico (AD 900–1100).

**Rivera-Collazo, Isabel (University of California San Diego)**

[212]

*Discussant*

Rizzuto, Branden [109] see Holyoke, Kenneth

**Roa, Ian (University of Pittsburgh), Claire Ebert (University of Pittsburgh), Julie Hoggarth (Baylor University), Jaime Awe (Northern Arizona University) and Rafael Guerra (University of New Mexico)**

[96]

*Isotopic Evidence for Human-Animal Ritual Engagement in the Eastern Maya Lowlands*

In the ancient Maya world, animals played a fundamental role in mythology and religion, and their symbolic value meant that animals were agents rather than items for subsistence. Animals were also important in ritual and political activities for the Maya, where they were consumed at feasts and left as offerings at altars and in burials. This project uses oxygen ( $\delta^{18}\text{O}$ ) and carbon ( $\delta^{13}\text{C}$ ) stable isotope analyses of enamel to reconstruct movement and diet of animals from ritually significant contexts to examine ancient animal engagement. While  $\delta^{18}\text{O}$  values represent ecological conditions present where the animals originated,  $\delta^{13}\text{C}$  reflect the total diet of the individuals. Specimens represent seven taxa, ranging from dog to crocodile from four sites in the Belize River Valley of western Belize, providing a regional perspective on human-animal engagement. The ritual contexts include burials, caches and other special deposits that span the occupational history of the Belize River Valley for more than 1,500 years from the Middle Preclassic (900–300 BC) to the Terminal Classic (AD 750–900/1000). The results address hypotheses about whether these animals were traded along distances, fed while in captivity, and shed light on ritual activity during critical transitions in Maya prehistory in the Belize Valley.

Robear, Paul [89] see VanPool, Todd

**Roberts, Jerod (Texas State University)**

[146]

*Assessing the Variability and Chronology of Red Linear Style Pictographs of the Lower Pecos Canyonlands of Texas: Preliminary Results*

This paper aims to further define the characteristics of Red Linear style (RLS) anthropomorphic figures and establish its temporal relationship with other regional rock art styles of the Lower Pecos Canyonlands of Texas and Coahuila, Mexico. In 2013, Boyd et al. presented a list of diagnostic attributes for the RLS based on data collected from 444 figures across 12 sites. In addition, their study identified 38 Red Linear figures under Pecos River style (PRS), relatively dating RLS as older than or contemporaneous with PRS. This paper will expand on Boyd et al.'s dataset to include an additional 20 RLS sites documented during Shumla's Alexandria Project. The expanded dataset will provide the opportunity to test Boyd et al.'s conclusions and improve the defining attributes of Red Linear anthropomorphs. To establish Red Linear style pictographs into temporal context, I selected seven anthropomorphs depicting clear diagnostic RLS attributes for accelerator mass spectrometry (AMS) dating. Although seven dates are not enough to determine a comprehensive chronology of Red Linear pictographs, it provides a solid foundation using absolute dating methods, crucial to future research throughout the region. This paper discusses the preliminary results as part of an ongoing master's thesis.

**Roberts, Tyler (Kutztown University), Amber Carroll (Kutztown University) and Khori Newlander (Kutztown University)**  
[39]

*Distinguishing between Historic Glass Makers in the Middle Atlantic Using Portable X-Ray Fluorescence Spectrometry*

In this study, we employ portable X-ray fluorescence spectrometry (pXRF) for the compositional analysis of glass bottle fragments recovered from Stoddartsville, an early nineteenth-century milling village built along the upper Lehigh River in northeast Pennsylvania. Our analysis demonstrates that we can use compositional data to distinguish between different glass makers. We then use these data to source glass bottle fragments back to their makers, thereby documenting the links developed between Stoddartsville and the surrounding region as the village grew into a short-lived center of trade and industry. At a more general level, our study demonstrates the potential for historical archaeologists to use compositional data to define the "recipes" used by historic glass makers that, even in the absence of makers' marks, allow us to source historic artifacts and, in turn, develop insights into regional economies.

Roberts, Tyler [39] see Carroll, Amber

**Robin, Cynthia (Northwestern University)****[156]***Wendy Ashmore: Pioneer and Role Model*

Entering graduate school in the early 1990s I was drawn to study with Wendy Ashmore due to her pioneering role in the development of the fields of household and settlement archaeologies. I was inspired by Wendy's work because it opened up so many new possibilities to understand a society from the perspectives of the full range of people who lived there. What I found in Wendy was so much more: a role model for everything I would do henceforth. This paper addresses the archaeology of everyday life and examines why the things that people do in their daily lives matter in the constitution of human societies. It focuses on ordinary people in ancient Maya society, how they made a difference in the past, and were not the mere pawns of history or prehistory. I present two case studies of farmers at Chan and urban residents of Aventura to suggest lessons from prehistory about social and environmental sustainability gleaned from the everyday lives of ordinary people in the past.

**Robinson, David (University of Central Lancashire), Ana Ejarque (French National Centre for Scientific Research), Devlin Gandy (University of Cambridge), Lynne Dennany (University of Strathclyde) and Matthew Baker (University of Strathclyde)**  
**[89]***Datura Quids and Rock Art: New Insights from Pinwheel Cave, California*

Work at Pinwheel Cave, California, has demonstrated the first unambiguous consumption of an hallucinogen at any rock art site in the world as seen in *Datura* quids identified in the ceiling of the shelter. In this presentation, we present further analyses of the quids, including palynology, as well as pottery analysis and the astronomy of the site. These findings provide more detailed understandings of the quids, the rock art, and the social use of the cave. Importantly, we highlight the importance of the site as a place of deep ancestral importance to contemporary Native Americans.

**Robinson, Mark (University of Exeter)****[200]***"Moving South" Late Pleistocene Plant Exploitation in the Colombian Amazon*

The role of plants in early human migrations across the globe has received little attention compared to big game hunting. Tropical forests in particular have been seen as a barrier for Late Pleistocene human dispersals due to perceived difficulties in obtaining sufficient subsistence resources. Archaeobotanical data from the Cerro Azul rock outcrop in the Colombian Amazon details Late Pleistocene plant exploitation providing insight into early human subsistence in the tropical forest. The dominance of palm taxa in the assemblage, dating from 12.5 ka BP, allows us to speculate on processes of ecological knowledge transfer and the identification of edible resources in a novel environment. Following the hypothesis of Martin Jones from his 2009 work, "Moving North: Archaeobotanical Evidence for Plant Diet in Middle and Upper Paleolithic Europe," we contend that the instantly recognizable and economically useful palm (family *Arecaceae*) provided a "gateway" to the unknown resources of the Amazon forest.

Robinson, Mark [154] see McKillop, Heather

Robles, Jasinto [174] see Castañón-Suárez, Mijaely

**Robles García, Nelly (Instituto Nacional de Antropología e Historia)****[73]***Análisis de los espacios públicos: Plazas, templos y juegos de pelota en Atzompa*

Como elementos integrantes de la traza y la arquitectura del conjunto monumental de Atzompa en Monte Albán, las plazas, los templos y los juegos de pelota, resultan ser espacios fundamentales para comprender la dinámica de la vida ritual de la ciudad. Las plazas, espacios definidos por la simetría de los templos, constituyen la unidad de análisis espacial; a partir de su ubicación, dimensiones y características urbanas, discernimos sobre sus funciones específicas y asociación ritual. Los templos, que muestran una evolución arquitectónica con cambios conceptuales importantes en su arquitectura en las épocas más tardías, nos muestran que la relación entre sus componentes (basamento, talud-tablero, escalinata-alfardas), materializan su importancia religiosa y social. En cambio, mediante su ubicación espacial, dimensiones y escala, los juegos de pelota, nos ubican en la diferenciación de lo público y lo privado, y en su importancia indiscutible para interpretar la traza urbana de la ciudad desde un punto de vista cosmogónico.

**Robles García, Nelly (Instituto Nacional de Antropología e Historia)****[123]***Discussant***[73]***Chair***Rock, Barrett and James Chatters (Paleoscience)****[221]***Analysis of Wood Cellular Structure in Early Holocene Charcoal Fragments from the Yucatán Reveals Post-Glacial Human Activity and Forest Composition*

Collapsed chambers within submerged limestone cave systems of the Yucatán Peninsula known as Outland and Sagitario, contain an abundance of charcoal fragments that have been collected and radiocarbon dated to 9–12 ka. Many of these charcoal fragments retain well-preserved cellular details that have been used to identify the secondary xylem (wood) of tree species that produced the charcoal. A scanning electron microscope analysis has been conducted to identify detailed cellular characteristics and taxonomically

diagnostic wood anatomical features. To date, fragments have been tentatively assigned to 10 tropical and subtropical tree species similar to those currently found on the Yucatán and the Florida Keys. All wood species identified from charcoal of the Sagitario system exhibits large areas of rupture associated with vascular rays composed of resinous idioblasts, suggesting selective use of these woods as torches, while charcoal from the Outland system lacks such features. Work in these cave systems demonstrates evidence of human ochre mining activity in Sagitario, and the Outland record will produce a detailed record of the early Holocene Post-Glacial forest composition on the Yucatán Peninsula.

**Rockman, Marcy (Co-Equal/University of Maryland)**

[127]

*How to Write a New Narrative for Policy, Climate, and Archaeology*

From one perspective, policy is an outline of a story about the way we want the world to be. From another, policy is the story of the way the world is, regardless of what has been said about what we want. Climate change is a story that is being told mostly through hard sciences, which is leaving gaps in effective policy because modern climate change has come about through human behavior. Archaeology combines a range of methods to better understand connections between humans themselves and climate and environments in the past up to the present. But currently, policy for archaeology and findings from archaeology as communicated to policy makers are not well aligned to support meaningful climate action. This paper uses an approach of story and storytelling with evidence from federal and international climate work to recommend ways in which policy, climate, and archaeology can be more usefully combined.

**Rockwell, Heather (Salve Regina University) and Madeline Mackie (Weber State University)**

[136]

*An Employment Crisis among Anthropology PhDs: Considering Program Size in Rates of Faculty Job Placement*

Job placement trends in higher education at US institutions are bleak. Within anthropology and other social science disciplines this problem appears to be particularly pronounced. Speakman et al. in their 2018 articles show that an oversaturated PhD market has made positions incredibly competitive but that not all programs appear to offer an equal shot at employment. Speakman's results suggest that graduates from programs such as the University of Michigan, Chicago, and Harvard appear to hold most of the jobs market shares. This paper seeks to expand on the work of Speakman et al. by examining not just the market share held by each program but also the number of students each program graduated. Our results suggest that while large programs do indeed command the largest share of the job market, much of this may be a product of high numbers of graduates from these programs.

**Roddick, Andrew (McMaster University)**

[129]

*Discussant*

[87]

*Chair*

Roddick, Andrew [87] see Nash, Donna

Roddick, Andrew [87] see Vranich, Alexei

**Rodgers, Emily**

[167]

*Petrographic and Geochemical Insights into Ceramic Technology and Provenance on the Paria Peninsula, Venezuela*

This study integrated macroscopic, petrographic, and geochemical analytical techniques to analyze ceramic assemblages from two sites, Quebrada de Balerio and La Alquería, on the Paria Peninsula, Venezuela. The Paria Peninsula is considered a transitional location in the migration of the Saladoid people from the Lower Orinoco to the islands in the Caribbean. Within these assemblages, all of the ceramics stylistically aligned with the Saladoid series, except for one Barranoid series sherd. Petrographic analysis, X-ray fluorescence, and scanning electron microscopy were used to interpret the provenance of the ceramics, ceramic production methods, and possible correlations between material selection and decorative techniques. The results indicate that the Saladoid series sherds were produced locally, while the Barranoid series sherd was produced elsewhere. Analysis of the decorative slips and of the grog inclusions revealed a continuity of the ceramic technology and materials source locations within the sites. The integrated analytical approach of this preliminary study displays the potential for future archaeometric studies of ceramics relating to the migration of the Saladoid people.

Rodler, Alexandra [155] see Kostomitsopoulou Marketou, Ariadne

**Rodning, Christopher (Tulane University) and Stephen Acabado (University of California, Los Angeles)**

[143]

*Chaos Theory, Complex Adaptive Systems, and the Archaeology of Indigenous Responses to Global Spanish Colonialisms*

Historical and archaeological narratives often favor interpretations that conquered groups yielded to the political and economic might of colonizing powers. Recent models in archaeology, however, emphasize that Indigenous responses to colonialism are more complex than succumbing to colonial and imperial hegemony, and that Indigenous peoples significantly shaped the trajectories of culture contact. This paper considers the applicability of chaos theory and complex adaptive systems modeling toward explaining Indigenous engagements with Spanish colonists in the North American Southeast and in the Philippines. These cases offer examples of Indigenous groups making decisions and pursuing strategies meant to ensure that local communities would both

survive and thrive in changing geopolitical landscapes, including cases in which groups resisted or accommodated colonial enterprises, or both at once. For example, the Ifugao of the Philippines shifted from dry-rice to wet-rice cultivation after Spanish contact. Although the Spanish colonial regime favored wet-rice cultivation, this practice generated monetary power and political capital for the Ifugao, and enabled successful resistance by the Ifugao to Spanish colonial hegemony. Archaeological and historical sources illustrate that Native American groups navigated and managed the Spanish colonial presence in the US Southeast within Indigenous frameworks of warfare and diplomacy, trade and exchange, and monumentality.

**Rodning, Christopher (Tulane University)**

[27]

*Discussant*

[143]

*Chair*

Rodríguez-Álvarez, Xosé-Pedro [187] see de Lombera-Hermida, Arturo

**Rodríguez Osorio, Daniel (University of Minnesota), Andres Agudelo Bermudez (Universidad Nacional de Colombia, Medellín) and Marion Weber Scharff (Universidad Nacional de Colombia, Medellín)**

[78]

*OBIA and the Analysis of Ancient Stone Masonry: Some Advances from the Sierra Nevada de Santa Marta (Colombia) Case*

OBIA is a relatively new approach within archaeology that has been used in remote sensing and biomedical science to enhance the analysis and classification of complex imagery. It offers a consistent solution to some of the shortcomings identified in cell-based classification approaches, including the “salt-and-pepper effect,” the difficult inclusion of topological relationships in classification, and the limited analysis posed by raster resolution. This paper presents the preliminary results of utilizing OBIA to boost systematic architectural analysis of ancient stone masonry at the Sierra Nevada de Santa Marta (Colombia). It argues that for OBIA to become a fully applicable methodology within the discipline, it is necessary to consider the categories and theories used by archaeologists to inform the processing stages of this approach. Accordingly, the paper provides an overview of the way in which we incorporated theoretical interests and fieldwork knowledge collected in the past four decades by archaeologists working in the SNSM to the OBIA classification of ancient masonry.

**Rodríguez Ramos, Reniel (Universidad de Puerto Rico)**

[19]

*Discussant*

Rodríguez-Rellán, Carlos [146] see Fábregas Valcarce, Ramón

Rodríguez Rodríguez, Karla Fernanda [174] see Ibarra López, Miguel

Rodríguez Suarez, Roberto [125] see Reyes, Idalí

**Rodríguez Yábar, Alexis**

[74]

*Una lectura desde la etnicidad: Entendiendo el fenómeno Paracas desde el valle de Chíncha*

La “Cultura Paracas” es un tópico que tomó principal relevancia para la arqueología andinista luego del descubrimiento de complejas momias enfardeladas en la Península de Paracas hacia la década de 1920. En dichos complejos destacó la presencia de textiles finamente decorados y vasijas de gran formato, los cuales se utilizarían como principales indicadores para definir la presencia de ocupaciones Paracas en la costa sur de los Andes Centrales. La importancia de estos indicadores se tradujo posteriormente en el desarrollo de investigaciones que abordarían desde enfoques historicistas-culturales la cerámica y los textiles Paracas como sus principales objetos de estudio. A su vez, dichos abordajes implicarían una serie de problemas relacionados con una percepción “estática” de este fenómeno cultural. Recientes trabajos relacionados con distintos sitios Paracas han comenzado a sugerir diferencias materiales sustanciales, así como complejas dinámicas entre distintos valles la costa sur. Este trabajo plantea cuestionar la sugerida inmovilidad asociada a la “cultura Paracas” en el Formativo Final (400-200 aC), centrándonos principalmente en el estudio de la cerámica. Para esto, se utilizarán datos relacionados con las ocupaciones Paracas de espacios público-ceremoniales en los valles de Chíncha e Ica, que serán abordados desde una aproximación a la etnicidad en la arqueología.

**Rodríguez-Zariñán, Nora (Escuela de Antropología e Historia del Norte de México)**

[14]

*Connectivities in Southwest/Northwest/Mesoamerica: Displacement, Provision, and Ritual Practice in the Ethnographic and Archaeological Record*

I use “Southwest/Northwest/Mesoamerica” as a way to indicate the intrinsic connectivity that existed between these areas. In this sense, human displacements or movement on the landscape motivated by provision and/or ritual practice are just some of many examples of the connection pathways that are evident between apparently discontinuous or distant regions. I approach these themes herein through the ethnographic record with two objectives. The first objective is to highlight the innate mobility of Native

groups while the second is to reflect on the archaeological footprints left by these movements to help determine to what extent their study can explain the archaeological material record that often is considered to be allochthonous. Consequently, the foregoing dialogue invite us to reflect on the applicability of our concepts of borders, cultural areas, restricted geographies, and even what is considered to be distant—concepts that are typical of Western thought with Cartesian roots but not characteristic of an Amerindian ontology.

**Rodríguez-Zariñán, Nora (Escuela de Antropología e Historia del Norte de México)**

[14]

*Chair*

**Roemer, Erwin**

[56]

*Consulting Tribes on Cultural Resources Not National Register-Eligible*

For federal lands in the United States, including military lands, the majority of consultation with federally recognized tribes is framed under compliance requirements of the National Historic Preservation Act and its planning process of Section 106. The consultation relationship between a given military installation's leadership/technical staff and tribal counterparts hinges on whether the cultural resources involved are, or are not, "historic properties" in the sense of Section 106 terminology: a prehistoric or historic district, site, etc., included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the US Department of the Interior. This presentation will address the challenges this consultation structure brings to both US government and tribal viewpoints on what constitutes optimal management and protection of cultural resources, including current trends in government-to-government relations that increasingly put pressure on this baseline for collaborative negotiations.

**Roemer, Erwin**

[56]

*Discussant*

Rogers, Michael [90] see Leiss, Amanda

Rogers, Thatcher [215] see Crary, Joseph

Rogers, Thatcher [86] see Gilman, Patricia

Rogers, Thatcher [14] see Thompson, Marc

Rogoff, David [104] see Kurnick, Sarah

Rogoff, David [96] see Puente, Nicholas

Rojas Vega, Carol [214] see Plekhov, Daniel

**Roksandic, Mirjana (University of Winnipeg)**

[19]

*Discussant*

**Roldan, Jonathan and Lydia Wolfe**

[110]

*Locating a Marketplace at the Ancient Maya City of Lakamha, Mexico, Using the Configurational Approach*

In some cases, plazas that undergo archaeological testing for marketplace activity are identified using a method known as the configurational approach. This preliminary research method compares plaza locations to a list of associated features, often treated as a list of criteria. However, this approach has been criticized for its speculative nature and the equifinality of the results. Additionally, some argue that these "criteria" are only a list of assumptions. Until now, the configurational approach has received little attention due to its limitations and speculative nature, yet it remains an integral part of the preliminary process in marketplace research. This project will compile the criteria list(s) that have been previously proposed and will be compared to those marketplaces previously identified elsewhere in the Maya region. Our study sets out to determine if some, all, or no features in the list are indeed associated with marketplaces. Then, the "criteria" list will be tested against plazas at Lakamha' to narrow down a potential location for future investigations. The collection of empirical data recorded here is expected to create stronger criteria associated with marketplaces. Furthermore, identifying which architecture is most often associated with marketplaces, allows us to minimize any ambiguity during the preliminary process.

Roldan, Jonathan [96] see Rutherford, Cady

Román, Edwin [128] see Garrison, Thomas

**Roman-Ramirez, Edwin (Proyecto Arqueologico del Sur de Tikal)****[11]***"Long Live the New King": Tikal during Times of Abandonment, Political Instability, and the Emergence of the Classic Period Dynasties (100–378 CE)*

Studies on the southern Maya Lowlands have shown that throughout its history at least two extensive periods of abandonment and migration happened that sparked dramatic changes in the region. The first occurred during the first century and the second occurred during the tenth century. While both episodes took place in the city of Tikal, each brought different destinies upon this metropolis. This presentation will focus in the first episode, which gave way for Tikal to emerge as the dominant power in the region. The process of becoming such an important city was not quick and easy, since it was a period of regional political instability, which caused a warlike environment, which led to the selection of new defensive landscapes for the Early Classic settlements. Despite the turbulent times, Tikal continued to grow. I propose one of the factors that contributed to Tikal's rise to power was the city's continuous access to a water source throughout the year. Another important factor that allowed for Tikal's growth was the collapse and abandonment of the neighboring cities of El Palmar and Uaxactun. Lastly, as Tikal grew its government shifted to a new political order, characterized by the ideology of "divine rulers."

Romero, Danielle [86] see Roth, Barbara

**Romo-Caballero, Carlos (University of Nevada–Las Vegas), Alan Farahani (University of Nevada–Las Vegas) and Bethany Walker (University of Bonn)****[158]***A Paleoethnobotanical Analysis of Political Economy and Imperial Production from ca. 1300 CE Jordan*

The political economies of premodern empires often relied on a system of goods acquisition that involved local communities and nonlocal elites. For most of these polities, agricultural products were especially valuable for subsistence and symbolic reasons. This poster presents the results of the paleoethnobotanical analysis of 29 flotation samples collected at the site of Hisban, Jordan, during the 2018 field season dating to the period of 1250–1400 CE. At that time, Hisban was an administrative center in the Balqā district of the Mamluk Empire for over 300 villages. Historical sources suggest that the cultivators of the region had access to the means of agricultural production under a system known as the *iqṭā'āt*. Analysis of the flotation samples reveals that the majority of the recovered remains consisted of cereals, mainly wheat and barley, which were desired crops of the imperial elite. Comparison of these crops with nearby contemporaneous sites reveals that the villagers of Hisban at this time had access to a wider array of fruits. Therefore this research highlights the tensions between the autonomy of individual cultivators and their constraints on crop choice by imperial elites.

**Roney, John (Colinas Cultural Resource Consulting)****[95]***Cruciform Artifacts in the Southwestern United States and Northwestern Mexico*

Cruciforms are puzzling artifacts found in the southern part of the Southwestern United States and in Northwestern Mexico (SW/NW), as well as adjacent regions of northern Mesoamerica. These are small lithic artifacts with four distinct corners, often in the form of a four-pointed star or cross. They are especially interesting because they first become abundant during the Early Agricultural period, a time of greater dependence on maize agriculture, increasing sedentism, formation of larger settlements (100–200 people), and striking new evidence of collective action in the form of sophisticated ditch irrigation systems, fortified hilltop settlements (*cerros de trincheras*), and warfare. Cruciforms are part of a suite of unusual artifacts that first appear or become common at this time, artifacts that do not play any obvious direct role in subsistence, manufacture, or other utilitarian pursuits. Instead, their primary functions appear to have been in the realms of social organization and ideology. This poster is based on inspection of almost 100 cruciforms, primarily in private collections. It explores aspects of their manufacture, geographic and temporal distributions, and interpretations of their use, with implications for early connections between the SW/NW and western Mesoamerica.

**Ronsairo, Karleen (George Washington University), Whitney Goodwin (University of Missouri) and Brandi MacDonald****[220]***Preliminary Findings of the Mixteca Alta Clay Survey and Ceramic Study (MACS) in the Nochixtlán Valley of the Mixteca Alta, Oaxaca, Mexico*

This paper presents the preliminary findings of the Mixteca Alta Clay Survey and Ceramic Study (MACS) that aims to understand long-term technological change in potters' crafting techniques during the urban transition in ancient Oaxaca. The beginnings of urbanism in the Nochixtlán Valley of the Mixteca Alta span the Yucuita and Early Ramos ceramic phases (500–100 BCE) of Middle to Late Formative Oaxaca. During this period, sociopolitical relations transformed at two emerging urban centers, Yucuita and Etlatongo, situated 10 km apart in the valley. Urban transformations included increased population densities, settlement shifts to hilltop urban centers, and changes in pottery styles throughout the Mixteca. In the valley, changes in pottery styles and paste recipes at the beginning of the Early Ramos phase (ca. 300 BCE) suggest that potters in the valley began to change their crafting techniques over time within the new sociopolitical landscape. INAA and petrography were performed on Yucuita and Early Ramos phase pottery from Yucuita and Etlatongo, as well as on raw clay samples collected during MACS in the Nochixtlán Valley. The data obtained from the analyses were used to interpret long-term technological change in potters' use of the valley clays during the urban transition in ancient Oaxaca.

**Roosevelt, Anna (University of Illinois, Chicago)****[79]***Monte Alegre Paleoindians in Space and Time*

South American lowland Paleoindian peoples were quite similar in subsistence and their rock art of figural and geometric representations of humans, animals, hills, and heavenly bodies. People making triangular, stemmed points of quartz and chalcedony traversed both mainstream rivers and interfluvies. Regional distinctions developed, and Monte Alegre culture of Para, Brazil, is unique for their landscape of sandstone hills and ancient volcanic cone, varied subsistence of forest foraging and fishing, and art, which traced the sun's path through the hills and changing constellations. People sheltered in an ample rockshelter in rocky hills overlying lakes and rivers. They brought back fish and shellfish, palm fruits, berries, legume pods, and small game, especially turtles, from the lakes, streams, and forests. Under intensive use, *Attalea* and *Astrocaryum* palms formed small forests among diverse forest of tropical conifers and broad-leaf evergreens. After the sea level rose after the close of the glacial period, land-use changed to more intensive use of fish and shellfish at the expanded estuaries, swamps, and lakes. They began to use pottery to cook their food, and, with time, their settlements provided the context for domesticating the plants that supported the horticultural subsistence and elaborate pottery styles of the following Formative cultures.

**Rorabaugh, Adam (Simon Fraser University, Washington State Department of Fish and Wildlife) and Kate Shantry (Washington State University)****[28]***A Social Network Analysis of Traditional Labrets and Horizontal Relationships in the Salish Sea Region*

In the Salish Sea region, a limited amount of labrets (lip plugs) identifying particular identities are interpreted as signifying membership in horizontal relationships and achieved status for traditional cultures associated with labret wearing on the Northwest Coast of North America. Labrets are part of a shared symbolic language in the region, one which we argue facilitated access to beneficial horizontal relationships (e.g., Angelbeck and Grier 2012; Rorabaugh and Shantry 2016). We employ social network analysis (SNA) to examine labrets from 32 dated site components in the Salish Sea Region spanning between 4500 and 1500 cal BP. After this period, the more widely distributed practice of cranial modification developed in the region. SNA of labret data shows an elaboration and expansion of social networks prior to the practice of cranial modification. Social networks indicated by labret-wearing also appear to be decentralized. These findings are consistent with the practice as signifying restricted group membership based on affinal ties and achieved social status.

Rosales Hilario, Verónica [217] see Muñoz Rojas, Lizette

Rosales Lopez, Alfonso [63] see Meraz Munguia, Miriam

Roschztardt, Hannetz [74] see Vidal-Elgueta, Alejandra

**Roscoe, Paul (University of Maine)****[88]***Resilience and Vulnerability at the End of the Initial Period in Ancient Peru*

Studies of resilience and vulnerability primarily focus on the techno-organizational and economic dimensions of human experience and activity—and for good reason. Other dimensions, such as political, social, cosmological, and psychological resilience and vulnerability, are just as important to understanding the relative fragility of human systems to environmental shocks, but they are considerably less visible empirically and tractable analytically, particularly when studying the past. With these observations in mind, this paper explores the curious conjunction of demographic, cultural, and environmental changes that occurred toward the end of Peru's Initial period and the onset of its Early Horizon. Ostensibly, the civilizations of the northern and central coast declined—demographically, culturally, or both—while the highland conurbation of Chavín de Huántar and its culture spread. The paper focuses particular attention on some of the political and cosmological resiliencies and vulnerabilities that might have been involved.

**Roselli, Isabella (Hamilton College), Lacey Carpenter (Hamilton College) and Hannah Lau (Hamilton College)****[38]***The Organization and Tools of Domestic Food Preparation at the Tilcajete Sites in Oaxaca, Mexico*

I will examine food preparation tools and domestic architecture at the Tilcajete sites, located about 23 km from the city of Oaxaca in Mexico. Specifically, I will focus on the archaeology of food preparation and consumption within these unique gathering spaces. I will analyze household ceramic and lithic assemblages to reconstruct how people prepared and consumed their meals, as well as examining the practice of feasting rituals. These reconstructions provide more detailed analyses of status differences among community members, religious feasting practices, and routine food preparation activities. These reconstructions will be formed through specific analysis of food preparation technology including ceramics and stone stools. I will also employ spatial analysis to evaluate the relationship between food-related practice and domestic architecture. Comparison between households of differing status will allow me to examine the role of food preparation and consumption within everyday households versus that of a larger palace, home to those of much higher and royal status.

**Rosen, Steven (Ben-Gurion University)****[183]***Dissecting the Shrines: Exploring the Materials of Ancient Cult in the Negev*

If the rise of centralized and monumental cult practices in the Negev and neighboring southern Levantine deserts has been tied to the development of desert pastoral societies, more detailed examination of the material remains indicates that cult systems were not static, but varied over time and space. This variability is evident when cult structures, especially shrines and tumuli, are broken down into constituent components and examined for chronological and geographic variability. Thus, over the course of the Timnian Culture Complex, spanning from the mid-sixth millennium through the third millennium BCE, variability in cult architecture is evident, superimposed on basic continuities in concept and presumably practice. Specifically, continuity is reflected in the long-term use of the same sites for interment and for ritual practice, and in the use of similar architectural patterns in the shrines and tumuli. Change is reflected in chronological and geographic variability superimposed on these elements, presumably reflecting changes in ritual. These are perhaps discernible, if not necessarily fully reconstructable, for example, in the role of burial goods or in differences in structure orientations. Parsing out these changes is complex, and data are sometimes contradictory, but the idea of developing practice, and associated changing meanings, is fundamental.

**Rosenbaum, Samuel (Archaeology Southwest)****[175]***Construction and Settlement Patterns at the Gila River Farm Site*

Salado archaeology explores a unique period in American Southwestern ancient history. Beginning in the late AD 1200s northern Ancestral Pueblo groups from the Kayenta area migrated south and came into direct contact with local Hohokam and Mogollon groups. Interactions between local and Kayenta groups resulted in what we define as Salado. In New Mexico, the Salado time period is known as the Cliff phase, represented by sites such as 3-Up, Dinwiddie, and the Gila River Farm site, which has indications of occupation during much of the AD 1300s. Gila River Farm site data on bonded and abutted wall joints and varying patterns in cimiento foundation stones provides insights into different phases of construction at the pueblo. This information allows further insights into issues such as population growth, construction methods, and settlement patterns in southwest New Mexico in the AD 1300s.

**Rosenberg, Ciele (North Carolina State University), Kristrina Shuler (Auburn University) and Julie Wesp (North Carolina State University)****[69]***Fluctuating Asymmetry and the Embodiment of Maternal Stress at Newton Plantation, Barbados*

This paper examines fluctuating asymmetry (FA) in a population of enslaved individuals at Newton Plantation in Barbados to understand the mother-infant nexus through the embodiment and legacy of maternal stress. The Newton Plantation was a large-scale sugar plantation in Barbados that operated between the seventeenth and nineteenth centuries and previous historical research has shown that poor living conditions, nutritional deprivations, disease, and the stress of extreme labor impacted the quality of life for enslaved individuals. Analysis of FA can be used as a proxy of fetal developmental instability, which is directly linked to the stress experienced by the mother during pregnancy. This paper will present results based on the evaluation of bilateral metric and nonmetric skeletal and dental data for each ( $N = 35$ ) individual as well as explore trends in the population to identify any patterns related to age, sex, or other skeletal indicators of stress from previous research at the site. FA studies have been underemployed in bioarchaeological investigations, though they provide a lens that offers a salient view of the entanglement of the environmental and social realms and their manifestation into our biology. (Presentation will contain images of human remains.)

Rosencrance, Richard [94] see McDonough, Katelyn

**Rosenstein, Dana Drake (University of Arizona) and Cameron Gokee (Appalachian State University)****[186]***First Results Dating Ceramics from the Bandafassi Region, Southeastern Senegal, Using Thermoluminescence*

This study is part of a comprehensive research project investigating social and political changes effected by the Atlantic slave trade on people living in the Bandafassi region in the interior of the Senegambia. Up to now, we have dated these archaeological sites broadly to the Early Atlantic (ca. AD 1500–1800) and Late Atlantic (ca. AD 1650–1950) eras by ceramic typology and diagnostic historical artifacts. With more resolved chronological control, we will be able to better understand the shifting and adapting identities of local communities in response to the pressures of conflict with aggressive neighbors. Radiocarbon dating is not useful due to acute DeVries effects in the calibration curve over this period. Here we are presenting the first results of thermoluminescence dating on ceramic sherds from sites in the Bandafassi region. In addition, we discuss the challenges in collecting luminescence samples from shallow archaeological deposits.

**Rosenswig, Robert (University at Albany) and Douglas Kennett (University of California, Santa Barbara)****[216]***The Adaptive Mosaic of Mesoamerica's Archaic Period*

Mesoamerica's Archaic period (10,000–4000 BP) lasts longer than the Formative, Classic, Postclassic, historical, and modern periods combined. Therefore, it is at once the most important and understudied epochs and the time when maize, beans, cacao, and a host of other plants were domesticated in the region. As one of a small handful of centers of food production, these developments are of more than local significance. We synthesize research that we have undertaken together and separately from Belize, Chiapas, Guerrero, and Honduras to argue that normative categories like the "Archaic period" homogenize the adaptive variability and cultural evolutionary change evident across Mesoamerica.

**Rosenswig, Robert (University at Albany)****[216]***Chair***Rosenzweig, Melissa (Northwestern University)****[142]***Moderator***[142]***Discussant***Rospopo, Steven (San Juan College Totah Archaeological Project) and Linda Wheelbarger (San Juan College Totah Archaeological Project)****[144]***Recent Advances in the Chaco Occupation History of the LA8619 Point Great House in Northwestern New Mexico Using Comparative Ceramic Typology Analysis*

The Point Great House, LA8619, is located along the San Juan River in San Juan County, New Mexico. Ceramic analyses suggest occupation from Basketmaker II through Pueblo III time periods, approximately AD 400–1300. Local Ceramic traditions dominate the site assemblage along with Pueblo I/II Cibola Red Mesa Phase assemblages, indicating an early Chaco presence from AD 850 to 1050. The ceramic assemblage suggests a local adaptation and adoption of Chaco material traditions starting in the 980s to the early 1000s. Chaco architecture and associated P1/P2 Ceramics, coupled with an archaeomagnetic date of AD 910–1040, suggests Point Great Kiva construction between AD 1030 and 1075. Ceramic and architecture provide compelling evidence that the outlier community was a component of Chaco expansion into the Middle San Juan region before AD 1080. These analyses supplemented by lithic and perishables analyses, from multiple Totah Sites, will refine our understanding of Chaco and San Juan interaction at the Point Great House.

**Ross, Ann and Colleen Young (University of Utah)****[19]***Island Occupation Strategies Not Homogeneous: Body Size and Shape of Individuals from Eleuthera, Bahamas*

The Bahamas archipelago is composed of smaller islands in close proximity that contain a rich history of human habitation. How humans interacted and varied among the islands is poorly understood. Here, we present skeletal analyses on the body size, shape, and robusticity of Lucayans from Hatchet Bay, Eleuthera Island ( $N = 20$ ). We compared these results to nearby precolonial Bahamians ( $N = 9$ ) and diverse marine-hunter-gatherers ( $N = 250$ ). We identified that Hatchet Bay and other Lucayans have significantly higher body mass and a lower crural index than marine-hunter-gatherers worldwide ( $p < 0.05$ ). Hatchet Bay individuals exhibit a shorter stature and brachial index than Lucayans from Long Island ( $p < 0.05$ ). Additionally, individuals from Hatchet Bay are characterized by lower robusticity in the upper and lower limbs that indicate decreased mobility. Humeral midshaft shape ratios are lower than all comparative samples ( $p < 0.05$ ). Together, these results indicate that individuals from Eleuthera exhibited a body form that is short and stout and influenced by increased sedentism, suggesting that even though small (457.4 km<sup>2</sup>), Eleuthera and other islands in the Bahama archipelago contained diverse human occupation strategies.

**Rossi, Franco (Johns Hopkins University), Boris Beltrán (San Bartolo-Xultun Project) and Heather Hurst (Skidmore College; San Bartolo-Xultun Project)****[11]***The Big Move: Understanding Late Preclassic Population Decline at San Bartolo*

Similar to many sites across the Maya lowlands, a major social change happened at the end of the Preclassic at the site of San Bartolo, Guatemala. The primary occupation history of San Bartolo, Petén, Guatemala, neatly spans the Late Preclassic period with no major monumental construction at the site after ca. AD 200. However, evidence for later activities at the site, the return of people to very specific places, and the growth of new centers nearby suggest a reorganization of existing lowland communities in the second to fourth centuries AD, rather than abandonment. This paper addresses this process—summarizing previous archaeological work from the San Bartolo-Xultun region in context with recently analyzed radiocarbon dates in order to model the Late Preclassic-Early Classic period transition.

**Ross-Ibarra, Jeffrey (University of California Davis), Jorge Berny Mier y Teran (University of California) and Douglas Kennett (University of California)****[151]***Genetic Evidence of Maize and Bean Population Collapse Associated with European Contact***[WITHDRAWN]****Roth, Barbara (UNLV), Danielle Romero (UNLV) and Darrell Creel (University of Texas at Austin)****[86]***Investigating Cultural Interaction between the Mimbres and Upland Mogollon*

Despite Emil Haury's early recognition of cultural ties between the Mimbres region of southwestern New Mexico and the upland Mogollon, few current projects have examined this interaction. In this paper, we examine the relationship between these two areas with data from recent excavations at the Elk Ridge site, a Mimbres Classic period pueblo located in the northern portion of the Mimbres Valley. Using data from excavated burials, the ceramic assemblage, and pueblo rooms, we investigate the role of

intermarriage in cultural interaction between the occupants of Elk Ridge and upland Mogollon groups and the subsequent changes in material culture that occurred as a result of this interaction. We examine these changes in light of the location of Elk Ridge within the Mimbres Valley and discuss the implications these data have for examining broader interaction across the Mogollon region.

**Roth, Barbara (UNLV)**

[37]

*Discussant*

Roth, Barbara [69] see Person, Dylan

**Rothenberg, Miriam (Brown University)**

[142]

*Discussant*

Rouse, Evan [20] see York, Logan

**Routledge, Jennifer (Trent University), Christian Sonne (Arctic Research Centre), Rune Dietz (Arctic Research Centre) and Paul Szpak (Trent University)**

[28]

*Contextualizing Modern Arctic Warming through Comparison with a Past Warming Event: Stable Isotopic Evidence from Polar Bears over 4,000 Years*

Stable carbon and nitrogen isotope analysis was conducted on modern and archaeological polar bear bone from the Canadian Arctic Archipelago to investigate potential impacts of warming events on the regional food web over a 4,000-year interval. Polar bear trophic position, as reflected by  $\delta^{15}\text{N}$ , was consistent throughout the time series. Polar bear  $\delta^{13}\text{C}$  values, which can distinguish separate marine ecosystems through the relative dietary importance of primary producers at the base of the food web, were stable through the Medieval Warm period (MWP; AD 950–1250), but were significantly lower in modern relative to all ancient samples. This finding suggests that modern polar bear prey are supported to a greater extent by open-water phytoplankton, relative to ice-associated algae, than in the last 4,000 years. We suggest that, when modern data are placed within a deep time perspective they reveal that the food web structure of the Canadian Arctic Archipelago has already been impacted by anthropogenic warming.

**Rowe, Marvin (Office of Archaeological Studies), Eric Blinman (Office of Archaeological Studies), Shelby Jones (Office of Archaeological Studies) and Caroline Welte (ETH-Zurich AMS Laboratory)**

[70]

*Making the Best of a Bad Situation: Radiocarbon Dating of a Textile with Insect Damage*

Our radiocarbon sampling laboratory was asked to determine if a textile fragment was of Coptic age. The textile was a brightly colored scene with a wool weft on a linen warp. The textile had been sandwiched between sheets of acrylic, and insects had entered the space between the sheets and nibbled wool at the edges of the textile at least 15 years previous. After cleaning up the insect debris, a short piece of the linen warp was dated. The debris collected during cleaning consisted of fecal pellets, cocoon silk, and molted larval chitin. Dark-blue colored fecal pellets, assumed to reflect a diet of indigo dyed wool, were physically separated for radiocarbon analysis. Low energy oxygen plasmas produced carbon dioxide from the indigo-dyed pellets, and the carbon dioxide was radiocarbon dated at the ETH-Zürich AMS laboratory. The average of four dates obtained on the feces agrees with the date obtained on a textile linen thread ( $1345 \pm 35$  versus  $1360 \pm 70$  years BP, respectively). Within the confined space between the acrylic sheets, the larvae ingested and metabolized the indigo dyed wool without any modern contaminating carbon, so the fecal date was consistent with that of the textile.

**Rozwadowski, Andrzej (Adam Mickiewicz University)**

[146]

*Making Rock Art Contemporary: Linking the Past, Identity, and Spirituality*

In addition to application of different methods to analyze rock art images in order to understand their ancient semantic and social contexts, interdisciplinarity of rock art research also concerns the fundamental fact that the rock art is not only about the past but is also agentive element of the present. In this presentation I discuss how the ancient images are involved in the contemporary identity discourse with particular focus on the adaptations of rock art motifs in contemporary Indigenous art. Basing on the example of the Canadian First Nations artists I will address the following questions: To what extent are the images in their works exact renderings of original rock images and are they certainly such images? What factors informed the choice of particular motifs? To what extent do the meanings attributed to this art correspond with their archaeological interpretations? And finally, how does this practice fit into the narrative of restoring Indigenous spirituality?

**Rubinatto Serrano, Juliana (University of Florida), Maria Camila Vallejo-Pareja (Florida Museum of Natural History), Susan deFrance (University of Florida), Sarah Baitzel (Washington University, St. Louis) and Paul Goldstein (UC San Diego)**

[85]

*Taphonomic and Paleoecological Insights from Anurans on Tiwanaku Sites in Southern Peru*

Archaeological sites often contain animal remains that are not the direct result of human behavior. Nonetheless, these remains have the potential to serve as indicators of paleoecological conditions. We investigate the taphonomic processes that led to the deposition of anuran remains from at least three genera in five Tiwanaku archaeological sites in the Moquegua Valley, Peru (700–1100 CE).

Anuran bones are most common in below-ground rock-covered tombs in cemeteries when compared to habitational and ceremonial contexts. Despite this difference, the quantity of anuran remains in all five sites is anomalous for other Moquegua Valley sites and Tiwanaku sites in other settings. We consider environmental, cultural, and taphonomic explanations, and suggest that the archaeological anurans are evidence of owl predation that occurred after Tiwanaku inhabitants abandoned the sites. Modern observations of Burrowing Owl (*Athene cunicularia*) nesting behavior corroborate our interpretation. We further hypothesize that the abundance of anuran remains relates to the fourteenth-century El Niño Miraflores event, which generated increased rainfall in the desert and created conditions favorable for frog and toad proliferation. We also advocate for the greater use of fine-screening to recover small-sized animal remains, as anurans, which can be used to better understand taphonomic processes and paleoenvironmental conditions.

Ruby, Bret [196] see Everhart, Timothy

**Rucinski, Hannah (Illinois State Archaeological Survey) and Georgia Abrams (Illinois State Archaeological Survey)**  
[159]

*Public Archaeology in the Mirror: An Updated Model at the Illinois State Archaeological Survey*

The structural components of public engagement in archaeology have universally shifted in the previous two years. Changes in outreach at the Illinois State Archaeological Survey (ISAS) began long before the onset of the pandemic as a result of stakeholder consideration and funding reallocation through the Prairie Research Institute. This self-reflective six-month project resulted in a Standard Operating Procedures (SOP) binder for future public outreach events and activities at the ISAS Central Offices. It includes an updated model for measuring the results of public engagement with consideration for qualitative data, which had not previously been considered. The SOP binder's contents can be implemented and adapted to successfully obtain necessary information on sharing archaeology with the public regardless of change on the institutional or universal levels.

**Rucker, Teresa (Office of the State Archaeologist, University of Iowa)**  
[114]

*Iowa's Groundbreaking Archival Program: Building Digital Capacity for Midcontinent Archaeological Research*

The University of Iowa Office of the State Archaeologist (OSA) holds one of the largest archaeological and anthropological databases in the midcontinent. Numerous grant awards have enabled OSA's digitization of over 100,000 photographs, 100,000 reports, and 470,000 pages of associated documents, all pertaining to Iowa archaeology. In addition, the OSA has extensive archival resources on the archaeology of other midcontinental states. These resources support researchers, archaeological consultants, and state and federal agencies complying with historic preservation laws, including the Iowa Department of Transportation, the Iowa Department of Natural Resources, and the US Army Corps of Engineers.

**Ruiz, Judith (Instituto de Investigaciones Antropológicas UNAM) and Yamile Lira**  
[209]

*Afinidad biológica y prácticas mortuorias en Centro de Veracruz: Maltrata y Barriales de las Besanas*

La región cultural de Veracruz se caracterizó por una dinámica poblacional fluctuante e interacciones culturales a lo largo de su proceso histórico con otras regiones de Mesoamérica. Es posible que tales acontecimientos se reflejen en las historias de vida de las personas que experimentaron los cambios políticos e ideológicos, es decir, la forma en que fue tratado su cuerpo y que se materializa en las prácticas mortuorias, las cuales son de diversa índole. Se ha puesto poca atención a los tratamientos mortuorios con posibles depósitos no funerarios que dan cuenta de violencia ritual en una región cultural con gran interacción para Mesoamérica. El objetivo de esta presentación es contribuir al conocimiento del tratamiento corporal de varios entierros catalogados como secundarios como parte de prácticas ceremoniales al documentar desmembramiento en estos; así como entierros funerarios, corresponden al periodo Preclásico, Clásico, Posclásico y colonial. Se pretenden aplicar diversas metodologías de estudio como la tafonomía, la arqueotanatología y la morfología dental, con ello brindar respuestas sobre las circunstancias de muerte, el tratamiento del cuerpo y la afinidad biológica.

**Ruiz Menjivar, David (University of Florida), Michaela Zewdu Tizazu (University of Florida) and Steven Brandt (University of Florida)**  
[90]

*Morphometric and Technological Analyses of Late Pleistocene and Early Holocene Lithic Assemblages from Guli Waabayo Southern Somalia*

For decades archaeological research in Somalia remained stagnant due to political instability. However, refined dating methods and renewed studies of curated archaeological assemblages from excavated open-air and rockshelter sites in southern Somalia have pushed back human occupation from <10 ka to ~30 ka. This has allowed archaeologists to re-consider how hunter-gatherer populations coped with paleo-ecological changes that characterized the shift from the arid conditions of Marine Isotope Stage (MIS) 2 (~29–14.5 ka) to the African Humid period of early MIS1 (~14.5–5 ka). Here we focus on recent technological and 3D morphometric analyses of lithic assemblages from the Late Pleistocene/Early Holocene deposits of Guli Wabaayo (GW) rockshelter, Buur Heybe, southern Somalia to help test a long-standing ecological model that predicts changes in lithic technology and morphology as proxies for changes in the mobility and subsistence strategies of hunter-gatherers responding to fluctuations in the availability of key resources. As predicted, MIS2 assemblages reflect a more mobile foraging system characterized by planimetric flake/blade core reduction strategies and distinctive pressure-flaked, unifacial/bifacial/trifacial pointed tools made on thermally altered exotic toolstones, compared to MIS1 assemblages that suggest more sedentary strategies: opportunistic reduction strategies, local toolstone use, earliest grindstones and absence of highly stylistic tools.

Ruiz Menjivar, David [186] see Brandt, Steven

Rumiche, Francisco [88] see Mauricio, Ana

**Russ, Jon (Rhodes College), Logan Rayburn (Rhodes College), Sarah Ginsburg (Rhodes College), Asya Bray (Rhodes College) and Francisco Nuñez-Parker (Rhodes College)**

[39]

*Atmospheric Aerosols as a Source of Oxalate in Rock Coatings Covering Rock Art in the Lower Pecos Canyonlands*

The vast majority of prehistoric rock paintings that occur in dry rockshelters are covered with a natural calcium oxalate-rich rock coating. It is likely that the coatings preserve the ancient rock art by fixing the mineral pigments to the rock substrate and preventing surface erosion. Moreover, radiocarbon ages of oxalate coatings have become the primary method to establish chronologies of the artifacts. How the rock coatings form remains uncertain, although microbial activity on the rock surfaces is generally the accepted mechanism. Here we report results of gas chromatograph–mass spectrometry analyses of rock coating samples from 10 sites in the Lower Pecos Canyonlands of southwestern Texas. These results provide evidence that a source of the oxalate on the rock surfaces is oxalic acid dissolved in atmospheric aerosols. Oxalic acid, the shortest dicarboxylic acid (DCA), is the predominant organic compound in atmospheric aerosols. Secondary constituents are comprised of other short chain DCAs (C3-C9). Our analyses show that all 10 samples contained a suite of short chain DCAs, which is compelling evidence that at least some of the oxalates coatings in the region are the result of reactions of atmospheric aerosols with calcium on the rock surfaces.

**Russell, Bradley (University at Albany–SUNY)**

[225]

*Ritual Termination of Polished Stone Ornaments in New York*

Hartgen Archeological Associates conducted a three-phase investigation at the proposed site of a public housing complex in the Town of Herkimer, Herkimer County, New York, between 2018 and 2020. The work resulted in the identification of the HHA-1 Precontact Site (USN 04341.000157), a temporary camp dating to the transition from the Early to Middle Woodland periods which contained a fire-cracked rock cooking platform and associated scatter of lithic debitage. Among the artifacts recovered was an intentionally broken fragment of a shale gorget with several distinct sets of irregular incising suggesting that it was ritually terminated. Investigation of the piece led to more comprehensive analysis of stone gorgets contained in the collections of the New York State Museum. This paper presents the findings of that investigation, including information about stone gorget production, decoration, recycling, ritual termination, and curation based on examples collected from diverse locations around the state of New York.

Russell, James [116] see Perrotti, Angelina

**Rutecki, Dawn (Grand Valley State University)**

[179]

*Navigating Communities: Ethical Considerations of Archaeological Collaborations*

Disciplinarily, archaeology increasingly emphasizes community collaborations in conducting research. Significant work exists on how to engage communities ethically and steps that can be used to build mutually reciprocal collaborative relations. Key to these discussions is how to engage with stakeholders that have distinct needs to find a balance. More difficult is when there is no theoretical or practical commonality of stakeholders at the location of research. When interest in archaeological research exists without contestation, but is at risk of becoming embedded in contradicting local interests, how does this impact investigating archaeological contexts? If different community positions are seemingly intractable, what are the alternatives to conducting archaeological research? This paper considers the ethical implications of contested collaborations when conducting archaeological research in the United States to discuss how recent cultural politicization affects engaging in potential research.

**Rutecki, Dawn (Grand Valley State University)**

[165]

*Moderator*

**Rutherford, Cady (University of Texas at San Antonio), Marisol Cortes-Rincon (Humboldt State University) and Jonathan Roldan (University of Nevada–Las Vegas)**

[96]

*Relationships of Production in Maya Households*

Economic integration in small communities has often been undertheorized in Maya studies. Here I explore the evidence of craft production and spatial relationships in several residential groups as well as the implications for connections with social, political, and economic institutions. These groups make decisions about crafting activities and respond to risks and stressors, both environmental and political. The residential groups explored in this study are located in northwestern Belize on the outskirts of Dos Hombres and were engaged in a number of different crafting activities. By exploring these household processes, we can gain an improved understanding of the various pressures at play. Understanding households as an integrated part of the larger society allows us to better understand the decision-making happening at the household level as well as the larger processes that influence these households and are influenced by them.

Rutherford, Cady [210] see Levi, Laura

Ruvalcaba Sil, José Luis [59] see Ejarque Gallardo, Ángela

**Ryan, Susan (Crow Canyon Archaeological Center) and Rebecca Hammond (Crow Canyon Archaeological Center)**  
[152]

*Indigenous Perspectives on the Future of Chaco Research*

Archaeological research focused on Chaco Canyon and Chaco outliers has been ongoing since the 1800s. One defining aspect of this work is that research questions, methods, and interpretations have been primarily constructed by non-Indigenous academics. In an effort to conduct research with people, rather than on them (Heron 1996; Reason 1988), we offer a collaborative approach to directing future Chaco studies. The work presented in this paper is grounded in participatory action research and collaborative inquiry and engages Indigenous co-inquirers in the process of developing research questions that will be of benefit to Indigenous people and guide our discipline toward a more holistic perspective on what constitutes valid inquiries and the creation of cultural knowledge.

**Safronov, Alexander (Lomonosov Moscow State University), Dmitri Beliaev (Russian State University for the Humanities) and Milan Kovac (Comenius University, Bratislava, Slovakia)**

[62]

*Reestablishing the Kingdom: Uaxactun in the Beginning of the Early Classic*

The results of Uaxactun Regional Archaeological Project (PARU) demonstrate that site was the center of major Maya polity at least since the early Late Preclassic. Evidence of the dynastic activity at Uaxactun includes carved monuments with hieroglyphic inscriptions (Stela 28) and inscribed royal insignia like a stone perforator discovered in the offering under Structure H-XVI. Stela 10 preserved fragments of a possible Late Preclassic Long Count date. Between AD 100 and 150 Uaxactun collapsed and monumental core of the site was abandoned until Tzakol 1 phase (AD 250–300). Reanalysis of the corpus of Early Classic hieroglyphic inscriptions demonstrated that the restoration of the dynasty took place ca. AD 300 during Tzakol 2 phase. Stela 9 mentions the accession of the local king in AD 323, and at the same time royal burials appear in Groups E and A. Stelae 18 and 19 (AD 357) were erected by king Tz'akbu Usij who acceded in AD 356. The Tzakol 2 apogee was interrupted between AD 370 and 375 when Tz'akbu Usij was probably captured by Chak Tok Ich'aak II of Tikal. We believe that this conflict was one of the key moments in the creation of Tikal hegemony shortly before Teotihuacan entrada in AD 378.

**Safronov, Alexander (Lomonosov Moscow State University)**

[62]

*Chair*

**Sakai, Sachiko (California State University Long Beach)**

[208]

*Examination of the Site History in the "Zip Code Site," a Large Puebloan Site at Mt. Trumbull Area in the Arizona Strip*

The first excavation study of the Virgin Puebloan structures at Mt. Trumbull was recently conducted in the Arizona Strip. The goal of this study is to gain a better understanding of the settlement patterns and adaptive strategies among the small-scale farmers who lived in this marginal environment. The Zip Code site (131BLM) chosen for this project is a large site with multiple pueblo structures that are at least 200 m long. One hypothesis proposes that all rooms were used during the same time, which may represent an aggregation of smaller pueblos. Previous studies suggest a very small number of corrugated sherds, which implies that this site was occupied during the late Basketmaker III or Pueblo I period. The radiocarbon dates and optically stimulated luminescence (OSL) dates from surface and midden, however, range from AD 476 to 1350, beyond the Pueblo I period. Thus, it is also hypothesized that this large site is a result of long-term occupation where not all structures/rooms were used simultaneously. Several rooms were excavated to understand the history of the site's use. In this paper, I will present the results of OSL dates from several rooms to investigate the history of occupation.

**Salame, María (Universidad Mayor de San Andrés), José Capriles (Pennsylvania State University) and Sergio Calla Maldonado (Universidad Mayor de San Andrés)**

[122]

*Settlement Patterns and Social Change among the Pacajes Pastoralists of the Andean Altiplano*

Ethnohistoric resources document that the Andean highlands around Lake Titicaca held some of the most politically influential polities at the time of the Spanish conquest in the sixteenth century. To the southeast, the Pacajes, was an agropastoralist polity, which had as one of its capital, the town of Caquiaviri. Previous archaeological research carried in Caquiaviri and neighboring regions emphasized the abundant Late Intermediate and Inca period related burial towers and fortified sites. Nevertheless, a broader understanding of regional and temporal settlement patterns and their change in relation to socio-environmental variability remains largely undetermined. In this paper, we rely on data collected from a high-intensity full coverage regional pedestrian survey of 109 km<sup>2</sup> around Caquiaviri to reconstruct the evolution of settlement patterns over time. Our results include the documentation of 111 sites and dozens of non-archaeological features that together emphasize the importance that resource accessibility, long-term reliance on domesticated herds of camelids, and territoriality had over time. Settlements of various sizes and complexity were mostly distributed around permanent wetlands and seasonally active rivers that consisted of the best pastures. Over time, population dynamics seems to have fluctuated in relation to securing such resources modulated by changes in environmental productivity.

Salazar, Lucy [74] see Burger, Richard

**Salazar Chávez, Victor (George Washington University) and Jeffrey Blomster (George Washington University)****[201]***It IS Agriculture: Highland Perspectives on Maize Agriculture before 1000 cal BCE*

Scholars interested in Early Formative subsistence have recently questioned the role maize played in the development of sociopolitical complexity in Mesoamerica. Revisionists regard maize cultivation as a complementary activity to what would now be seen as complex horticultural societies, beginning with the Mokaya in the Pacific coast and including the Gulf Olmecs of San Lorenzo. The date of 1000 cal BCE, the transition from the Early to Middle Formative, has been proposed as the new threshold when "true" agricultural societies begin to appear in Mesoamerica. Although posing challenging ideas, nonagricultural models have focused on the study of lowland societies, which we argue are insufficient to explain a phenomenon as broad and diverse as maize farming in contemporaneous societies located in different environmental settings. In this paper, we present the analysis of the largest macrobotanical assemblage for Early Formative Mesoamerica, recovered from the regional center of Etlatongo in the Mixteca Alta of Oaxaca, dating to 1400–1000 cal BCE. Our results differ significantly from lowland-based models. Full-blown maize agriculture and maize-based diets did occur in the highlands as early as the fourteenth century BCE, suggesting maize played a more dynamic role in the constitution of socioeconomic and political relationships in Mesoamerica.

**Salazar Chávez, Victor (George Washington University)****[201]***Chair*

Salazar Chávez, Victor [220] see Blomster, Jeffrey

**Saldana, Melanie (California State University, Los Angeles) and James Brady (California State University, Los Angeles)****[170]***Quarantined but Not Helpless: Teaching Archaeology during the Pandemic*

During the 18 months since the COVID lockdown began, archaeology at California State University, Los Angeles, has struggled to address the pitfalls of Zoom classroom teaching: distance, impersonalism, and the loss of the field component of our program. How do we keep a program afloat that depends so heavily on fieldwork for teaching and maintaining the program's social fabric? How do we create a dynamic learning environment for students no matter the limitations? Like many, we have rethought our curriculum and changed our teaching practices to address the most serious drawbacks of remote instruction. Additionally, we have taken advantage of opportunities presented by remote learning to bring the field to students. This paper will chronicle our journey as we promote student research and presentations, utilize team teaching as a tool, and prepare students for their futures during the pandemic.

**Saldana, Melanie (California State University Los Angeles)****[70]***Chair*

Salgado González, Silvia [125] see López Rojas, María

**Sall, Candace (University of Missouri Museum of Anthropology and American Archaeology Division)****[180]***Discussant***Sallum, Marianne (University of São Paulo) and Francisco Silva Noelli (University of Lisbon)****[35]***The Pots and the Senses in the Communities of Agroforestry Practices from Southeast São Paulo, Brazil*

The Paulistaware was produced and preserved by women for five centuries, as a significant option for transmitting knowledge and autonomy. It is a manifestation created and transformed by women who connected knowledge and ontologies from different times and places. The elements for its definition are presented to investigate morphology and function, in order to establish metric parameters for graphical reconstruction of the profile from fragments of ceramic vessels. The attributes of 73 whole and semi whole pots were analyzed. Our conclusion is that most of the pots found in southeastern São Paulo and northeast Paraná are not copies, but indeed morphological variations of a restricted ellipsoidal shape. Both the morphology and surface treatments suggest that São Paulo Ceramic resulted from the appropriation and transformation of common Portuguese ceramic technologies by the Tupiniquim women and, later, by other people, continuously articulating elements and giving new meaning to their practices, which allowed their persistence to present days.

Salomon, Hélène [155] see Chanteraud, Claire

**Saltini Semerari, Giulia (University of Michigan)****[226]***E pluribus unum: Multidisciplinary Approaches to Ethnogenesis during the Greek Colonization of Southern Italy*

The study of the Greek colonization in the eighth- to seventh-century BC Mediterranean, which cast migrants from the Aegean to the coasts of the Black Sea, Italy, France, and Spain, has been shaped by shifting interpretative paradigms of culture contact dynamics. In the last three decades, traditional, essentialist narratives about territorial occupation and displacement of local communities have begun to give way to more nuanced interpretations integrating ideas about middle ground, hybridity, and locality. Yet, these

changing perspectives have accentuated tensions between increasingly rarefied theory and their potential application to archaeological data on the ground. In this paper, I illustrate the potential of multidisciplinary, analytical approaches to an exceptionally well-preserved site in southern Italy, Incoronata (Basilicata). There, a nearly two-decade-long research project has uncovered a cohesive sequence of monumental structures, votive deposits, and workshops, as well as extensive evidence of Greek-local coexistence within the same space. Combined with biodistance and isotopic analyses of skeletal remains in the region, these data shed light on dynamics of migration, interaction, and culture contact that spanned three centuries and brought about a drastic change in the social, economic and political identity of the region.

**Samuelsen, John (Arkansas Archeological Survey / University of Arkansas)**

[30]

*A Test of Trace Element Analysis for Detecting Pb and Sr Contamination in Ancient Human Tooth Enamel*

Trace element analysis evaluated soil Pb/Sr contamination of ancient human teeth at the Crenshaw site in southwest Arkansas. Crenshaw is multiple-mound Caddo ceremonial center with a skull-and-mandible cemetery dating between AD 1253 and 1399. Evaluating diagenetic contamination of Pb in tooth enamel is of particular importance to the continuing use of the Pb isotopic technique for studies of ancient human geographic origins. Previous studies have used trace element analysis to detect contamination of ancient human tooth enamel. The effectiveness of the method is evaluated and three potential issues are discussed: (1) problems with comparisons between ancient indigenous and modern human tooth enamel, (2) lack of clarity as to which elements are useful for detecting Pb contamination, (3) potential interregional variability of concentrations of some elements in human tooth enamel. Correlation analysis and comparisons to burial soil trace elements suggest that this population had greater in-vivo exposure to rare earth elements and vanadium than modern populations. The trace element analysis was largely successful at assessing contamination and is recommended for future studies, but some elements and universal thresholds may not be useful for ancient populations in different areas.

**Sanchez, Carleen (Austin Community College)**

[10]

*Mimesis and Alterity on the Borderlands: Making Sense of Cultural Practices in the Southeast Maya Periphery*

This paper will focus on the borderlands between the Late Classic period Maya city of Copan and its relationships to contemporary sites to the west and south. This was a highly dynamic area of brisk interregional exchange where ideas as well as people moved from one point to another across the "fuzzy" border between Mayan and non-Maya peoples. Specific reference will be made to the site of La Union located 35 km from Copan. Remarkable similarities in monumental architectural style, including a central temple and ballcourt with macaw head markers, relate La Union directly to Copan. However, the site had ancestral roots in a pre-Mayan tradition some of which persisted through the Late Classic period. Invoking the concepts of mimesis and alterity utilized by anthropologist Michael Taussig, I will examine the strategic practices that may have influenced elite inhabitants of La Union to display affinity with Mayan Copan through salient symbolic emblems (mimesis). Yet, alterity is also evident in the region which may have been a strategy for populations to resist Mayan hegemony through the assertion of ancient traditions in place prior to the expansion of the Maya into the Southeast Maya periphery.

**Sanchez, Gabriel (Michigan State University), Michael Grone (Amah Mutsun Land Trust) and Alexii Sigona**

[141]

*Centering Indigenous Foodways, Culture, and Stewardship: Perspectives from the Amah Mutsun Tribal Band*

Since time immemorial, the Amah Mutsun Tribal Band (AMTB) has stewarded terrestrial and aquatic resources in central California. Evidence from archaeology, ethnographic, and ethnohistorical records demonstrate long-term Indigenous stewardship through Indigenous fire management strategies and selective harvesting of plants and animals. Spanish, Mexican, and American colonialism in California sought to erode Amah Mutsun cultural practices and relationships to land through land dispossession and banishment of traditional stewardship practices. Current legal, social, economic, and political processes reinforce these colonial legacies. As a non-federally recognized and landless tribe, access to cultural resources, including traditional foods, has been affected. Without formal acknowledgment of tribal sovereignty by the government, food sovereignty efforts have been stymied. Through several collaborative projects, the AMTB is regaining Indigenous knowledge, reclaiming their sovereignty, and stewarding traditional lands. These collaborations have been integral for rebuilding foodways and food sovereignty by cultivating non-domesticated plant and animal foods following traditional stewardship methods. Our synthesis outlines how the AMTB, through the Amah Mutsun Land Trust, is revitalizing Indigenous stewardship of landscapes and seascapes, which has precipitated a greater abundance of cultural foods, increased access to ancestral lands, and Indigenous knowledge important for rebuilding traditional foodways, thereby working toward food sovereignty.

Sanchez, Gabriel [131] see Apodaca, Alec

Sánchez, Guadalupe [86] see Carpenter, John

Sánchez, Guadalupe [176] see Davidson, Jaron

Sánchez, Guadalupe [176] see Krug, Andrew

Sánchez, Guadalupe [176] see Larrick, Dakota

Sánchez, Guadalupe [176] see López Rivera, José Antonio

Sánchez, Guadalupe [176] see Pailles, Matthew

Sanchez-Borjas, Angel [74] see Mesia-Montenegro, Christian

Sandgathe, Dennis [60] see McPherron, Shannon

**Sandweiss, Daniel (University of Maine)**

[151]

*What the Shells Tell: Interdisciplinary Malacoarchaeology and Holocene Paleoclimate in Coastal Peru*

[WITHDRAWN]

**Sandweiss, Daniel (University of Maine)**

[216]

*The Central Andean Coastal Archaic?*

Some archaeologists working in the Central Andes use the term “Archaic,” though it is unclear exactly how to apply Willey-Phillips’ definition (a stage of reduced mobility and intensified resource procurement before the advent of agriculture) along the coastal plain. Specialized, intensive fishing dates from the Terminal Pleistocene, but at least some fishing sites were seasonal. Should the Archaic begin with these earliest sites? Domesticated plants appear by the start of the Holocene, but are not accompanied by ceramics or obvious indicators of sedentism. Small-scale monumental architecture is present by 7000 cal BP and large monuments start between 5000 and 6000 cal BP. The earliest canals date to about 5000 cal BP and shortly thereafter large-scale irrigation is necessary to explain the amount of crops and the size of sites, at least in the Norte Chico area north of Lima, Peru—sites that have all the hallmarks of sedentism although the economy was based on a combination of fishing and farming. And yet pottery does not occur south of modern Ecuador until after ~3600 cal BP. There is also considerable latitudinal variation in the record. Here, I consider this record in assessing the utility of the Archaic concept for the region.

**Sandweiss, Daniel (University of Maine)**

[47]

*Discussant*

[88]

*Chair*

Sandweiss, Daniel [88] see Kelley, Alice

Sandweiss, Daniel [88] see Landazuri, Heather

Sandweiss, Daniel [88] see Mauricio, Ana

Sandweiss, Daniel [129] see Rademaker, Kurt

Sanger, Matthew [79] see Garland, Carey

Sanhueza, Lorena [18] see Ramírez Funes, Horacio

Sano, Katsuhiro [120] see Izuho, Masami

**Santana Quispe, Lady (Universidad Nacional Mayor de San Marcos), David Beresford-Jones (McDonald Institute for Archaeological Research), Lauren Cadwallader (McDonald Institute for Archaeological Research) and Susana Arce Torres (Museo Regional de Ica)**

[189]

*El tránsito del periodo Horizonte Medio al Intermedio Tardío en Samaca, Valle Bajo*

El tránsito del periodo Horizonte Medio (PHM) al Intermedio Tardío (PIT) en los Andes centrales, es un proceso que carece de claridad y ha generado un sinnúmero de preguntas y distintas respuestas. En particular, información proveniente de los valles del sur de Ica (Palpa y Nasca) advierten de la existencia de un proceso caracterizado por la ausencia de material que represente el tránsito del Horizonte Medio al Intermedio Tardío. Por el contrario, trabajos de excavación en la cuenca de Samaca, brindan información sobre la persistencia de cerámica de la época 4 del Horizonte Medio, sin que se verifique algún tipo de hiato o silencio arqueológico. Esta presentación tiene como objetivo formular y proponer que; la correlación entre fechados absolutos, relativos y la secuencia estratigráfica de la Unidad 3 del sector C del sitio arqueológico Samaca expresaría que, entre la población que habitaba Samaca, continúa circulando cerámica del PHM (Época 4). Asimismo, refleja que, una parte del sitio fue ocupado a partir de la última época del PHM (Época 4) o en los albores del PIT.

**Santana Sagredo, Francisca (Pontificia Universidad Católica de Chile), Andrea Czermak (University of Oxford), Julia Lee-Thorp (University of Oxford), Rick Schulting (University of Oxford) and Mauricio Uribe (Universidad de Chile)**

[29]

*The Life, Journeys, and Traumas of the Slingshot Woman: A Case Study from the Pica 8 Cemetery, Atacama Desert (Northern Chile)*

Here we present the case of a woman, known as B0240, who died at an estimated age of 25–30 years old and was buried in the Pica 8 cemetery during the Late Intermediate period (LIP; AD 900–1450) in northern Chile’s Atacama Desert. She had suffered three serious antemortem injuries—a broken scaphoid, clavicle, and pelvis (ischium)—from which partial recovery is visible. Her burial offerings are distinct from those of others in the Pica 8 cemetery, including a slingshot and a distinctly nonlocal bag, or *chuspa*. We set out to characterize and reconstruct the life history of this woman from a bioanthropological and multi-isotopic ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ,  $\delta^{18}\text{O}$ , and  $^{87}\text{Sr}/^{86}\text{Sr}$ ) perspective using tooth, bone, and hair samples and to consider the results within the archaeological

context. The isotopic data for teeth and bone match well with residence in the Andean altiplano, consuming a terrestrial C<sub>3</sub>-based diet. Her move to Pica resulted in a sudden shift toward a C<sub>4</sub>-based diet visible in her hair during the final months of life. The results show the level of detail about an individual's life history that is possible when applying a bioarchaeological approach to understanding mobility and life history in northern Chile.

Santiago, Louis [96] see Fedick, Scott

**Santiago, Tiffany, Katherine Miller Wolf and Rebecca Storey**

[91]

*Paleopathology of Migrants to Ancient Copan during the Late Classic*

Variation in radiogenic strontium isotopic ratios (<sup>87</sup>Sr/<sup>86</sup>Sr) allows for mobility and migration to be tracked across geographic areas and demographic categories like age, sex, and status. A considerable amount of migration has been documented among ancient Maya populations. This research examines 115 Late Classic (AD 600–822) individuals from Copan, Honduras, to compare skeletal paleopathological data with strontium isotope data to evaluate any potential differences between migrants and non-migrants. The data are situated within a cultural theoretical framework inspired by translocalism, which looks at the connection people have to different localities.

Santoro, Calogero [120] see Capriles, José

Santoro, Calogero [10] see Tripcevich, Nicholas

Sarig, Rachel [191] see May, Hila

Sarris, Apostolos [147] see Mehmetaj, Haxhi

Sarris, Apostolos [2] see Riebe, Danielle

**Sassaman, Kenneth (University of Florida)**

[216]

*The End Is Not Near: An Archaic World-Renewal Perspective on Our Own Future*

If measured by the grandeur of Poverty Point, the Archaic period in the American Southeast went out with a bang. In the centuries leading up to its abandonment, Poverty Point was the locus of world renewal that united communities across much of the region. This network of persons was structured by places of cosmological import and the pathways that connected them. Although human access to places of this sacred geography (e.g., mounds, caches, cemeteries) became difficult as climate grew increasingly unpredictable, the extant network of persons afforded opportunities for displacement, relocation, and reorientation to become what archaeologists describe as the Early Woodland. Through the lens of world renewal, what appears to be the end is just another beginning, one predicated on reconciliation between the space of experience and the horizon of expectation. From this history come useful insights on our own future of population displacement and resettlement.

**Sasso, Robert (University of Wisconsin–Parkside) and Daniel Joyce (University of Wisconsin–Parkside / Kenosha Public Museum)**

[66]

*The Archaeology of an Avocational Archaeology Project: The Montgomery Site 1975–1977 Kenosha County Archaeological Society Excavations Revisited*

The Montgomery Site is the location of an 1834 log cabin that represents the first historically recorded Euro-American structure within what is now Kenosha County in southeastern Wisconsin. Between 1975 and 1977, the Kenosha County Archaeological Society conducted avocational excavations of the original cabin location as part of a county-funded bicentennial research project. Between 2013 and the present, the University of Wisconsin–Parkside and Kenosha Public Museum have collaborated on professional archaeological field research at the site. Combined with the thorough examination of available records from the 1970s project, this recent research has yielded important information regarding the nature of the earlier work and its previously unreported findings. It also has produced artifactual remains that provide interesting insights into the various activities that occurred while the KCAS fieldwork was underway. This rare opportunity to learn a great deal about a past project through systematic archaeological field research has enhanced our understanding about that project as well as about the nature of the site and its historic archaeological contexts.

**Sattler, Robert, Robert Bowman (Northern Land Use Research), Michael Grooms (University of New Mexico), Carrin Halfman (University of Alaska, Fairbanks) and Joshua Reuther (University of Alaska, Fairbanks)**

[31]

*Rampart Canyon: Dated Components in the Middle Reach of the Yukon River, Alaska*

Rampart Canyon is a bedrock constrained corridor between broad lowlands along the middle reach of the Yukon River basin in central Alaska. The river breach is a focal zone for the migrations of Pacific salmon to their spawning grounds in the headwaters of the Yukon River drainage. Froehlich Rainey's survey of the region in the 1930s has recently been supplemented with subsurface testing at the Rampart Dune site, the initial precontact site to be systematically tested in the Rampart Canyon. The site is a series of ground pits spread across an elevated, relict dune field adjacent to the main channel of the river. Multiple pit features of varying

sizes and shapes traverse several vegetated sand ridges. Ground-penetrating radar imagery has guided data recovery of well-preserved birchbark and chum salmon remains in the largest pit feature (ca. 1400–650 cal BP). Buried components in adjacent eolian deposits date to 1150 cal BP and 10,300 cal BP. The Rampart Dune locality is the only known multicomponent site in the middle reach of the Yukon River.

Saul, Julie [91] see Godhardt, Ava

Saul, Tiffany [169] see Wadford, Tabatha

Saumur, Jennifer [35] see Davila, Carol

Saunders, C. Matthew [159] see Lamoureux-St-Hilaire, Maxime

Savage, Sheila [65] see Hammerstedt, Scott

Savarese, Michael [127] see Kangas, Rachael

Sawchuk, Elizabeth [26] see Cerezo-Román, Jessica

Sayle, Kerry [30] see Hamilton, Derek

**Sayre, Matthew (High Point University)**

[89]

*Galleries, Processions, and How the Mind Moves with Sacred Plants*

The Formative period site of Chavin de Huántar, Peru, is known for its elaborate iconography and complex gallery chambers constructed behind the temple walls. Several of the sculptural elements at the temple provide visual evidence for the consumption of sacred plants. These include plaques, tenon heads, and possibly the Lanzon. In this paper, I present new ideas on how particular sacred plants, such as Vilca (*Anadenanthera colubrina*) and Wachuma (*Echinopsis pachanoi*) may have altered pilgrims' perceptions of time and space as they gathered outside and inside the temple. Additionally, I present new interpretations of how the Lanzon may have been read by pilgrims when they encountered this massive monolith within its chamber. Finally, there is discussion of the broader implications of these practices in the Formative period Andes.

**Scaffidi, Beth (University of California, Merced), Elise Alonzi (Center for Bioarchaeological Research), Ian Armit (University of York), Penny Bickle (University of York) and Elena Isayev (University of Exeter)**

[157]

*Beyond the Local/Nonlocal Dichotomy: Case Studies in Contextualizing Archaeological Strontium Isotope Studies*

Now in its "golden age,"  $^{87}\text{Sr}/^{86}\text{Sr}$  analysis provides the clearest evidence of first-generation immigration in the (bio)archaeological record. Yet, as techniques advance, strontium isotope studies remain limited largely to identifying nonlocals, distanced from grand and mid-level theory, and often disassociated from non-isotopic datasets that could mutually inform isotopic questions of residential and dietary change. We review strontium isotope studies from known immigration centers and outlying origin sites (from the Old and New World) to compare  $^{87}\text{Sr}/^{86}\text{Sr}$  ranges between and within individuals (where available) and between sites in these study regions relative to global and locally parameterized  $^{87}\text{Sr}/^{86}\text{Sr}$  baselines to explore how local archaeological  $^{87}\text{Sr}/^{86}\text{Sr}$  variability might best be characterized. Next, we compare these compiled datasets, the nature of questions asked and answered, and the public availability of other relevant datasets which could offer insights into those questions and new, more theoretically situated ones, grounded in synthesizing multiple variables and approaches. We also compare analytical metadata, including the year of publication, disciplines of co-authors, laboratories used, preparation and mass spectroscopy methods utilized, instrumentation, diagenesis checks, standards analyzed, and ethics statements to pinpoint areas for future study and refinement as strontium isotope studies proliferate and become accessible to more researchers around the globe.

**Scaffidi, Beth (University of California, Merced)**

[157]

*Chair*

Scarborough, Vernon [48] see Lentz, David

**Schach, Emily (University of California, Santa Cruz) and Jane Buikstra (Arizona State University)****[217]***Feeding the Dead at Chiribaya Alta: A Comparative Analysis of Mortuary Practices*

Andean mortuary practices reflect aspects of individual and cultural identities as well as broader attitudes toward the dead. Multiple studies at Chiribaya Alta have identified various social identities possessed by the dead. Few, however, have addressed the broader cultural practices and attitudes toward the dead reflected in Chiribaya Alta mortuary contexts and their relationship to other Late Intermediate period groups within the Moquegua Valley. The inclusion of foods and eating utensils within graves at Chiribaya Alta suggests that the practice of "feeding the dead" was an important element to funerary rites. In this paper, we examine the presence of eating implements and foods within graves at Chiribaya Alta ( $n = 307$ ) to consider their potential symbolic meanings within funerary practices. A comparison of food-related mortuary practices between Chiribaya and other LIP groups in the Moquegua drainage will be used to understand relationships during this time period. Thus, this study will allow for a consideration of the multiple ways in which the act of feeding the dead fulfills the mourner's obligations to the dead, social identities at Chiribaya Alta, and relationships between archaeologically identified LIP cultures.

Schach, Emily [162] see Witte, Emilee

Schaefer, Johnny [66] see Turney, Kathryn

**Schaefer, Jordan (University of Tennessee, Knoxville), Jan Simek (University of Tennessee, Knoxville) and Alan Cressler (Atlanta, GA)****[102]***The Applications of Photogrammetry and GIS for Analyzing Mud Glyphs in 19th Unnamed Cave, Alabama*

Photogrammetry has become a popular technique for rock art research in recent years. Though this method has traditionally been used for documenting sites, recent studies have demonstrated its analytical value. One such example is the use of high-resolution 3D models for observing rock art at very fine scales. These models not only aid in visualizing rock art that is difficult to see under normal circumstances, but also allow one to interpret how the art was produced. Here, we present a photogrammetric model of mud glyphs from 19th Unnamed Cave, a Woodland period cave art site in Alabama. This 3D model allowed us to see details in the glyphs that reflect the different techniques involved in their creation. Geographic information systems (GIS) then allowed for visual enhancement of the glyphs, revealing art that is difficult to see in person.

**Scharf, Elizabeth (University of North Dakota)****[8]***Archaeological Implications of Late Holocene Pollen Records from the Southeast United States*

In late prehistoric times in the southeast United States, researchers commonly find clear anthropogenic signals in pollen records. Vegetation responses to human disturbance typically involve decreases in arboreal pollen paired with increases in classic disturbance indicators, indicative of large-scale clearing of forested areas for cultivation. This study examines pollen records from multiple inland locations along the northern Gulf Coast. Vegetation and land use histories for these areas over the late Holocene are compared and contrasted. Differences in human impacts as well as pollen assemblage diversity and rate of change over time will be presented and analyzed. Data show that there is more spatial variability than previously discussed in the literature for this region.

Schatz, David [77] see Bader, Anne

**Scheel-Ybert, Rita (Museu Nacional, Universidade Federal do Rio de Janeiro) and Paulo DeBlasis (Museu de Arqueologia e Etnologia, Universidade de São Paulo)****[154]***Mangrove and the Coastal Brazilian Sambaqui Culture: Interrelations in the Southern-Southeastern Coast*

Shell mound (*sambaqui*) building societies occupied the Brazilian shores throughout several millennia, intrinsically associated with coastal environments and waterbodies, including significant patches of mangrove. In this paper we discuss the importance and centrality of mangrove ecosystem in the southern-southeastern coast as regards *sambaqui* adaptation. Evidence gathered through anthracology, archaeobotany, and zooarchaeology attests that mangrove was exploited for timber, firewood, fishing, and mollusk gathering, present in domestic contexts, but also in ritually constructed shell mounds, as funerary offerings and feasting, besides fueling ceremonial hearths.

Scheffler, Timothy [76] see Dussol, Lydie

**Scherer, Andrew (Brown University) and Charles Golden (Brandeis University)****[153]***Fields and Markets, Hilltop Forts and Missing Capitals: Recent Advances in the Archaeology of the Upper Usumacinta River Region*

Since 2017, the Alphawood Foundation has supported archaeological research on the Guatemalan and Mexican sides of the upper Usumacinta River, where the Proyecto Paisaje Piedras Negras-Yaxchilan and the Proyecto Arqueológico Busiljá-Chocoljá have carried out regional survey, remote sensing, and intensive excavations to better understand neighboring Classic period Maya polities in comparative perspective. In this paper we discuss some of the most significant results from this work. At Piedras Negras, our team documented both its ancient marketplace as well as its extensive network of defensive barricades. Throughout the region,

we have coupled remote sensing lidar with pedestrian survey to reveal an expansive agricultural infrastructure that is associated with a relatively low settlement density. We also located and began preliminary investigations of the ancient capital of the Sak Tz'ii polity.

Scherer, Andrew [209] see Hernandez-Bolio, Gloria

**Schiappacasse, Paola (University of Puerto Rico, Rio Piedras Campus)**

[44]

*Discussant*

[44]

*Chair*

**Schieber G de Lavarreda, Christa (Takalik Abaj National Archaeological Park), Rocío Albarrán Reyes (Universidad Autónoma de Yucatán), Vera Tiesler and Miguel Orrego Corzo (Parque Arqueológico Nacional Tak'alik Ab'aj / MICUDE)**

[55]

*Embodying the Heads of Tak'alik Ab'aj*

Embodyed in clay, stone, and jadeite, a wealth of anthropomorphic heads materialize the archaeological record of the site of Tak'alik Ab'aj, Guatemala, during its lengthy occupation, which spans from the Middle Preclassic to the Late Classic. This collaborative study of Tak'alik Ab'aj's contextualized inventory of 198 figurines, sculptures, and miniature ceremonial jadeite mosaic heads embraces the shifts in the portraiture portrayal of specific facial and neurocranial features and the underlying shifts in artificial head shapes these appear to project (unmodified versus "Olmecoid" pseudo-annular erect versus reclined shapes). We then compare the attributes of local head portraits with the Preclassic period cranial record of Eastern Mesoamerica and Central America and with the sculpted and molded head portrait heads from Cantón Corralito, La Venta, San Lorenzo, and Tres Zapotes. Jointly, these two comparisons grant a regional perspective to the scope of this research and point to Tak'alik Ab'aj's cultural assimilation during the Middle Preclassic period. Beyond head modifications, we perceive a local trend toward uniformity and evolution of aesthetic and artistic conventions toward and during the Classic period.

**Schilling, Timothy (Midwest Archeological Center) and Grant Stauffer (Washington University in St. Louis)**

[15]

*An Eventful History of the Cahokia Site*

Cahokia was the largest and longest-lived settlement in precolumbian eastern North America. After settling the area in the ninth century AD, fundamental changes occurred that transformed small village clusters into a sacred city in the eleventh century. Best known for its monuments and ritual spaces, the site became the center of the Mississippian world. However, the city declined and was ultimately abandoned around 1400 AD. Archaeologists traditionally understand this developmental sequence through changing regional material culture styles. Although useful for understanding broad cultural changes, this method obscures significant, impactful local events. Using a Bayesian modeling framework that offers probability-based timeframes for archaeological occurrences, we synthesize chronologies of monumental construction and quotidian use of the Cahokia site founded on sequences and groupings of radiocarbon dates. In turn, temporal distributions of ancient activities allow us to understand cause and effect relationships in the past. These chronologies form the basis of a synoptic site history where events punctuate everyday life and serve as turning points in the social relations both within and among disparate groups. They offer a starting point for building a regional chronological modeling program.

Schilt, Flora [26] see Cerezo-Román, Jessica

**Schleher, Kari (Maxwell Museum, University of New Mexico) and Judith Habicht-Mauche (University of California, Santa Cruz)**

[41]

*Unexpectedly Glazed: Pueblo II Period Glaze-Painted Pottery from the Northern San Juan Region*

Over the last few years of pottery analysis for Crow Canyon Archaeological Center's Northern Chaco Outliers Project (NCOP), a number of glaze-painted sherds with Pueblo II period designs have been identified. This is a significant finding because glaze paint technology is not commonly associated with any pottery types that date to the Pueblo II period in the northern San Juan region or the broader southwest, even though it is associated with the earlier Pueblo I period, Durango-area type of Rosa Black-on-white. Glaze-paint again becomes common in the prehispanic southwest during the Pueblo IV period in the Zuni area and in the middle and northern Rio Grande. In this poster, we examine the glaze paint present on a sample of approximately 40 sherds from the Haynie site (5MT1905), a site within the larger Lakeview Community of great houses investigated as a part of the NCOP. Our analysis includes pXRF and SEM analysis of the paint compositional recipes and other technological studies of pottery materials from the northern San Juan to understand the technology of these unique and rare examples of Pueblo II period glaze painted vessels.

Schleher, Kari [173] see Haffner, Jacob

Schleher, Kari [173] see Lujan Sanders, Mariana

**Schmader, Matthew (University of New Mexico)****[14]***Interethnic Conflict, Puebloan Resistance, and the Vázquez de Coronado Expedition to Central New Mexico (1540–1542)*

In early 1540, hundreds of people assembled in west-central Mexico to start a journey northward in search of an overland route to Asia. The viceroy of Nueva España, Antonio de Mendoza, had been sanctioned to establish connections with Asia. Mendoza chose a young provincial governor, Francisco Vázquez de Coronado, to lead his exploration. The enterprise was one of the largest and most expensive organized during early Spanish exploration of the western hemisphere. Three hundred and seventy Europeans were accompanied by an estimated 2,000 Indigenous Mexican soldiers and laborers from a wide variety of cultural groups. The expedition wound across northern Mexico into present-day New Mexico, and was the first major contact in the American Southwest between Native peoples and outsiders. Investigations at a large village on the Rio Grande north of Albuquerque, NM, have revealed the physical evidence, underlying tactics, and outcomes of a stand-off between the expedition and the ancestors of today's Southern Tiwa people. Sets of distinctive artifacts can be tied back to the differing groups who used them in the fight. This confrontation was the first, but certainly not the last, in decades of struggle between native peoples and would-be colonizers of New Mexico from Nueva España.

**Schmaus, Tekla (University of Pittsburgh)****[146]***Using Rock Art to Explore Community and Gender in Central Eurasia*

There are now multiple lines of evidence demonstrating that during the Bronze and Iron Ages, people living in Kyrgyzstan and the mountainous regions of Kazakhstan practiced semi-sedentary agropastoralism. As archaeological consensus builds around this idea, it requires us to reevaluate our understanding of how people organized their communities and households, as divisions of labor and herd management techniques differ between fully mobile and semi-sedentary societies. One possibility is through analogy with ethnographic accounts, but analogies risk uncritically foisting modern gender roles and dynamics onto past societies and past organizations of space. It may be that the analogy holds, but it is worth examining other lines of evidence to test whether it does. In particular, previous studies of the rock art of Central Eurasia focus on cosmologies, and may provide clues to the relationship between spirits, the hunt, and fertility and reproduction. I argue that these analyses may be used as another line of evidence to help understand the interpersonal relationships that constituted the societies of prehistoric Central Eurasia. In this paper, I survey archaeological sites that have evidence for agropastoralism in Bronze and Iron Ages, and explore how those sites can be linked to local rock art cosmologies.

**Schmaus, Tekla (University of Pittsburgh)****[43]***Moderator***[43]***Discussant*

Schmidt, Catherine [209] see Locker, Angelina

**Schmidt, Christopher****[26]***The Mortuary Component of Middle and Late Archaic Trophy Taking*

Middle/Late Archaic cemeteries often included victims of decapitation and/or dismemberment (i.e., trophy taking) as well as individuals buried with trophy body parts. Trophy taking is commonly addressed as an aspect of interpersonal conflict, but it has important mortuary implications, too. This study explores mortuary practices and trophy taking in several cemeteries from southern Indiana dating from about 3,000 to 5,000 years ago, when people were primarily seasonally sedentary hunter-gatherers. It takes an ethnoarchaeological approach to consider victim burial presence and position as well as motivations for trophy inclusion. For example, trophy victims were not accompanied by trophies and, at times, their burial positions deviated from others in their cemeteries. Perhaps victims maintained their social identities in ways that garnered burial in the usual places, yet the natures of their demise required supernatural interventions indicated by burial position. As for those buried with trophies, it may have been that the presence of the trophies indicated a certain prowess, although the trophies also may have offered protective properties in the afterlife. It is hoped the considerations made here expand interpretive frameworks and facilitate improved models to address trophy taking as a mortuary phenomenon.

Schmidt, Christopher [71] see Powers, Erin

Schmitt, Johanna [198] see Cooper, Catherine

**Schmuck, Nicholas (University of Alaska Fairbanks)****[31]***Human Behavioral Ecology and the Colonization of Unfamiliar Landscapes*

Human behavioral ecology (HBE) has proven a valuable theoretical framework for evaluating the archaeological record of human populations the world over. HBE models typically assume that foragers have detailed landscape knowledge, which would not be the case during the colonization of unfamiliar landscapes. By taking landscape knowledge as the predicting variable, rather than a constant, we can explore the behavioral mechanisms involved in the adaptation of human foragers to new environments and

generate predictions to test against the archaeological record. This paper presents new HBE models for human population expansion into unfamiliar environments, alongside a case study in post-glacial southeast Alaska.

Schneider, Joan [168] see Binning, Jeanne

**Schneider, Seth (University of Wisconsin–Milwaukee)**

[227]

*Living on the Edge: Late Precontact Villages on the Eastern Shore of Lake Winnebago, Wisconsin*

The eastern shores of Lake Winnebago harbor many Late Precontact village sites dating between AD 700 and 1400, including the Pipe/Camp Shaginapi site complex. This site complex contains spatially discrete Oneota and Woodland components in close proximity, which is uncommon in other Oneota localities. This paper explores the unique opportunity provided by this settlement pattern to investigate the transition and potential interaction among these different Late Precontact groups.

**Schneider, Tsim (University of California, Santa Cruz)**

[121]

*Rethinking “Long Term”: Archaeology in an Era of Self-Dealing and Sacrilegious Destruction*

Nearly three decades have passed since Kent Lightfoot’s (1995) call for an improved analytic of long-term culture change. Archaeologists working collaboratively with tribes are succeeding in dismantling artificial temporal and spatial barriers that have restricted our understanding of how Indigenous societies responded to colonial intrusion. A long-term archaeological perspective provides greater awareness of the spaces where Native peoples encountered and evaded colonialism. Perhaps most significantly, we see enhanced focus on Indigenous homelands beyond the walls of Euroamerican settlements that conventionally defined the boundaries of scholarly inquiry. A long-term view also encourages research along an extended timescale, one that positions brief events or encounters within longer continuums of Indigenous persistence and presence. Contextualizing colonialism within the longer arc of Indigenous history draws attention to the cultural practices that Native peoples maintained and modified to survive colonial violence, then and now. As we confront new and destructive political realities in American archaeology, I theorize a third role for the “long term” concept that acknowledges sustained colonialism. Recasting the concept for an era characterized by newly emboldened threats to Indigenous sovereignty and cultural heritage, I argue that attention to “time immemorial” adds new power and relevance to research with, for, and by tribes.

**Schoeman, Alex (University of the Witwatersrand)**

[126]

*Stone by Stone: Women’s Quotidian Farm Labor and the Construction of the Khutwaneng Farmscape in Bokoni, South Africa*

The ruins of stonewalled towns, villages, and homesteads mark the residential nodes of Bokoni, a second millennium AD polity in northeastern South Africa, which extended over more than 5,000 km<sup>2</sup>. The residential structures are easily visible on aerial photographs and satellite imagery, but the associated agricultural terraces are more difficult to see. Fortunately, these otherwise “invisible” terraces are clearly visible on lidar imagery, which has aided research into the configuration and complexity of urban farming in Bokoni. In Khutwaneng, a seventeenth- to early nineteenth-century CE town, all homesteads have terraced gardens adjacent to the homesteads. The pervasiveness of these terraces suggests that urban farming was an entrenched component of Bokoni urban life. While some of the terraces might have been built quickly by age sets, most appear to have been the result of quotidian farming activities. In southern Africa daily farm work was performed by women historically, and it is likely that this was also the case in Bokoni. Understanding the terraces as the product of women’s quotidian farm labor allows for reflection on the role that women and their actions as farmers played in shaping the Khutwaneng farmscape.

Schofield, John [50] see Praet, Estelle

**Schollmeyer, Karen (Archaeology Southwest)**

[85]

*Animal Remains in Ceremonial and Communal Spaces in the Mogollon Area of the US Southwest*

In ancient villages in the US Southwest, communal spaces used for ceremonial and religious purposes are most commonly identified by their size, architecture, and particular architectural features, and less often by the presence or concentration of specific artifacts. I examine concentrations of faunal remains not commonly found in sites and structures in the region to identify spaces used for ceremonial activities, using faunal data from over 80 assemblages from AD 200 to 1450 in the Mogollon area of New Mexico and Arizona. Spaces holding concentrations of the remains of animals not often used for subsistence or other everyday utilitarian purposes provide an interesting window into spaces used for religious and ritual activities in the past. In some cases these correspond to areas previously identified as communal spaces based on architectural characteristics, such as kivas and plazas, but animal remains also reveal communal ceremonial activities in spaces that would otherwise be classified as “ordinary” habitation rooms. Improving our ability to recognize such spaces enhances our understanding of the range of ceremonial activities in the past, particularly activities involving smaller groups of people.

**Schollmeyer, Karen (Archaeology Southwest)**

[175]

*Chair*

Scholnick, Jonathan [54] see Munson, Jessica

**Schortman, Edward (Kenyon College)**

[156]

*Space, Place, and Meaning at Gualjoquito, Northwestern Honduras: Rooting Power in Memory*

Wendy Ashmore initially honed some of her groundbreaking ideas about relations among meaning, memory, and power while working at the Late Classic (CE 600–900) political center of Gualjoquito in the middle Ulua drainage of northwestern Honduras. Pat Urban and I had the pleasure of co-directing that project with her. At the conclusion of the 1985 field season, a Late Preclassic burial was uncovered in the capital's core. Overwhelmed with bringing the season to a close, and working feverishly ahead of the bulldozer that revealed the burial, none of us stopped to consider what this interment signified for the history of the middle Ulua's inhabitants. Based on conversations with Wendy over the years and a review of her field records, this paper brings that long-neglected interment back into the discussion of how Gualjoquito's rulers reframed a largely egalitarian past to legitimize their claims to preeminence. This paper may not have been the one that Wendy would have written. It is, however, deeply informed by her admonition to attend carefully to the ways power contests are often fights over meaning, the latter emerging as connections among people, things, and memories are creatively restructured by different factions seeking to assert and challenge their claims to prominence.

**Schortman, Edward (Kenyon College)**

[188]

*Discussant*

**Schotsmans, Eline (University of Wollongong), Gesualdo Busacca (Independent Researcher) and Marco Milella (University of Bern)**

[155]

*Commemoration of the Dead through Mortuary and Architectural Use of Pigments at Neolithic Çatalhöyük, Turkey*

Pigments are frequently associated with symbolic use and ritual performance, contributing to commemoration and the creation of social memories in past and present societies. The Neolithic settlement of Çatalhöyük, central Anatolia, Turkey, features a roughly millennium-long occupation, from 7100 to 5950 cal BC, with a large dataset of elaborate symbolic assemblages and subfloor burials, often associated with pigments. In this study, patterns in pigment use from funerary and architectural contexts, by type, application, anthropological data and archaeological associations, are analyzed and discussed from a social perspective. The study confirms that several selections took place during different sequences of mortuary practices, not based on variables such as sex or age-at-death. The results also indicate a correlation between pigment use in funerary contexts and domestic decoration. This suggests that pigments and paintings, in conjunction with intramural burials and secondary/tertiary mortuary practices, including cranial retrieval, circulation, and redeposition of skeletal elements, were integral parts of the relationship between the living and the dead at Çatalhöyük. This study contributes new insights into the importance of symbolic pigment use to encode commemoration and social memories in this early farming community. It also emphasizes the importance of approaching mortuary practices as a dynamic process.

Schreiner, Morgen [173] see Wichlacz, Caitlin

**Schroder, Whittaker (University of Florida) and Timothy Murtha (University of Florida)**

[54]

*Regional Variation and Inequality across the Maya Landscape*

The emergence and expansion of inequality has been a topic of household archaeology for decades. This question has been informed by ethnographic, ethnohistoric, and/or comparative studies of households, offering an important baseline of information about status, wealth, and well-being, especially in the Maya lowlands where households are accessible in the archaeological record. Between sites, more research is necessary to assess how these physical measurements of household remains compare. This paper investigates the intersection of landscape, household, and community by relying on a multiscale analysis of households identified in NASA's G-LiHT lidar data across southern Mexico, using the Gini index contextualized within a broader study of land use, land management, and settlement patterns. While we conclude that the Gini index is useful for establishing a comparative understanding of settlement, we also recognize that the index is a starting point to identify other ways to study how differences in households intersect with diverse ecological patterns. Raising questions about labor availability, landesque capital, and intensification, we illustrate how systematic studies of settlement, along with indices like the Gini index, can be coupled to broader studies of landscape archaeology to better interpret changing patterns of land management and settlement across the Maya lowlands.

**Schroeder, Hannes (Globe Institute, University of Copenhagen), Jazmin Ramos Madrigal (Globe Institute, University of Copenhagen), Miren Iraeta Orbeagozo (Globe Institute, University of Copenhagen), Jonas Niemann (Globe Institute, University of Copenhagen) and Corinne Hofman (Leiden University)**

[19]

*Exploring the Limits of Ancient DNA Preservation in the Caribbean*

Advances in ancient genomics have started to produce fascinating insights into Caribbean population history complementing archaeological studies and raising new questions. However, the Caribbean climate poses serious challenges for ancient DNA studies in the region as DNA degrades more rapidly in warmer settings and it is unclear how long ancient DNA can potentially survive in the tropics. To better understand the limits of and factors influencing ancient DNA preservation in the Caribbean we systematically explored the effects of age, sample type, and burial setting on the level of DNA preservation, using low-coverage,

high-throughput DNA sequencing data of over 200 human skeletal samples from 28 sites across the region. Results show that on average ancient DNA degrades around 10x faster in the Caribbean than in more temperate settings (e.g., in North America) and that it will be challenging to recover ancient DNA from samples that are over 5,000 years old, but they also highlight the importance of sample type and burial context for DNA preservation, which can inform future ancient DNA studies in the region.

Schubert, Blaine [221] see Petrovic, Vid

**Schuldenrein, Joseph (Geoarchaeology Research Associates)**

[81]

*"Bringing Up Sonny": The Trajectory of Pragmatic Archaeology in the Twenty-First Century*

Heritage Management and CRM are currently entering early adulthood, a rite of passage wherein the why's, how's and where's of 106 are unquestioned. If development, preservation, and legacy guided the profession's emerging stages (latter twentieth century) then climate change, disaster, war and sustainability have reconfigured today's priorities. It's a sign of the times. Sonny Trimble and partners have arguably guided this rite of passage. His projects chronicle a trajectory that grew stepwise with time. Technology at the forefront of these projects provided templates for deeper knowledge of past economic and social systems. These afforded a window on future sustainability. Our profession can, is, and must move to relevance with visions derived from more refined documentation of the past. We review Trimble's maturation, as he has systematically recast 106 to revive the heritage of disenfranchised minorities (African Burial Ground), recast light on Native American legacy (Carlisle Cemetery), extract meaning from the otherwise futile Iraq War (Mass Graves), and to stage a revival to America's economy during the Great Recession (VCP and Curation) in a manner reminiscent of FDR's New Deal. Yet Trimble's contributions remain incomplete and there are challenges ahead for him and the pioneering teams motivated by his vision.

**Schulenburg, Marcus (Archaeological Research Institute)**

[65]

*What Lies Between: Exploration of a Potential Fort Ancient Courtyard and Surrounding Structures*

A household is more than four walls and a hearth, and a village is more than houses in proximity to each other. Households and villages are made up of people and their relationships. These relationships often appear to be reflected in the archaeological record through spatial proximity; a cluster is interpreted as a socially meaningful unit. To expand our understanding of Early Fort Ancient households and their relationships beyond adjacency this poster presents a summary of excavations of two structures and a potential adjoining courtyard at the Guard Site (12D29), a Fort Ancient village occupied ca. AD 1000–1250. The poster will examine the chronological sequence, and relationships between the potential households, and use of space throughout this shared area.

Schulenburg, Marcus [114] see Comstock, Aaron

Schulenburg, Marcus [65] see Emery, Christina

Schulenburg, Marcus [65] see Polk, Sara

Schulenburg, Marcus [69] see Raab, Bailey

Schulenburg, Marcus [20] see York, Logan

**Schulting, Rick, Marine Caldarola (University of Oxford), Andrea Czermak (University of Oxford), Olga Goriunova (Irkutsk Institute of Archaeology) and Andrzej Weber (University of Alberta)**

[198]

*First Isotopic Evidence for Iron Age Pastoralists in Cis-Baikal, Southern Siberia*

Lake Baikal is well-known for its large hunter-gatherer cemeteries spanning the Early Neolithic (7600–6700 BP) to the Early Bronze Age (5000–3500 BP). Previous isotopic research has demonstrated the importance of aquatic resources; however, far less is known about post-EBA populations, due in part to a long mortuary hiatus. Burials remain scarce until the Early Iron Age (ca. 2700 BP). Even then, domestic herbivores appear to be of limited importance for subsistence, forming only a minor component of faunal assemblages. Instead, EIA populations seem to have made considerable use of aquatic resources as did EBA populations in the same region. This has now changed with the analysis of EBA and EIA burials from the site of Uliarba. The EIA isotopic results are consistent with a predominantly terrestrial diet with minimal input from aquatic resources. Moreover, sequential analysis of dentine suggests that infants were weaned onto a diet that included millet, a cereal previously only known from 100 km east of Lake Baikal. These new results suggest the coexistence of two distinct EIA populations in Cis-Baikal, one following a "traditional" fisher-hunter-gatherer subsistence economy little different from that of the EBA, the other committed to pastoralism and millet cultivation.

**Schulting, Rick**

[198]

*Chair*

Schulting, Rick [29] see Santana Sagredo, Francisca

Schultz, John [113] see Ferrell, Morgan

Schultz, John [93] see McGehee, Kelly

**Schultz, Julian (University of Michigan), Ergys Hasa (Instituti i Arkeologjisë), Michael Galaty (University of Michigan), Richard Yerkes (Ohio State University) and Lorenc Bejko (Universiteti i Tiranës)**  
[147]

*Mountains and Meadows: Preliminary Data toward Understanding Prehistoric Albanian Herd Management*

Balkan prehistory has been the subject of a considerable amount of zooarchaeological scholarship in recent years. Work conducted along the Adriatic coast has successfully identified a number of prehistoric herd management strategies, including transhumance, or the seasonal movement of pastoralists and their livestock from the lowlands to highlands (and vice versa). This seasonal movement is a well-documented global tradition, and most interestingly, is still practiced today throughout the Balkans. In turn, Albania—given its lowland coast and upland interior—presents the perfect setting to document when it began and how it affected the demography of humans and animals. This paper will present stable isotopic data from the upland site of Gajtan (excavated during the PASH project) in an effort to identify whether or not this seasonal behavior did indeed occur, and to begin documenting prehistoric Albanian herd management strategies during both the Neolithic and Bronze Ages. In addition, it will seek to lay out a roadmap for future field and labwork, in the greater hope of placing prehistoric Albania within the broader Balkans.

**Schultze, Carol (Westland Resources Inc. / CARI-Peru)**  
[143]

*Minerals Ores and Metals in Pre- and Postcontact Americas*

The function, technology, ideology, and importance of copper, silver, and gold changed radically in the face of European expansion into the Americas. In most instances, evidence for precolumbian metal work and mining has been erased in the colonial and territorial periods by the European drive to obtain minerals of economic importance. The colonial experience of metals in many ways highlights the cultural clash of Old and New World economic and environmental perspectives. Drawing on decades of work by Avi Buckles and colleagues at Westland Resources Inc. in the copper-rich American Southwest, along with the author's own research in South America, this paper examines evidence for precolumbian metallurgy in the New World and contrasts it with developments during the contact/historic period.

**Schumacher, Emily (University of Tulsa)**  
[166]

*The Military Landscape of St. Croix, Danish West Indies (1733–1917)*

This presentation reports on ongoing research into the military landscape of the US Virgin Island of St. Croix. The Danish West India and Guinea Company purchased St. Croix from France in 1733, after which they began fortifying the island to serve their mercantilist interests. Though their control ended with the dissolution of the Company in 1754, sovereignty passed to Denmark, where it remained almost exclusively until 1917, when the United States purchased the Danish West Indies. Methods discussed include digital archival research, the examination and digitization of historic maps, and their analyses within GIS. Through these methods, this project seeks to elucidate the relationship between military control, sociopolitical power, and economic influence on the St. Croix military landscape during the Danish period (1733–1917), emphasizing the eighteenth century.

Schumacher, Mara Lou [16] see Mentzer, Susan

**Schurr, Mark (University of Notre Dame) and Madeleine McLeester (Dartmouth College)**  
[126]

*Isotopic Evidence for Protohistoric Field Locations in Northeastern Illinois*

In the western Great Lakes region of the USA, late prehistoric and early historic Indigenous fields are often difficult to investigate because their archaeological signatures are faint and easily destroyed. They have been identified largely via rare remnants of ridged fields and historical records. With the majority of Indigenous fields destroyed, important aspects of cultivation remain ambiguous, especially the ecology of cultivated areas. In addition to archaeological indicators of field location, the choice of specific environmental settings (prairie, wetland, upland forest, etc.) can be encoded in the stable isotope ratios of cultigens. Stable carbon- and nitrogen-isotope ratios of maize kernels and wild plants from the Middle Grant Creek site (11WI2739), an early seventeenth-century village in northeastern Illinois, are used to better understand agricultural practices during one of the coldest periods of the Little Ice Age.

Schurr, Mark [38] see Conly, Caitlin

Schurr, Mark [164] see Wheeler, Joseph

Schwadron, Margo [18] see Brownstein, Corey

**Schwalbe, Emily (Northwestern University)**  
[142]

*Discussant*

**Schwartz, Christopher (Northern Arizona University), José Luis Punzo Díaz (Instituto Nacional de Antropología e Historia) and Ben Nelson (Arizona State University)**

[14]

*Pajaros del Fuego: Macaws and Parrots from Mesoamerica to the US Southwest / Mexican Northwest*

Recent studies have established the long-term significance of scarlet macaws (*Ara macao*) to people living throughout the prehispanic Americas. However, scarlet macaws were not the only psittacine with which past people interacted, and the local importance of macaws and parrots manifested in different ways over time and across space. In this paper, we explore patterns in human acquisition, breeding, transportation, exchange, and feather use; the roles of macaws and parrots in materializing ideology and cosmology; and the deposition of body parts after death in the diverse regions that make up Mesoamerica. We draw on various sources of information about Mesoamerican macaw and parrot use, including biological, textual, ethnohistoric, ethnographic, iconographic, and archaeological. We discuss the comparisons, contrasts, and possible continua between Mesoamerican and the US Southwest / Mexican Northwest practices pertaining to scarlet macaws and other parrots.

Schwartz, Christopher [14] see Plog, Stephen

Scogin, Codi [173] see Mink, Philip

**Scott, Ann (Terracon Consultants Inc.)**

[177]

*Chair*

**Scott, Rachel (DePaul University)**

[42]

*Religious Practice and Community Identity in Early Medieval Ireland*

During the early medieval period in Ireland (ca. 400–1100 CE), the majority of the population lived in individual farmsteads dispersed across the landscape. Their sense of a common identity thus derived not from the daily interaction required by shared residence but from other forms of engagement. As the influence of the Christian Church grew over time, its rituals became increasingly important in the creation and maintenance of even lay communities. Such practices occurred at a variety of sites. The early Irish visited holy wells, followed pilgrimage paths, attended mass in churches, and buried their dead in ecclesiastical cemeteries. While gathering together to perform these activities would have demonstrably promoted a group identity, individual acts of devotion also strengthened communal bonds by referencing shared beliefs. Moreover, such events would have occurred periodically, with repeated visits to these sites acting to reinforce community ties. By engaging in these religious practices, the inhabitants of an area not only constructed their local community but also indicated their participation in the larger early Christian community in Ireland and abroad.

**Scott, Rachel (DePaul University)**

[42]

*Chair*

Scott, Shaylee [117] see Smallwood, Ashley

Scott, Stacy [131] see Tveskov, Mark

**Scott Cummings, Linda (PaleoResearch Institute Inc.) and R. A. Varney (PaleoResearch Institute Inc.)**

[39]

*Better Dating through Chemistry and Micro-provenience: What Happens When You Date Multiple Locations on Ceramic Vessels?*

The micro-provenience of your sample, for instance on a cooking vessel, is important. Dating multiple locations on individual vessels contributes to answering the question “is all charred food crust created equal?” Less obvious is the answer to the question “if you radiocarbon date charred food crust from a vessel, do you have an accurate date for use of the vessel?” We compare dates on food crust and annuals from the same context. Does dating another area of the vessel yield a confirming or a discrepant date? What influences these dates? Is there a freshwater reservoir effect? If so, when or where is that an issue? Can it be reversed? Is it possible to “uncook” the proteins or remove the fats and lipids from food crust or anything else? Does any of this research contribute to understanding use of the vessel? Is lab chemistry the answer to producing accurate dates? Finally, after much testing, we have answers to these and other pressing questions. We present recommendations for lab chemistry and review the best areas on a vessel to sample.

**Scott Cummings, Linda (PaleoResearch Institute, Inc.)**

[134]

*Discussant*

Scunderlick Eloy de Farias, Deisi [63] see Admiraal, Marjolein

Seager-Boss, Fran [140] see Krasinski, Kathryn

**Searcy, Michael (Brigham Young University)**

[118]

*Sr. Ciencia and El Mago: A Legacy of Archaeological Discovery and Lifelong Learning*

As partners in the pursuit of archaeological discovery, Paul Minnis and Michael Whalen developed an enduring professional relationship that resulted in productive careers marked by multiple field projects and numerous scholarly publications. While engaged in academic archaeology, they also fostered a new generation of archaeologists along the way. An integral part of their pedagogy was carried out in the field where students worked alongside Mike and Paul, learning not only how to carry out an archaeological project from beginning to end, but also how to collaborate in a field of study that has become increasingly interdisciplinary. This paper presents my own experiences with these honored scholars and their lasting impact on me and future generations of archaeologists.

**Searcy, Michael (Brigham Young University)**

[118]

*Chair*

Searcy, Michael [176] see Jensen, Samuel

Searcy, Michael [14] see Snow, Meradeth

Searcy, Michael [111] see Summers-Wilson, Rachel

**Sebastian, Lynne (SRI Foundation)**

[219]

*Discussant*

**Sebastiani, Alessandro (University at Buffalo)**

[132]

*Exploring Glass Recycling in Etruria: Notes from the Ager Rusellanus (Grosseto, Italy)*

Between 2010 and 2016, major archaeological excavations in south Tuscany (Italy) revealed the existence of a large manufacturing district of Imperial period (first century CE–sixth century CE). Located along the last bend of the Ombrone River, and on the liminal southwestern edge of the ager Rusellanus, the complex focused on recycling glass and metal objects through the installation of several workshops; among these, two possible glass workshops were discovered where glass furnaces were in use between the late first and the mid-fourth century CE. A rich assemblage of collected glass wastes informs on production activities and recycling exercises that represent a unicum for the region. The manufacturing district worked simultaneously with a nearby building where the remains of a workshop dedicated to the production of Egyptian blue pigment was identified. Situated in a vital position across terrestrial, riverine, and maritime routes, these ateliers provide significant insight into the specific activities of glass recycling in Roman Etruria for which little was known in the Imperial period. The paper will detail their archaeological sequence, as well as trying to identify wider economic patterns with the capital city of Rome and the Mediterranean basin.

**Sedig, Jakob (Harvard University) and Meradeth Snow (University of Montana)**

[86]

*Biological Connections in the Southern Mogollon*

In this paper we review and explore the evidence of biological connections between southern Mogollon groups, particularly Mimbres and Paquimé. The renewed attention to the dynamic nature of interactions among the ancient people who inhabited the southern US Southwest / Mexican Northwest has revealed much evidence of extensive interaction within the broad cultural sphere. This evidence is largely based in examination of artifacts, architecture, and other aspects of material culture. Less well understood is the degree to which this interaction is reflected biologically. In other words, were the interactions that have been recently identified the result of diffusion, or were people moving and mixing with one another? Though limited, we examine morphological and genetic evidence of connections between north and south, and what implications those data have regarding significant transformations that occurred in the southern Mogollon, such as the movement of people from the Mimbres into Casas Grandes after the Mimbres Classic period. We also discuss the complex nature of conducting respectful research on ancient individuals, and what could potentially be learned from future analyses of molecular material such as ancient DNA and stable isotopes.

**Seetah, Krish (Stanford University)**

[80]

*Post-emancipation Lifeways of Laboring Peoples in Mauritius: Evidence from Former Enslaved and Indentured Communities in the Indian Ocean*

Mauritius served as a critical transitional hub along slave trading routes, as well as home to a significant number of enslaved people during the period of Dutch and French hegemony. Under the British, it staged the "Great Experiment" witnessing the arrival of over 400,000 indentured workers who filled a labor void following abolition in the trade in slaves. This presentation describes important findings from sites of work, i.e., plantations, as well as social salient spaces, to shed light on the lifeways of laboring peoples during the period of colonialism. The presentation discusses the relationships between this island, the wider region, and beyond, and concludes with a summary of the ways in which enslaved and indentured peoples contributed to the cultural uniqueness of modern Mauritius.

**Sefton, Juliet (Tufts University) and Mark McCoy (Southern Methodist University)****[154]***A New Record of Late Holocene Relative Sea-Level Change in the High Basaltic Islands of Micronesia: Implications for Early Site Discovery and Monument Building*

Understanding sea-level change has been vital for reconstructing human migrations in Oceania. The new communities established after the discovery and colonization of the remote islands of the Pacific in the Late Holocene (ca. 3–5 kya) on most islands would have seen falling, or stable, relative sea levels over generations. We present new evidence from mangrove sediments that indicate the opposite of this well-established regional trend, with sustained relative sea-level rise since the initial colonization of the islands of Pohnpei and Kosrae in the Federated States of Micronesia. Mangroves inhabit a narrow and quantifiable elevation range with respect to mean tide level, and suggest (1) that the oldest coastal sites on the Micronesian high basaltic islands are 1.9–2.5 m below the present tide level, and (2) in AD 1200–1300 at the start of the construction of monumental architecture at the sites of Nan Madol (Pohnpei) and Leluh (Kosrae), sea level was ~1.2 m lower than present. Today, Nan Madol and Leluh are notable for their artificial islands, stone-wall sea breaks, and canals. The revised history of sea-level change we present from radiocarbon-dated mangrove sediment implies that these iconic architectural elements may represent adaptations to centuries of rising tides.

**Seidemann, Ryan (Louisiana Department of Justice) and Christine Halling (Louisiana Department of Justice)****[197]***Dirt for Sale: Desecration, Site Disturbance, or Insignificant Gimmick? The Archaeological and Legal Implications of "Cemetery Dirt" Sale Offerings on eBay*

In a longitudinal study spanning four years (2017–2021) that raises more questions than it answers, the Louisiana Department of Justice has monitored alleged cemetery dirt sales on the eBay online sales platform. Data from 725 such offerings are analyzed in an attempt to answer the questions of whether these listings represent acts of cemetery desecration under the law or real threats to site integrity from an archaeological perspective. Bolstering these analyses are the results of various seizures of such material from Louisiana-based sellers. These analyses include microscopic sample examination for evidence of human bone and cemetery construction materials (i.e., bricks, concrete, or potential casket fragments). These findings are used to begin a dialogue regarding whether this activity is something that should be of concern for archaeologists as well as positing theories behind such dirt commodification. This entire inquiry is examined in the broader milieu of modern witchcraft and serial killer fetishization (both common observed proposed associations in the listings), as well as through the lens of landscape structural violence in an effort to determine whether the graves of underprivileged peoples are targeted for such treatment.

**Seidemann, Ryan (Louisiana Department of Justice)****[1]***Discussant***[197]***Chair***Seki, Yuji****[192]***Public Architectures and Social Integration in the Early Formative Period*

While the Early Formative period (Early Initial period) is important because it is the time of the first appearance of pottery in the Central Andes, it has attracted relatively little attention as a research topic compared to the Initial Formative period (Late Archaic) and the Middle Formative period (Late Initial period), which have been the focus of recent investigations. However, Richard Burger and Lucy Salazar's long-term investigations in the Manchay culture sites in the Lurín Valley on the central coast of Peru demonstrated the presence of segmented regional integration during the Early to Middle Formative periods. Their research made it possible to recognize cultural continuity between the Early and Middle Formative periods. This paper will present data from the northern Central Andes during the same periods and compare them to the Central Coast. In the north highlands and in the valleys along the rivers flowing toward the coast, archaeological sites with large public architecture have been studied, revealing a variety of social complexity and the continuity and discontinuity from the Early to Middle Formative periods. Through a comparison of data from the two regions, I will reevaluate the importance of the Early Formative period in the history of Andean civilization.

Sekiguchi, Kazuhiro [163] see Sugiyama, Saburo

**Seligson, Ken (California State University, Dominguez Hills) and Evan Parker (Millsaps College)****[172]***Shifting Land Use Patterns within Small-Scale Communities in the Puuc Region of the Northern Maya Lowlands*

A recent lidar airborne scanning survey of the eastern Puuc region of the northern Maya lowlands has helped archaeologists identify dozens of small-scale communities located amid the Bolonchen hills. This poster presents an analysis of changes in land use patterns from the Preclassic through the Classic period in the eastern Puuc by focusing on two small-scale communities, Cerro Hul and Site A. The sites are located adjacent to one another but were occupied at least 500 years apart. A combination of ArcGIS-based spatial analyses and preliminary ground-truthing data allows for an examination of how residents of small-scale communities changed their approaches to modifying and interacting with their surroundings in the environmentally distinctive Puuc region. Preclassic period communities constructed their residences and civic architecture within stretches of flat terrain, while later Classic period communities mainly constructed their residences on the surrounding raised terrain and hills. Interactions with the long-abandoned Preclassic mounds of Site A likely helped structure subsistence practices and the modeling of the cultural landscape by later Classic period inhabitants at Cerro Hul. This diachronic study highlights the types of research questions that can be addressed using digital archaeological approaches during periods when field research is precluded.

**Sellen, Adam (Universidad Nacional Autónoma de México)****[55]***Ancestral Faces: The Physiognomy of Zapotec Urns*

Since the late nineteenth century, archaeologists have analyzed the physiognomy of Zapotec urns and produced a broad array of studies. These attempts often supposed that Western concepts of portraiture existed in Mesoamerica and that an individual's likeness was a desired aesthetic. In this paper I will propose otherwise and explore the variations in physiognomy present in Zapotec urns. The standardization of the features suggests that the effigies are representations of idealized ancestors, while the differences point to stylistic variation according to region and artist.

**Seltzer-Rogers, Thatcher (University of New Mexico)****[86]***Superando una frontera intelectual: Investigating the Animas Phase and Mimbres-Casas Grandes Connections in the International Four Corners*

Investigations into lifeways and historical process of the American Southwest / Mexican Northwest (SW/NW) have often either terminated at the US-Mexico Border or been restricted to north or south of it. Yet, historical processes that occurred across this transborder space predate any said border. Notably, some central processes include the northward expansion of the Casas Grandes culture into what is termed the Animas Phase during the thirteenth and fourteenth centuries, as well as the ongoing discussion regarding the extent of cultural and genetic influence by hypothesized migrating Mimbres populations into northern Mexico. I discuss the impacts of an imagined, but impactful scholastic border that has hampered the integration of trends identified north of the border with those found south, and how investigating sites in the transborder space can greatly improve our understanding of the SW/NW as a whole. I explore these topics by highlighting new data from Animas Phase and Mimbres contemporary sites along the border.

**Seltzer-Rogers, Thatcher (University of New Mexico)****[86]***Chair*

Semanko, Amanda [68] see Welker, Martin

Semaw, Sileshi [90] see Leiss, Amanda

Seowtewa, Octavius [152] see Spears, Michael

**Sepúlveda, Marcela, Benjamin Ballester (Museo Chileno de Arte Precolombino), Gloria Cabello (Pontificia Universidad Católica de Chile-CIIR), Sebastian Gutierrez (Universidad de Tarapacá) and Philippe Walter (CNRS-Sorbonne Université)****[155]***Unraveling the Materiality of Color in the Atacama Desert (North of Chile): Social Implications of Mineral Polychromy during Late Precolumbian Periods*

The color palette used in the rock art of the Antofagasta region (northern Chile), in the heart of the Atacama Desert, shows unusual polychromy (up to five colors) since the Formative period (ca. 2000 BC). On this occasion, we present a set of polychrome objects from different funerary sites associated with the end of the regional precolumbian chronological sequence (ca. AD 1000–1500). Together with the description of the iconography and the symmetry of the motifs, the results of the physicochemical characterization of the mineral paintings, obtained using X-ray fluorescence and hyperspectral imaging, are exposed. The research reveals a dual and simultaneous practice: while painted motifs demonstrated a visible interregional flow of information, paintings' chemical analysis testifies to a local pigment production associated with millennial exploitation of mineral coloring matter. In contrasting visual and material productions, we explore and discuss the social value and role of mineral pigments during the late Atacama precolumbian periods. From an interdisciplinary approach to the materiality of color, we then evaluate social implications of mineral polychromy in this south-central Andean region.

**Sepúlveda, Marcela****[155]***Chair*

Servera-Vives, Gabriel [108] see Llobera, Marcos

**Seyler, Samantha (University of Pennsylvania) and Richard Leventhal (University of Pennsylvania)****[25]***Hiding in Plain Sight: Abandonment and Mobility of the Nineteenth- and Twentieth-Century Maya in the Yucatán*

The Maya rebellion of the nineteenth century, known as the Caste War of Yucatán (1847–1901), was one of the most successful Indigenous uprisings in the Americas. During the war and following an uneasy peace treaty of 1901, the subordinate position of the Indigenous Maya in Mexico was reinforced. Throughout the nineteenth and twentieth centuries and within the contested landscape of the Yucatán (especially the central and eastern areas), the Maya people used the dense jungle of the region to live—sometimes visible to visitors of this region and sometimes invisible “in the bush.” Hiding in plain sight was one of the survival strategies for the

Maya of the region. Just prior to the Caste War, there is evidence that more and more people leave the town centers and head to the jungles. During the twentieth century, Mexicans and foreigners visited this abandoned area of the Yucatán to see ancient cities or to explore the region. They write in fear and wonderment about the sudden appearance and disappearance of Maya warriors or "Indios bravos." Even today, although in smaller numbers, living outside of town centers within the jungle continues to "hide" people and families from governmental contact and control.

**Sghinolfi, Amedeo (University of Western Ontario)**

[84]

*Living in Between: The Occupation of the Carabamba Valley, Northern Peru (1800 BC–AD 1532)*

Archaeological investigations in the Central Andean region have usually focused on the coast and the highlands, but interest in the zones that connect these two ecological macro-areas has grown over the last few decades. On the western slopes of the Andes, these borderlands include the resource-rich chaupiyunga (ca. 500–2,300 m asl). One such borderland is the Carabamba Valley (ca. 150–3,500 m asl) in Northern Peru, a natural corridor that connects the coastal Virú Valley to the Carabamba Plateau. This paper presents the results of a pedestrian survey that was conducted in the Carabamba Valley in 2019 and that led to the identification of several unreported archaeological sites. The analysis of artifacts collected from the surface reveals a long occupation spanning between the Initial period (ca. 1800–1000 BC) and the Late Horizon (AD 1470–1532). Data suggests that this stretch of land played an important role in supplying with resources the arid coast and the highlands, and putting into contact peoples featuring different sociopolitical organizations, beliefs, identities, and material cultures. Manifold interactions among local people, coastal states and empires, and highland polities left a mark on the valley, shaping its settlement patterns throughout time.

**Sghinolfi, Amedeo (University of Western Ontario)**

[84]

*Chair*

Shackley, M. Steven [14] see Dolan, Sean

**Shafer, Harry (Texas A&M University Professor Emeritus)**

[86]

*Mimbres Hearths and Floor Vaults: Pathways to the Ancestral World*

The designs of Mimbres hearths changed from round to rectangular during the pithouse-pueblo transition ca. AD 950–1000 in the middle Mimbres valley settlement at the NAN Ranch ruin. Accompanying this change was a shift to intramural cemeteries and change in ceramic styles. Somewhat later in the early Classic period a rectangular box or floor vault was constructed adjacent to the hearth in specific rooms. The view presented here is that the floor vault served as a portal to the ancestor world below. The largest intramural cemeteries in household room clusters were in the rooms with the floor vaults. Other rooms without floor vaults also contained burials, but the association of floor vault rooms with prominent cemeteries is unequivocal at the NAN Ranch site. Three rooms with floor vaults had an adult male buried beneath them, two of which had outstanding jewelry in association. This paper takes a closer look at the significance of the changes in hearth features, burials, and the possible relationships that may mean with regards to shift in ancestor veneration and cosmology.

**Shahack-Gross, Ruth**

[6]

*Moderator*

**Shannon, Katy (Evergreen Plantation)**

[27]

*Discovering the Ancestors: The History of Evergreen Plantation*

Founded in the 1700s by German subsistence farmers, Evergreen eventually became a large sugar cane plantation. Over 400 individuals were enslaved on the plantation. On Creole plantations, both free and enslaved individuals spoke French, practiced Catholicism, and shared a cultural heritage. With the rise of the domestic slave trade, enslaved people forcibly sold south arrived on the plantation, bringing with them a more "American" way of life. Using a wealth of primary source documents, we have been able to reconstruct the enslaved community and the lives of many of the enslaved individuals who labored at Evergreen.

**Shantry, Kate (Washington State University) and Mario Zimmermann (Washington State University)**

[18]

*Plant Residues on Hot Rocks from ?áčit tal=bix<sup>w</sup> (People) by the River in the Southern Salish Sea Region on the Northwest Coast of North America*

Exploring relationships between people and plants through residues on culturally heated rocks (CHR) is one way to understand ancient landscapes and revisit traditional cooking methods. This pioneer endeavor examined alkaloid residues on archaeological and experiment boiling stones, particularly elderberry (*Sambucus*) and Western red cedar (*Thuja plicata*). Results of this pioneer study of ancient metabolomics on CHR confirmed the presence of residues from thermal features that varies from the paleobotanical components of the same features. We observed uniformity of compounds across the sampled features in greater concentration than the surrounding environment based on soil control samples.

Shantry, Kate [28] see Rorabaugh, Adam

**Sharapov, Denis (Tyumen State University)**

[157]

*The Tyranny of Nomadic Ethnography: Reapproaching Bronze Age (2100–1400 BC) Population Mobility in the Central Eurasian Steppes*

Late Bronze Age (LBA; 2100–1400 BC) societies of the central steppes are often viewed as seasonally mobile pastoralists. However, the archaeological record of the southern Urals and northwestern Kazakhstan indicates year-round occupation. The lines of evidence that suggest sedentism include: dental cementum increment analysis, substantial investment into settlement architecture, massive accumulations of human debris, signs of house repair/rebuilding, herd structure, pasture productivity estimates, isotope analysis of human dentition and animal bones. In spite of the above, the purportedly high levels of human mobility preclude many researchers from studying the demographic and spatial structures of LBA regional communities. In particular, virtually no absolute population estimates exist for the LBA societies of the steppes. My report aims to remedy this issue by introducing the possibility of applying a rich array of settlement pattern analytical tools (e.g., settlement hierarchy, demographic centralization) to investigate LBA pastoralists.

**Sharma Ogle, Mini (Portland General Electric)**

[165]

*Discussant*

**Sharp, Emily (Arizona State University)**

[93]

*Examining Rates of Physical Violence in the Callejón de Huaylas, Peru, from 1100 to 1300 CE*

Previous research has demonstrated a significant increase in warfare among some highland, Andean communities during the Late Intermediate period (LIP) from 1000 to 1450 CE. The geographic extent of violent conflict is unknown for many areas including the Callejón de Huaylas. Osteological analyses of 47 individuals, comprising juveniles and adults, were conducted to assess skeletal evidence of physical violence in this north-central highland region. These human remains were interred in above-ground tombs and in spaces under boulders at two sites in the central valley. New radiocarbon dates indicate the individuals lived during the early phase of the LIP from 1100 to 1300 CE. Results show the majority of people exhibit cranial lesions. Differential diagnoses of lesions were performed to distinguish fractures caused by trauma from osteological changes related to biological development, disease processes, or surgical interventions. Findings reveal individuals sustained high levels of cranial trauma and resemble prior bioarchaeological analyses of trauma frequencies from south-central highland regions. This study expands our knowledge of who experienced physical violence during the LIP by reporting evidence from an understudied area, and it lends further support to the assertion that violence, and by extension warfare, was widespread in many highland locales. This presentation contains images of human remains.

**Sharp, Kayeleigh (Southern Illinois University Carbondale/Johnson County Community College)**

[224]

*Elevated Metals: Copper Mining and Life Cycle at Songoy-Cojal, Peru*

The organization of copper mining and metallurgy is an important indicator of complexity, sociopolitical and economic sophistication of Central Andean cultures. But what about wider spread notions of copper as a metaphor for human life? In this regard, the significance of the Songoy-Cojal site situated on the north bank, Zaña River cannot be underestimated. It is notable for its geophysical and locational uniqueness, and the cultural evidence it presents. Songoy's principal mound was strikingly built on a stone outcrop that overlooks the middle Zaña River floodplain, with unimpeded views north and south allowing monitoring of the vast central sector of the Lambayeque Complex. It is also exceptional for the range and quantity of northern Gallinazo-style artifacts documented in both looted funerary (surficial) and systematically excavated household-level multi-crafting workshops. This notwithstanding, is like no other site known to date for yet another reason; the Huaca Songoy was built on top of an exposed mineralization of high-quality copper. Combined, these lines of evidence demand attention toward the significance of copper and copper ores, their metaphoric relationship to human life cycles, and the elevated role of those who controlled access to and facilitated its transformation from 600 to 850 CE at Songoy-Cojal.

**Sharp, Kayeleigh (Southern Illinois University Carbondale/Johnson County Community College)**

[224]

*Chair*

**Sharpe, Ashley (Smithsonian Tropical Research Institute), Richard Cooke (Smithsonian Tropical Research Institute) and Nicole Smith-Guzmán (Smithsonian Tropical Research Institute)**

[151]

*How Advances in Archaeobotany Benefit Us All: Perspectives from Zooarchaeology, Bioarchaeology, and Isotope Research*

[WITHDRAWN]

Sharpe, Ashley [154] see Reeder-Myers, Leslie

**Sharratt, Nicola (Georgia State University) and Sofia Chacaltana-Cortez (Universidad Antonio Ruiz de Montoya)****[84]***Tierra del sol, la Amistad y los recursos: Incursion and Interaction in Southern Peru*

Located at a nexus of accessibility, the Moquegua Valley has long been shaped by connections beyond its immediate environs. Populations living within the temperate agricultural zone that begins around 1,000 m asl have for millennia negotiated relationships with the coast, the sierra, the altiplano and more recently across national borders. Scholarship on Moquegua emphasizes what has drawn people to the valley, the reasons why the Middle Horizon states, LIP arrivals, the Inca and Spanish Empires, and today multinational mining corporations and international researchers are attracted to Moquegua. In this lens, Moquegua is understood as a productive resource for extraction, a source of maize, grapes, copper, and archaeology. We adopt a diachronic and multiscalar perspective that draws on archaeological, bioarchaeological, geochemical, historical, and ethnographic data to explore how Moquegua's inhabitants have represented and utilized their position in these relationships. We consider how connections across space and time were variously established and expressed through economics, cultural practice, craft and culinary traditions, and ritual beliefs. Moving beyond the chronological markers that structure research we explore how intercultural influences have variously endured, been reworked, or been rejected, as multiple generations of Moquegua's inhabitants have defined their affiliations with neighboring communities and distant polities.

Sharratt, Nicola [87] see Goldstein, Paul

Sharratt, Nicola [217] see Muñoz Rojas, Lizette

Sharratt, Nicola [217] see Sutter, Richard

Shaw, Brian [24] see Wiktorowicz, Conner

Shaw, John [88] see Martin, Samuel

**Shaw, Justine (College of the Redwoods)****[82]***After the Apocalypse: Domestic Life in the Late Terminal Classic of the Northern Maya Lowlands*

Although the Coahuah Region of the Northern Maya Lowlands experienced its peak population during the Terminal Classic, by the end of this period a dramatic abandonment took place at every site thus far documented in the region. Most sites were entirely abandoned, although a few retained some occupants as evidenced by both open-fronted (C-shaped) structures and round foundation braces. The temporal relationship between the two architectural forms is not clear, but the latter decidedly reveal a smaller available labor pool and poorer socioeconomic status relative to the occupations associated with the former. Artifact patterning, soil chemistry, ancient starches, and human remains from the foundation braces provide details about domestic life, including an abundance of ceramics and lithics scavenged from abandoned dwellings. At the same time, occupants experienced nutritional stress and lived in constructions that were of a decidedly inferior quality relative to earlier and historic houses. Where such round foundation braces exist, they are sparse and located in what had been residential areas when sites were thriving. Although still ongoing, research seems to indicate relatively few residents trying to survive what must have felt like an apocalypse. Human remains will be shown in this presentation.

**Shaw, Justine (College of the Redwoods)****[82]***Chair***Shaw-Müller, Kyle (University of Toronto), John Walden (Max Planck Institute for Evolutionary Anthropology) and Ran Weiyu (University of Pittsburgh)****[54]***The Greater Rosario Valley, Chiapas: Residential House-Size Inequality among Three Late Terminal Classic Polities of the Southwest Maya Frontier*

The Upper Grijalva Basin, specifically the Greater Rosario Valley in the Chiapas region of Mexico, has been the subject of multiple reconnaissance and excavation projects, due in part to its highland location on the southwestern periphery of the Classic Maya world. Olivier de Montmollin's intensive surveys of the area in 1983, 1988, and 1990 yielded abundant settlement data from the hinterlands of three Maya polities in the region that were largely settled in the Late Terminal Classic period (AD 650–1000). Because of their late foundation as frontier polities that settled on non-Maya (Mizoque) land, Rosario, Ojo de Agua, and Los Encuentros varied significantly, especially in how they were spatially organized. It is likely that differences in socioeconomic status also varied widely between them. Consequently, we calculate Gini coefficients using the combined areas (m<sup>2</sup>) and volumes (m<sup>3</sup>) of residential mounds ( $n = 9,993$ ) for each house-group in the sample, to measure residential house-size inequality at the polity, district, and neighborhood scales. Using these results, we offer interpretations on the varying political strategies of these frontier Maya polities, including methods of district integration and the degree of Mizoque influence on political practices in the valley.

**Sheets, Payson (University of Colorado)****[48]***How Do Sectors of Societies Benefit from Natural Disasters?*

The literature (and of course media) on natural disasters emphasizes the dire effects of death and destruction. Under-researched are the cases where certain sectors of societies benefit, in complex societies but not egalitarian societies. Emphasizing the mid-sixth-century LALIA, the three Maya city states of Tikal, Calakmul, and Caracol are compared, and Teotihuacan is considered.

Scandinavia was barely complex, yet inequality surged as some households profited. Present-day complex societies are particularly prone to setting the stage, where massive sudden stresses provide opportunities for certain sectors to benefit from the disasters.

**Shelley, Nathan (Texas A&M) and Kelly Graf (Texas A&M)**

[31]

*Spatial Analysis of the Late Pleistocene Components at the McDonald Creek Site, Interior Alaska*

The McDonald Creek site (FAI-2043) is located about 30 miles south of Fairbanks, Alaska in the Tanana Flats. Results of archaeological testing and excavations between 2013 and 2021 identified three distinct archaeological components, components 1, 2, and 3 dating to about 13.8 ka, 12.7 ka, and 5 ka, respectively. While excavating a 25-m<sup>2</sup> block, approximately 50,000 pieces of archaeological materials were collected in situ with three-point provenience, and most of these come from the earliest component. The high-density of artifacts and features in the early components at McDonald Creek provides a rare opportunity to gain insight into site use, adaptive strategies, and settlement organization of these early inhabitants of Beringia. For this paper, we will use a series of spatial analyses and modeling methods to better document horizontal spatial clusters in relation to field-identified features to potentially identify activity areas and test questions related to site formation processes. These analyses and models will be completed for components 1 and 2, displaying both 2D and 3D maps of each component separately and in relation to each other.

**Sherfield, Anne (Arizona State University), Ruth Brenton (Arizona State University), Thomas Lobato (Arizona State University), Tatijana Jovanovic (Arizona State University) and Michael Smith (Arizona State University)**

[91]

*Burials and Society at Teotihuacan: Examining Social Differentiation through Residential Burials*

The Burial Project at Arizona State University's Teotihuacan Research Lab is an undergraduate-led project that uses published excavation reports to compile a database of residential burials at Teotihuacan. Currently, this database contains coded information summarizing the context, human remains, and grave goods of 822 burials from 14 published excavations. Preliminary analysis has found that among single burials, where biological sex can be identified, male individuals contain most of the total offerings and the majority of the imports. Additionally, imported goods were concentrated in the Merchant's Barrio (Xocotitla), where 75% of burials contained imports, Tlamimilolpa (57% contained imports), and Oztoyahualco (56% contained imports). We are currently addressing how the wealth and status of burials vary at different scales from individual burials to apartment compounds to the entire city.

Sherman, Simon [30] see Renson, Virginie

**Shev, Gene (Leiden University), Jason Laffoon (Leiden University), Zara Ali (Leiden University) and Corinne Hofman (KITLV/Royal Netherlands Institute of Southeast Asian and Caribbean Studies)**

[166]

*Multi-isotopic Analyses of Hutias from Late Precolumbian Sites (ca. AD 800–1500) in the Dominican Republic: Assessing the Effects of Human Niche Construction Activities and Garden Hunting Practices on Endemic Animals*

Some researchers have long speculated that certain animals found at archaeological sites in the insular Caribbean may have been managed by Indigenous peoples prior to the European invasion of the region. One particular species of endemic rodents known as hutia, *Isolobodon portoricensis*, is a prime candidate for having been managed, and is found prolifically in many archaeological sites throughout Hispaniola, Puerto Rico, and the Virgin Islands. This study examines the isotope ecology of this species, among other endemic species, from four precolumbian sites in the modern-day Dominican Republic. This multi-isotopic investigation also applies Bayesian dietary mixing models to assess the extent of human influence on the diets of these animals. Our findings suggest that the dietary behavior of hutias was influenced by the human inhabitants of the island but does not clearly suggest that there was any systematic management occurring. Likely explanations for this include scavenging from human agricultural produce, or even pet keeping. It is most probable that hutias were subject to pressures created from human niche construction activities, with human farming practices attracting and supporting hutia populations, which in turn were easily trapped and hunted close to human settlements.

**Shield Chief Gover, Carlton (University of Colorado Boulder and Pawnee Nation of Oklahoma)**

[223]

*Stories in Radiocarbon: Dating Indigenous Oral Histories*

Recent advances in computational analysis have provided archaeologists the means to analyze large sums of information covering broad spans of space and time. Bayesian statistical analysis of radiocarbon data has been primarily utilized to refine cultural chronologies and produce greater precision in identifying cultural shifts in the material record. However, this method of producing highly accurate and precise radiocarbon age determinations can be used to provide absolute dating for events recorded in Indigenous traditions. Using information saved in Indigenous oral traditions has long been heavily criticized in archaeological research for the purpose of interpreting the archaeological record. Furthermore, when oral tradition data is utilized, it is largely only mentioned in passing to support the author's interpretations. Indigenous oral traditions should be critically examined, as any other source of information, to provide a greater understanding of the precolumbian Americas. Using case studies that focus on dating Indigenous historical events in the Great Plains, I will demonstrate the validity of Indigenous oral traditions through Bayesian statistical analysis of radiocarbon data.

**Shimada, Izumi (Southern Illinois University) and Paloma Carcedo (University of Lima, Peru)****[29]***Significance of Human Blood and Cinnabar: A New Perspective from the Prehispanic North Coast of Peru*

This paper examines the significance of two substances that are both intensely red, human blood and cinnabar. Based on the recent documentation of an unexpected Middle Sicán usage of human blood using proteomic analysis and an iconographic study of a rare Moche sculptural copper object, we offer a new perspective on prehispanic north coast symbolism. From the first millennium BCE, the use of cinnabar paint was restricted to ritual and elite mortuary contexts, for example, to paint part or much of the skeleton and grave goods accompanying the dead. What was the intent of this practice? Our recent proteomic analysis vis mass spectroscopy of a sample of the cinnabar paint on a Middle Sicán gold mask revealed human blood was a major organic binder, providing support of our hypothesis that cinnabar paint symbolized durable vital force necessary for rebirth or successful journey to another world. The concept of transmittable or absorbable vital force may have already existed in the Moche culture. The "Presentation Theme" in Moche art is well-known, but a rare Moche copper scepter shows a sculptural representation of two individuals drinking blood from freshly decapitated heads while the victims lay at their feet.

Shipton, Ceri [120] see O'Connor, Sue

**Shiratori, Yuko (Kyoto University of Foreign Studies)****[130]***Economic Inequality at Colonial Frontier: The Sixteenth- to Eighteenth-Century Maya in the Petén Lakes Region, Guatemala*

The Spanish conquest of Central America was not an event that occurred in the early sixteenth century but instead a process that played out across nearly 200 years, culminating in the 1697 defeat of the Itzá Maya of the Petén Lakes Region of what is today northern Guatemala. The outer edges of this region served as a frontier for nearly 200 years, marking the boundary between colonized and uncolonized towns and serving as a place of interaction. The Itzá Maya were active participants in this frontier, seeking out interaction with other Indigenous groups and Spaniards alike while persisting in their lives and thriving in unconquered communities. They did not envision themselves as living in a frontier zone, but rather in their homeland amid a shifting set of circumstances. Building on the concept of "survival" and its implications for continuity and active resistance to domination, this paper analyzes archaeological materials from this time period to address the ways in which the colonial frontier generated differences in equality within and between communities.

Shiung, Chung-Ching [78] see Kirk, Scott

Short, Laura [24] see Maldonado, Amanda

Shott, Mike [83] see Nolan, Kevin

**Shugar, Aaron (Buffalo State College) and Laure Dussubieux (Field Museum)****[132]***Reassessing Byzantine Glass Tesserae from Beit Shean, Israel*

It has been over 20 years since the first assessment of Byzantine red glass tesserae from Beit Shean, Israel. A reassessment of those previous analyses was recently undertaken by laser ablation-inductive coupled plasma spectroscopy (LA-ICP). The data was compiled to reestablish the previous finding and compare the original data derived from X-ray fluorescence spectroscopy (XRF) using the newer and more sensitive technique of LA-ICP. In addition to the red tesserae, blue and yellow tesserae were also analyzed to see if their base compositions revealed similar results to those of the red tesserae.

Shuler, Kristina A. [69] see Rosenberg, Ciele

**Sieg, Lauren (National Museum of the American Indian)****[1]***Moderator***[75]***Discussant***Siegel, Peter, Philip Riris (Bournemouth University) and S. Yoshi Maezumi (University of Amsterdam)****[120]***Population and Colonization Dynamics in the Precolumbian Caribbean*

The Caribbean archipelago was the last region of the New World to be colonized by Native Americans and the first to be occupied by Europeans. Between ca. 8000 BP and the arrival of Europeans (ca. 500 BP), numerous colonization events occurred in the region. Once established in the islands, groups of people moved through portions of the archipelago and back to mainland areas continuously throughout precolumbian history, which continued into the historical colonial era. The dynamics of population dispersals and colonization in the precolumbian Caribbean must be addressed in the context of social, political, economic, ecological, and climatological parameters at any given time in history. In this paper, radiocarbon, archaeological,

paleoenvironmental, and paleoclimatological records will be assessed in modeling dispersal and colonization processes in the precolumbian Caribbean. Consistent with dispersal models in ecology, data for the first colonizers to the Caribbean reveal a slow pioneer phase, rapid exponential growth, and flattening out as carrying capacity is reached. Processes of landscape modification are linked to initial and subsequent colonization events and shifting survival strategies and sociocultural patterns, ranging from mobile bands of Archaic hunter-gatherers-foragers-fishers / incipient horticulturalists to larger Neolithic communities following mixed economies of farming, fishing, collecting, and hunting.

**Sievert, April (Indiana University), Brian Gilley (Indiana University), Teresa Nichols (Indiana University), K Anne Pyburn (Indiana University) and Jayne-Leigh Thomas (Indiana University)**  
[159]

*Learning NAGPRA: Online Tools and Resources for Teaching and Learning*

Learning NAGPRA is a multiyear National Science Foundation-funded project that combines the work of over 50 Indigenous and non-Indigenous scholars in developing resources for college teachers, museums, cultural resource managers, and students, and presenting them online for open access. The Learning NAGPRA website includes two curriculum models—one exploring Indigenous worldviews and how NAGPRA works in context. Also included are accessible case studies, a webinar, and an online course directed to cultural resources managers and members of RPA. Funding through the NSF for this project supported survey and interview research, consultation, and collaboration with NAGPRA professionals and educators across the continent.

Sigona, Alexii [141] see Sanchez, Gabriel

**Silliman, Stephen (University of Massachusetts Boston)**  
[121]

*Lightfoot Living: Practicing Humility, Care, and Collaboration in Archaeology*

With Kent Lightfoot as my dissertation advisor in the 1990s, I was guided to practice theory and how to develop my own applications of it; trained in studies of culture contact and colonialism and how to think critically about them; introduced to collaborative archaeology with Indigenous communities and encouraged to find my own way; and shown a model for how to work on issues that matter locally but that always can be turned to larger anthropological scopes. My tendency to cite him frequently make those intellectual legacies crystal clear. Here, though, I want to honor the Lightfoot legacy by focusing on how he modeled humility, listening, patience, and care in his approach to inclusivity, collaboration, and teaching. I have aspired, but undoubtedly fallen short, to embody those qualities in my own archaeological and educational practice. These elements are not what he normally writes about and might be somewhat subtle in his published work, but they are how he practices his craft and inspires those around him.

**Silliman, Stephen (University of Massachusetts Boston)**  
[121]  
*Chair*

Sills, E. Cory [154] see McKillop, Heather

**Silva, Fabiola (University of São Paulo)**  
[25]

*Indigenous Narratives and Colonialism Archaeology*

Indigenous peoples in the Americas are constantly affected by predatory and colonialist economic policies that negatively affect their lifeways and territories. This presentation addresses this issue, using as an example collaborative archaeological research with the Asurini do Xingu in Amazonia, Brazil. The objective is to show how these Indigenous people have appropriated archaeological research a means of materializing memory and experiencing narratives (historical, autobiographical, and mythical) about their cultural trajectory, and as a tool of resistance to guarantee the maintenance of their lifeway and territory. The text also seeks to reveal that conducting an archaeological study while considering Indigenous narratives allows us to understand other historicities, thus decolonizing archaeological thought about Indigenous histories.

**Silva, Fabiola (Ft. Bliss DPW-E)**  
[118]

*A Pair of "Cool-ito" Scholars: An Appreciation of Michael E. Whalen and Paul E. Minnis*

Paul E. Minnis and Michael E. Whalen have produced numerous contributions to our understanding of the prehistory of Northwest Mexico and the US southern Southwest. Their dedication and respect for the discipline have transcended political borders, and those of us who have had the pleasure of working with them are better for it. Michael E. Whalen's work on Ft. Bliss became the basis for understanding subsistence and settlement patterns of the Jornada Mogollon region. Paul E. Minnis's mentorship inspired me to look beyond political boundaries and flesh out the relationship between two countries and the archaeological record. Minnis and Whalen's boldness to leave conventional SW archaeology challenged previous interpretations of the Casas Grandes region and promoted binational collaboration. Their body of work will continue to inspire Mexican and US scholars alike.

**Silva, Jorge (Universidad Nacional Mayor de San Marcos) and Cecilia Ysabel Jaime Tello (Universidad Nacional Mayor de San Marcos)****[192]***The Huacoy Architectural Complex and Its Political Significance in the Chillón Valley, Central Coast of Peru, during the Formative Period*

Since the 1950s, many publications have appeared on the Formative period of the central coast of Peru, particularly with reference to pottery chronologies from the domestic settlements of Ancón, Chira-Villa, and Curayacu on the coast. These site chronologies allowed the construction of a prolonged cultural sequence that begins with evidence of the first inhabitants arriving in this part of the Peruvian coast. In the 1960s and 1970s, studies were conducted in the monumental Formative period settlements of La Florida and Garagay in Rímac, Huacoy in El Chillón, and Mina Perdida, among others, in the Lurín valley. As for the Chillón valley, our studies have identified several architectural complexes with different dimensions and designs distributed in the lower and middle valley, having excavated Pucará in the chaupiyunga, and Huacoy in the lower valley. Excavations in the latter revealed relevant data to support its political role in the Ancón-Chillón area and its links with the neighboring Rímac valley.

Silva Noelli, Francisco [35] see Sallum, Marianne

Silverhorn, Talon [196] see Everhart, Timothy

**Silverman, Helaine (University Of Illinois)****[192]***The Inca in the Plaza*

"Affiliative reterritorialization" was eagerly sought 100 years ago by the Japanese immigrant community in Peru. For the celebration of the centenary of Peru's independence, the colonia japonesa decided to give a great gift to their new country: a grand statue of Manco Capac, mythical founder of the Inca Empire. With this statue the colonia japonesa made the heritage argument that just as Japan and the Incas were "empires of the sun" so they—new immigrants—had a rooted place in Peru. Placing the monument was not as easy as fabricating it—withstanding delays in manufacture. Space and politics in Lima had to be negotiated. Nor did the monument remain in its original location. The mobile history of the gift of the colonia japonesa reveals the challenge of immigrants to establish themselves in a host nation, the manipulation of public art by competing sectors, political intrigue, and municipal aspirations for urban regeneration and social renewal.

**Silverstein, Jay (University of Tyumen), Robert Littman (University of Hawai'i) and AbdelRahman Medhat (Grand Egyptian Museum)****[106]***Cleopatra VII and the Fragrance Industry at Ptolemaic Tell Timai, Egypt*

The discovery of an unguent factory in the Mendesian heartland of the Nile Delta provides revelations about the manufacture of fragrances. The Mendesian nome was renowned throughout the ancient world for the manufacture of the most desired ancient perfume, and this data provides archaeological correlates to the historical accounts. Detailed archaeometric analysis of residues confirms the identification of the factory and provides an unprecedented analysis of the manufacturing process. The discovery of this industry elucidates aspects of Hellenistic imperialism and Greek entrepreneurship in a traditional and sacred Egyptian industry.

Simek, Jan [102] see Schaefer, Jordan

**Simmons, Alan (University of Nevada—Las Vegas and Desert Research Institute, Reno) and Renee Kolvet (Independent Researcher)****[226]***At Home in a Small Upland Cypriot Neolithic Settlement*

Much Neolithic research attention has focused on permanent villages. These, and domesticated resources, are iconic images of this transformative period. In Cyprus, we now know that the Neolithic was as early as on the mainland, and here we examine Ais Giorkis, a small Neolithic settlement. In contrast to presumably permanent and larger villages, which usually are coastal, Ais Giorkis is a rare upland site located in a rich ecotone. Its small size, however, belies its significance. It was unique not only in the abundance of material remains (including among the largest lithic and faunal assemblages on the island) but also its diversity of activities. While probably not occupied year-round, it was a complex settlement, and here we discuss what likely were some of the daily activities of its residents. They hunted wild animals, had domestic animals and plants, were possibly involved in timbering activities, and had knowledge of traditional ethnomedicines, including Caryophyllaceae, known for its antiviral, antibacterial, and anti-inflammatory properties and used in modern cancer research. Other evidence also suggests feasting activities. Ais Giorkis is an example of a colonization strategy of a "new space" (i.e., an island) that shows the complexity and sophistication of early Cypriots.

**Simon, Rebecca (History Colorado—OAHP)****[190]***"PAAC Tales": The Past, Present, and (Hopefully) Future of the Program for Avocational Archaeological Certification*

Since 2016, the stability and consistency of the Office of Archaeology and Historic Preservation's (OAHP) archaeology education and outreach efforts have been less than ideal. Many groups engaged in such efforts are in the same boat because of the pandemic. The Program for Avocational Archaeological Certification (PAAC) is OAHP's educational program specifically for

avocational and professional archaeologists. The program facilitates public service and the protection of archaeological resources in Colorado through education, research, and on-the-ground management. Typically, PAAC includes in-person classes, laboratory work, and fieldwork. A constant rotation of issues, including the pandemic, forced moving aspects of the program online and a major reflection on PAAC's future and place in ongoing efforts to protect and respect the past.

**Simonsen Bendtsen, Aka, Christian Madsen, Michael Nielsen and Birte Olsen**

[33]

*White Fang Traps: Archaeological Analyses of Carnivore Traps in Greenland*

From the deserts of Africa to the Greenlandic tundra, carnivores have been both threats and competitors to humans for food resources throughout history. Consequently, humans established pest control to counter carnivore threats, save time and energy of encounter-hunting, and satisfy economic interests. Research is done by reading archaeology reports, other historical texts, arctic expedition books, archaeological fieldwork by combining co-production with locals and looking at Greenlandic place names. It resulted in finding three types of carnivore traps in Greenland (pullatit- chamber-, perisiniutit- stonefall-, ullisaatit- tower traps). Typology and chronology analysis of the traps shows different cultures built same type traps, but in a different way. Moreover, traps can be species-specific, however the larger traps are for all living carnivores at the place, but also birds and other animals could get trapped in. Sturdiness of the structure shows if the trapper comes from a nomadic or stationary culture. The patterns of location of the trap show the trappers had extended understanding of animal behavior. Finding traps, you know there will be a settlement "nearby," and distance to the settlements shows mobility of the culture in their daily life. Further research could follow patterns of cultural migration through continents.

Simonsen Bendtsen, Aka [33] see Madsen, Christian

**Simón-Vallejo, María (Universidad de Sevilla), Miguel Cortés-Sánchez (Universidad de Sevilla), Rubén Parrilla-Giráldez (Universidad de Sevilla), João Cascalheira (ICArEHB, Universidade do Algarve) and Nuno Bicho (ICArEHB, Universidade do Algarve)**

[98]

*Portable Art of the Vale Boi Site (Algarve, Portugal), in the Context of the Paleolithic Art of the South of the Iberian Peninsula*

The Vale Boi site is one of the sites with the most extensive prehistoric stratigraphic sequences in the south of the Iberian Peninsula. In this geographical area, it is one of the few sites that provide examples of portable art in a stratigraphic context. However, more than 100 lithic elements have been analyzed that can contain some graphic evidence, among which we have detected four with evidence of artistic inscriptions. These are decorated plaquettes dating to the Solutrean and have been studied in detail. Vale Boi is, thus, the site that provides more engraved pieces in the region for this phase. Since we are in the process of reviewing the numerous documented lithic and bone supports it is possible that the collection of portable art from Vale Boi is not yet fully identified and more pieces may be found. The importance of the Vale Boi art lies in the fact that it provides a solid stratigraphic and chronological basis for establishing parallels with Iberian rock art.

**Simpson, Duane (Cardno)**

[137]

*Discussant*

**Sinclair, Anthony (University of Liverpool, UK)**

[159]

*The Atlas of Archaeology: Mapping the History of a Discipline Using Bibliometric Data*

Archaeology, like most academic disciplines has experienced a quasi-exponential growth in the number of research publications produced with a doubling in total number approximately every 15 years. As each year passes, therefore, it becomes more difficult to understand the shape and growth of the discipline as a whole, or to understand the development of certain key specialties through the process of reading alone. This is a particular problem for new scholars in the field. There are, however, other approaches that can help: one such approach is bibliometric analysis. Bibliometric data describes documents through information such as authorship, source, references, key words, and so forth. The process of citation then creates links between documents and generates networks among the bibliometric data fields. Data going back 50 years is now readily accessible through online data sources such as Scopus and the Web of Science. This paper will demonstrate how bibliometric data can be used to visualize and explore the history of anthropology since 1960, and identify key themes of research and methodological development. It will also introduce a new bibliometric research project for our discipline—the Atlas of Archaeology.

**Sinensky, R. J. (University of California Los Angeles)**

[22]

*The Agroecology of Early Farmers on the Southwestern Colorado Plateau*

The AD 250–550 interval brought important changes to the Ancestral Pueblo world as farmers adopted a wide range of new domesticates and technologies—events that set the stage for explosive population growth and dramatic social change during the late sixth and seventh centuries AD. Throughout this interval, however, farming communities experienced prolonged and persistent drought-like conditions. It is therefore surprising that the far southwestern Colorado Plateau, a notably dry region, experienced a dramatic population boom at this time. Drawing on paleoethnobotanical analyses and survey settlement data, this research investigates how early farmers on the southwestern Plateau were able to thrive during a period of acute environmental stress.

Sioui, Linda [223] see Birch, Jennifer

**Sitek, Matthew (University of California, San Diego / St. Cloud State University)**  
[217]

*Moquegua, a Tiwanaku Hub: Better Understanding Tiwanaku's Multimodal Community Network in the Valles Occidentales*

Tiwanaku's presence in the middle Osmore Valley (Moquegua) has been well established, but what about the rest of the coastal valleys of southern Peru and northern Chile that collectively make up the Valles Occidentales? This paper reviews recent findings from the Locumba Valley, just south of the Osmore, to further delineate Tiwanaku's presence in the region. Relying on data largely collected from domestic contexts, I draw connections between the well-studied middle Osmore Valley Tiwanaku settlements to the more recently investigated settlement complex at Cerro San Antonio in the middle Locumba Valley. While a large Tiwanaku settlement in Locumba shows that the Osmore settlement was not isolated, it does far from diminish the role of this large Tiwanaku enclave. I utilize a network perspective to illustrate how the Valles Occidentales may have been articulated at various times during the Middle Horizon. Under almost any likely configuration, the Moquegua node played a central role in the western frontier network of Tiwanaku.

**Skaggs, Sheldon (Bronx Community College CUNY), Adam King (University of South Carolina), Christina Luke (Boston University), Nilesh Gaikwad (University of California, Davis) and Terry Powis (Kennesaw State University)**

[89]

*Ritual Drinks in an Ulúa Vase from the Ancient Maya City of Pacbitun, Belize*

In this paper we use absorbed residues to explore the contents of an Ulúa-style vase found in a royal courtyard at the ancient Maya site of Pacbitun in west-central Belize. Those results indicate the vase once held concoctions containing caffeine, alcohol, and an emphyatogenic ingredient contributed by the bark of the tree *Lonchocarpus violaceus*. That bark is used to make the fermented ritual drink balché important to the ancient Maya and Mayan speakers of Central America of today. While use of the drink is recorded in sixteenth-century Spanish accounts and earlier Maya texts, direct evidence for the use of balché has never before been found in an archaeological context. By placing the vase and its contents in the history of Pacbitun we argue both played an important role in place-making and dedicatory rituals at key points in that history, and that the ultimate disposition of the vase suggests those efforts were intentionally undone as the rule of kings ended.

Skaggs, Sheldon [153] see Powis, Terry

**Skinner, Dougless (University of Alaska Fairbanks), Whitney McLaren (Center for Environmental Management of Military Lands), Barrett Flynn (Center for Environmental Management of Military Lands) and Julie Esdale (Center for Environmental Management of Military Lands)**

[56]

*Modern and Prehistoric Land-Use Patterns in Donnelly Training Area, Alaska*

Interior Alaska's Fort Wainwright Cantonment and its associated training lands contain 720 known archaeological sites, one traditional cultural property, and six archaeological districts. Archaeological sites range from small, single component surface sites to deeply stratified, multicomponent Pleistocene sites. Additionally, military activities, development, and recreation regularly take place in and around some of the shallowly buried archaeological sites. For this case study, we take a subset of archaeological sites from Donnelly Training Area and use GIS methods to examine the success rate of archaeological survey and Phase II testing, analyze the relationships between sites and land use, and explore the intersection of modern activities with inferred prehistoric ones. GIS modeling based on terrain features, vegetation, and proximity to water coupled with archaeological assemblage characteristics has implications for prehistoric subsistence practices and technological organization. Results from these analyses will aid in the interpretation of the lifestyles of early Alaskans with better management and protection of archaeological sites on active training lands.

**Skinner, Jessica (Mayo Clinic), Patricia Richards (University of Wisconsin–Milwaukee) and John Richards (University of Wisconsin)**

[178]

*The Suture: Medical Entanglements at the Milwaukee County Poor Farm Cemetery*

Amid the incidental objects that shape everyday life, medical devices and implants stand out as artifacts that are so integral as to be subsumed within the body entirely yet reach beyond the individual to the world at large. These sweeping entanglements span both space and time, extending beyond the individual to encapsulate institutional activity, medical practice, and commerce. Analysis of medical devices recovered from the excavated burials at the Milwaukee County Poor Farm Cemetery has helped to refine temporal estimates of site use and explicate medical conditions and experiences. These objects, as both material culture and body, bolster potential identifications and foster personal connections to the individuals interred at the cemetery. Utilizing mortuary and material culture analysis, medical records, portable X-ray fluorescence, and historic documentation, this paper explores the influence of these composite objects on the individual, the community, and the researcher.

Skipton, Tara [46] see Hollingshead, Analise

**Skosey-LaLonde, Elena (University of Connecticut; ICAREHB), Ana Gomes (ICAREHB, Universidade do Algarve), Mussa Raja (Eduardo Mondlane University), Roxane Matias (ICAREHB, Universidade do Algarve) and Nuno Bicho (ICAREHB, Universidade do Algarve)**

[186]

*Modern and Paleoenvironmental Conditions of the Inhambane Bay Mangroves in Iron Age Southern Mozambique*

In 2016 a geoarchaeological survey, funded by FCT (Portuguese Science Foundation), was conducted to classify Holocene environmental variability in southern Mozambique, and its impact on patterns of human land-use and settlement. Twenty-three sediment samples were collected across various environments including the Inhambane coastal mangroves. Sampled sites were georeferenced, and surface and core samples, dating over the last 4,700 years, underwent multiproxy analyses. Results of the diatom analysis suggest that environmental changes in Inhambane are related to the bay lateral progradation, after the mean sea-level stabilization. Moreover, diatoms species preservation and biodiversity point to the occurrence of wetter conditions at ca. 4500–4700, 2500–3000, 1000–1500 years cal BP. In 2019, the InMoz project (also funded by FCT) returned to the coast to core for high-resolution paleoenvironmental and climatic data in association with the local, and contemporaneously occupied, Iron Age sites of Praia da Rocha and Praia do Tofo. This paper presents the background borehole and diatom data for the modern and recent past, as well as novel radiocarbon dates, CHN analysis, gastropod biodiversity data, and  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  stable isotope reconstruction of the climatic conditions of coastal life during the Iron Age in southern Mozambique.

**Skousen, Jacob (Illinois State Archaeological Survey)**

[15]

*Chair*

**Slade, Alan (University of Texas)**

[116]

*Clovis Points in Texas: A Further Update to the TCFPS*

In 1985, Dr. David Meltzer initiated a survey of Clovis fluted points in Texas. That survey continues to the present, and as of 2007 when the 3rd edition of the survey was published, there were over 544 Clovis fluted points recorded by the Texas Clovis Fluted Point Survey (TCFPS). Clovis fluted points occur throughout the state, with concentrations on the High Plains, Coast, and along an arc through Central Texas following the Balcones Escarpment along which high-quality chert and freshwater sources were readily available. The majority of Texas Clovis fluted points were made of varieties Edwards Plateau chert from Central Texas, along with Alibates agatized dolomite and Tecovas jasper from the High Plains. This presentation will introduce the 4th TCFPS that is now based at the Texas Archeological Research Laboratory (TARL) in Austin, Texas. It is anticipated that the number of Clovis fluted points from Texas will be significantly increased, as will the number of counties from where the points were reported. Finally, there will be a request for information on more Clovis fluted points that can be added and how to go about providing that information.

Slade, Alan [116] see Wernecke, D. Clark

**Slaughter, Mark (Bureau of Reclamation)**

[7]

*Discussant*

**Sload, Rebecca**

[177]

*Beyond Chicomoztocs: Are Hill Sign Toponyms Actually Mountain-Caves?*

Among the ancient central Mexican highland cultures of the Aztec, Mixtec, and Zapotec the hill sign toponym was an important standardized definition of place. The hill sign itself was a constant that was embellished with one or more glyphs characterizing the place. Chicomoztocs, one type of hill sign toponym, have been recognized for decades as mountain-caves. Referring to the seven caves from which emerged the seven major central Mexican groups, Chicomoztocs are hill signs embellished with seven caves. This presentation raises the question of whether many, perhaps all, hill sign toponyms are in fact mountain-caves. I illustrate the possibility with examples of non-Chicomoztoc hill sign toponyms that are clearly mountain-caves. The argument is bolstered by the eternalness and centrality of the mountain-cave in ancient Mesoamerican cosmology. The analysis suggests that hill sign toponyms may be more accurately labeled mountain-cave toponyms.

**Slotten, Venicia (University of California, Berkeley)**

[125]

*Food and Resources in Ancient Arenal, Costa Rica: Resilience at G-995 La Chiripa*

Archaeological work has shown that people have been living within the Arenal region of Costa Rica for several thousand years, demonstrating their impressive ability to adapt to life in a volcanically active landscape. Paleoethnobotanical analysis at G-995 La Chiripa, a domestic structure dating to 1450 BCE, reveals what subsistence and resource procurement strategies Indigenous peoples incorporated into their daily lives in order to thrive in an ever-changing volcanic landscape. Macrobotanical samples collected from multiple cultural strata at the site (700 CE–1450 BCE), record the human-environmental interactions that contributed toward the longevity of cultural practices in this region. Identified macrobotanical remains include maize, beans, tobacco, passion flower, geophytes such as manioc, and over 1,000 specimen of wood charcoal remains representing more than 40 genera, including most notably palms, cacao, ceiba, dogwood, hogplum, jacaranda, and mahogany.

**Slovak, Nicole (Santa Rosa Junior College)****[12]***Yes, There Is a Doctor in the House: Community College, Archaeology, and a History of Exclusion*

Community colleges represent a robust component of the American education system, with thousands of instructors working at 2-year institutions and millions of students—many of whom are low-income and from historically underrepresented groups—enrolling in them annually. Despite their obvious importance, community college faculty and students often are overshadowed by their 4-year counterparts. Through the lens of archaeology, this paper will explore the subtle and not-so-subtle ways in which community college faculty and students have been, and continue to be, excluded from academic discourse and practice by funding institutions, professional organizations, and academic journals. Classist and elitist attitudes toward community college faculty by colleagues at 4-year colleges and universities as well as a dearth of preparation for, and discouragement of, graduate students looking to pursue a career in archaeology at 2-year institutions will be examined. If archaeology is to become a more inclusive discipline, then its practitioners must confront their own biases about two-year institutions and develop strategies for increased collaboration, equity, and outreach with and for community college faculty and students.

**Smallwood, Ashley (University of Louisville), Thomas Jennings (University of Louisville), Jacob Ray (University of Louisville), Charlotte Pevny (SEARCH Inc.) and Shaylee Scott (University of Louisville)****[117]***Early Holocene Hunter-Gatherers in the Lower Ohio River Valley*

Early Holocene hunter-gatherers in the Lower Ohio River Valley were organized as small, highly mobile bands. Exploitation of chert types by Kirk point makers suggests territorial ranges were increasingly more restricted than earlier Paleoindian populations. Access to stone sources was more restricted, yet bands still keyed in on higher-quality stone resources within home ranges. While much of the archaeological record in the river valley represents ephemeral base camps, some sites show evidence of repeated use, perhaps indicating that these were places on the landscape where multiple Early Archaic bands seasonally aggregated. This poster explores patterns of hunter-gatherer landscape use and technological organization in stone tool assemblages from the Lower Ohio River Valley. Using GIS, technological, and use-wear analysis, we study the evidence for task distribution and social interaction at Early Archaic sites across the landscape.

Smallwood, Ashley [97] see Jennings, Thomas

**Smeeks, Jessica (Binghamton University)****[29]***Sensory Awareness as a First Line of Defense: Viewshed and Line-of-Sight Analyses of Late Intermediate Period Sites in Ayacucho, Peru*

In defensive systems, the ability to detect the enemy's positions and progressions across the landscape must be effective, as defenders would not want attackers to sneak up on them. Thus, in times of conflict, communities tend to select settlement locations that allow for visual dominance over the surrounding landscape. They also commonly form networks of sensory connection with allied groups, so they can alert one another of advancing attackers and/or gather reinforcements for resistance. Visual alertness becomes a first line of defense. Assessing this form of "natural" defensibility, this paper presents the final results of viewshed and line-of-sight analyses carried out on Late Intermediate period (LIP; AD 1000–1450) sites in Ayacucho, Peru. During this period, populations across the highlands were moving away from the fertile flatlands to settle on hilltops and ridges. Many scholars point to strategic defense as a cause of this shift, suggesting increased sensory awareness and reduced accessibility were significant factors in determining new settlement locations. To test this interpretation, this paper evaluates regional patterns of sensory awareness and employs comparative statistical analyses to determine if LIP Ayacucho sites have significantly better viewsheds and a higher degree of inter-visibility than other available locations.

**Smeeks, Jessica (Binghamton University)****[29]***Chair***Smit, Douglas (University of Pennsylvania), Michelle Young (Vanderbilt University) and Emily Kaplan (National Museum of the American Indian)****[155]***Cinnabar Semiotics in the Prehispanic and Early Colonial Andes*

From paint found on the Peruvian North Coast during the early second millennium BCE (Prieto et al. 2016), to the vibrantly decorated keros produced during the colonial period (Kaplan et al. 2012), cinnabar (HgS) has been sought after and employed as a pigment by Andean peoples for millennia. Geological and historical research indicate a limited number of sources for cinnabar, suggesting that perhaps cinnabar's value lay not only in its bright vermilion color, but also in the long distances required for its procurement (e.g., Helms 1993). In this paper, we explore the semiotics and materiality of cinnabar used to decorate museum objects in the collections of the Penn Museum of Anthropology and Archaeology and the National Museum of the American Indian to elucidate how cinnabar's value and meaning changed in the Andes through time. Employing X-ray fluorescence and microscopy, we note how and in what instances Andean peoples selected cinnabar to produce particular shades of red over more common sources of red mineral pigment such as hematite. By comparing the types of objects that display cinnabar and how cinnabar was deployed in Andean contexts, we gain more insight into the importance and meaning of this valued exchange material.

**Smith, Alexander (SUNY Brockport), Amalia Pérez-Juez (Boston University), Paul Goldberg (Boston University and University of Tübingen), Kathleen Forste (Boston University) and Emma Wagner (North Carolina State University)**  
[108]

*Excavations at Torre d'en Galmés, Menorca (Spain): Results from the First Two Seasons of the Menorca Archaeological Project*  
The Menorca Archaeological Project (MAP) is an international collaboration focused on a diachronic investigation of the Balearic Island of Menorca, building off of Boston University's presence on the island since 2001. Menorca is known for its megalithic, Iron Age remains of the Talayotic Culture, but the island exhibited many different cultural horizons and colonial influences. The goal of MAP is to try to understand all of this rich history through complex, multi-period sites. MAP excavates and investigates all periods, but emphasizes those that have not been systematically explored. Over the past two seasons, the team focused on the medieval, Islamic remains of the site of Torre d'en Galmés, excavating portions of two large compounds on the site, including two buildings and a cistern. Torre d'en Galmés was home to a significant Islamic community, embedded in the remains of one of the largest Iron Age sites in the Balearic Islands. This paper will focus on the excavations of 2020–2021, showing that by excavating this medieval settlement atop a better-studied Iron Age village, the project was able to learn more about both periods. We will describe the project's methodology, along with the goals for MAP at Torre d'en Galmés in 2022.

Smith, Alexander [108] see Forste, Kathleen

**Smith, Benjamin (University of Florida), Abebe Taffere (University of Florida) and Steven Brandt (University of Florida)**  
[76]

*Place, Practice, and Stone: A Study of Change and Continuity in Lithic Material Procurement and Core Reduction at Mochena Borago Rockshelter, Ethiopia*

Patterns of lithic technological variation in the Horn of Africa, a posited origin for our species' dispersal out of Africa ~70–50 ka, do not match other regions of the continent where the search for typo-technological transitions in contexts of environmental change has dominated the literature. Consequently, the social processes underlying technological change during this period of significant social and behavioral evolution remain poorly understood. In this paper we examine social and ecological explanations of technological variation through a study of core reduction and toolstone procurement at Mochena Borago Rockshelter, SW Ethiopia. Results show continuous use of local obsidian and certain reduction systems (e.g., "Levallois") across a >50 ka occupation span, but shifts in core reduction intensity. This suggests a complex relationship between site and source. After discussing this relationship, we conclude by rejecting essentialist industrial models of technological change, highlighting deep histories of material engagement that likely formed between people and places.

Smith, Benjamin [76] see Taffere, Abebe

**Smith, Cassandra**

[55]

*Figurative Representations in the Pottery Mound Murals: Beyond Portraiture?*

In the published record of Pueblo IV mural imagery, the distribution of figurative paintings at Pottery Mound far exceeds that of other sites. Figures at Pottery Mound are variously idealized, recognizable, anthropomorphic, zoomorphic, composite, and/or supernatural. Overwhelmingly, they are visibly gendered, featuring attributes associated with male, female, and non-binary genders. I propose that the diverse gendering of murals at Pottery Mound is one of several such compelling figurative attributes that gesture, more broadly, toward the performative role of kiva paintings in a Puebloan life world. Effigial, intermedial, temporal, and theatrical elements of the figurative paintings at Pottery Mound perform as transformational metaphors, often utilizing elements of play and surprise. A kiva painting—figurative or otherwise—is a performer, one among many in a complex ensemble forever reenacting itself, not only on the walls of the kiva, but throughout the village, the broader cultural landscape and, indeed, the universe. How might an art-historical concept of portraiture correspond to such performative figurative representations? What does it mean when the power embodied within and enacted by figural depictions exceeds that of representation per se?

**Smith, Charles**

[81]

*How One Archaeologist Went from Fieldwork to Collections Management, the Iraq War, Viet Nam, Carlisle Indian School, and in the Process Preserved, Protected, and Educated*

The 48-year career of Dr. Trimble is a sterling example of how an archaeologist, who began his career doing fieldwork, lithic analysis, curation, and archives work, became a leader and innovator in the field and in the Federal government. He transformed the US Army Corps of Engineers, other Federal agencies, the archaeological profession, and our Nation's community of Veterans. The first half of his career consisted of fieldwork and publications, the kind of experience he would go on to apply to developing and implementing new ideas and programs for the management of the massive archaeological collections and documents held by the Corps and DoD. He established a Center of Expertise for curation/collections management, conducted several seasons of fieldwork on mass graves in Iraq, brought home the remains of Veterans from Viet Nam, and ensured that the Corps met its NAGPRA responsibilities. He established the USACE Veterans Curation Program, and helped lead several seasons of dis-interment and repatriation work at the Carlisle Indian School, PA. Dr. Trimble's dedication, tenacity, and creativity at key points in his career resulted in the preservation, protection, and education of professionals and the public in unparalleled fashion.

**Smith, Charles**

[81]

*Discussant*

**Smith, Erin (Washington State University, Pullman) and Colin Grier (Washington State University, Vancouver)****[131]***Shell-bearing Deposits as Landscapes, Relations, and Histories: A Salish Sea Archaeological Perspective*

Shell-bearing deposits in the Salish Sea typically contain fine-grained stratigraphy and discrete features generated by individual events interlaced with large-scale singular depositional moments. This situation provides a window into both the quotidian and monumental practices in the past. When viewed in aggregate across a seascape, such places also represent a complex network of physical and historical connections, making material the network of places occupied by ancestors since time immemorial and imprinting histories and relations on the world. Adopting such a framework allows the integration of varying scales of formal analysis of shell deposits that reveal (a) micro to macro scales of local action, (b) variation in practices across horizontal and vertical space, and (c) temporal variation among intersecting scales of history. In this sense shell accumulations are compressed worlds, encoding past and ongoing practices in complex but ultimately discernible ways. Salish Sea archaeologists have been adept at the technical analyses that necessarily underpin such inquiry, but less ambitious in developing holistic interpretive frameworks. We attempt to advance the latter through several examples of querying Salish Sea shell bearing sites.

Smith, Geoffrey [57] see Kingrey, Haden

**Smith, Heather (Texas State University) and Kelly Graf (Texas A&M University)****[120]***Colonizing Siberia and Beringia: Uncharted Territory for Humans Dispersing into the Far North*

Initial human colonization of Siberia and Beringia was inextricably linked to climatic conditions that allowed humans to occupy areas north of 50 degrees latitude during the early Upper Paleolithic. Early Siberian groups then responded to a series of environmental reorganization events that occurred during the most recent glacial intervals, resulting in abandonment and reoccupation of high latitudes, new technologies, and genetic founder effects and bottlenecks. These events set the stage for dispersal into Beringia and, ultimately, North America. This paper will review the genetics, technology, subsistence, and paleoecology behind these colonization events, assess the factors likely to have driven such dispersals, and suggest future steps to further evaluate the model.

**Smith, Jaye and Jeffery Clark (Archaeology Southwest)****[5]***Continued Work on the Ray Robinson Collection: The Elmer's Farm and Layton Field Sites in the Safford Basin, Arizona*

In 2015, centenarian Ray Robinson wanted to find a permanent home for thousands of artifacts he collected from numerous sites in the Safford Basin, Arizona during the late 1950s and 1960s. Through a collaborative effort between Archaeology Southwest, Northern Arizona University and the Arizona State Museum (ASM), Ray's desire was realized shortly before his death. Archaeology Southwest's Robinson Collection Project volunteers continue to inventory and conduct preliminary research on the collection. During lab sessions conducted since 2018, artifact assemblages from the Elmer's Farm and Layton Field sites in the eastern Safford Basin were studied, and prepared for repository storage and future research. Both sites were Salado settlements that date to the late prehispanic period (1200–1450 CE). Elmer's Farm was visited by Robinson from 1956 through 1959 who determined the site was a room block of 15–20 structures, most of which were burned. The nearby Layton Field site, heavily damaged by plowing, was also examined by Ray. This paper will summarize Ray's field notes from both sites, present a detailed inventory of the artifact assemblages, and discuss the results of ceramic typological and obsidian sourcing analyses.

Smith, Karen [79] see Garland, Carey

Smith, Kathryn [57] see Wygal, Brian

**Smith, Kevin (Haffenreffer Museum, Brown University)****[82]***Naturalizing the "Unnatural" Natural: Archaeological and Documentary Perspectives on Responses to Volcanism in Viking Age Iceland*

Recent archaeological work inside western Iceland's Surtshellir cave suggests it was a site at which sacrifices were conducted throughout Iceland's Viking Age (AD 870–1000). The cave itself formed in an eruption that began shortly after Iceland's colonization and lasted several decades, covering 240 square miles (90 km<sup>2</sup>) of once-fertile land beneath black, smoldering lava. This was the first major eruption directly experienced by any northern European community since the Lacher See eruption, 13,000 BP, and the existential challenges it posed seem to have reflexively molded and been partially molded by Norse concepts about Ragnarök, the end of the world. However, neither this eruption nor ones that followed soon afterward appear to have slowed Iceland's colonization or caused its emerging society to collapse. Rather, responses to perceived causes of volcanism may have strengthened elites' authority at the time that Icelanders were creating a formalized political system to integrate its dispersed Viking Age chiefdoms. A century later, when Iceland converted to Christianity, perceptions of volcanism appear to have shifted from seeing it as a threat requiring extreme measures to understanding it as a "naturalized" part of the cognized environment through which major social transformations could be debated and society could adapt.

**Smith, Mark and Susan Malin-Boyce (USACE, St. Paul District)****[81]***The Iraq Mass Graves Project*

In 2004 Michael "Sonny" Trimble formed the Mass Graves Investigation Team (MGIT) in response to a request from the Department of Justice's Regime Crimes Liaison Office (RCLO). Between 2004 and 2008 he led the excavation and analysis of individuals recovered from 16 mass graves, repatriating hundreds of individuals primarily of Kurdish descent. Evidence gathered from this work was used in the prosecution of Saddam Hussein and members of his regime. Throughout the existence of the MGIT, Dr. Trimble continually sought to innovate and improve the team's structure and composition, learning from each successful mission and drawing on his breadth of experience in academic and government archaeology.

**Smith, Michael (Arizona State University)****[163]***George Cowgill's Approach to Comparative Urbanism*

Throughout his career, George Cowgill maintained an active interest in comparative research and theory on early cities and states. His articles in the *Annual Review of Anthropology*—one on Teotihuacan and one on early cities—remain among the most frequently cited papers on those topics. I highlight the contributions that his comparative urban research made to his understanding of Teotihuacan, and the reciprocal role that Teotihuacan played in his comparative thinking. I also review Cowgill's theoretical work on early urbanism and Teotihuacan. He mostly restricted his theoretical inspiration to archaeology and anthropology. Methodologically, his comparative work was almost entirely qualitative in nature, which seems strange for a major contributor to quantitative archaeology. Theoretically, his partial embrace of practice theory may have inhibited a fuller understanding of the interplay of top-down and bottom-up forces in urban life. George Cowgill was a complex thinker whose comparative work on urbanism—and on Teotihuacan—continues to inspire archaeologists.

Smith, Michael [91] see Sherfield, Anne

**Smith, Monica L. (UCLA)****[13]***Discussant***Smith, Morgan (University of Tennessee, Chattanooga) and Shawn Joy (SEARCH Inc.)****[46]***Quarried Landscapes in Apalachee Bay: A View from Clint's Scallop Hole*

Recent investigations at the Clint's Scallop Hole site (8JE1796) have provided a new data point from which to examine submerged landscape use in Apalachee Bay, Florida, USA. Ongoing research at the site from 2017 onward has yielded an extensive dataset on quarried material from this bedrock exposure of Suwannee chert. Based on recent sea-level data, the site, located ~6 km offshore in the Gulf of Mexico, was inundated during the Late Archaic: a timeline which is supported by an absence of ceramics from the site. This paper will review, from a lithic technological organization perspective, what is currently known about precontact land-use in Apalachee Bay. Next, a thorough review of the assemblage from Clint's Scallop Hole will be presented, in light of what is known from inundated quarry sites in Apalachee Bay. Last, a review of current trends and future directions in offshore Gulf of Mexico work will be discussed.

**Smith, Morgan (University of Tennessee, Chattanooga)****[46]***Discussant***Smith, Nicole (University of California, Los Angeles) and Alaina Wibberly (University of Chicago)****[107]***Archaeological Ethnography and the Politics of Encounter: Navigating Landscapes of Conflict along the US-Mexico Border*

Since 2020, the Ruby Archaeological Project (RAP) has conducted archaeological fieldwork in the historic ghost town of Ruby, Arizona, investigating how histories of resource extraction, labor migration, and colonial settlement have defined landscapes along the US-Mexico border. In the summer of 2021, we (instructors of the RAP Field School) found ourselves not only excavating a historic archaeological site, but also navigating the contemporary encounters created by prevention through deterrence strategies and shifting global migration routes associated with clandestine movement across borders. The tension between the past and present politics of Ruby highlighted how archaeological research practices can mirror colonial models of extraction. Using the framework of the "*encuentro*" (encounter), which ties political action to methods of non-extractive knowledge production, we look to ethnographic practice to reflect on the relationships between structural violence, personal agency, and the responsibilities of archaeologists working within an unfolding humanitarian crisis. Emphasizing reflexivity in archaeological practice, we explore how archaeological ethnography can provide ethical frameworks for engaging in active landscapes of conflict.

**Smith, Ryan (University of Pittsburgh)****[84]***The Long-Term Development and Organization of Multiethnicity along the Eastern Andean Slopes: A Case Study from the Carabaya Valleys of Southern Peru*

Within the ethnic patchwork of the Central Andes, the steeply sloping eastern and western flanks are striking in that they appear to have repeatedly encouraged multiethnic settlement systems where groups of various origins and identities interacted and even lived

among one another for extended periods of time. Common geographic and ecological factors of these valleys played a significant role in repeatedly encouraging socially plural arrangements, such as their intermediate location, moderate climate, and unique resources. The importance of such factors are not to be overstated, yet so too must archaeologists consider common social and political factors that encouraged various arrangements of multiethnicity through time, as well as those which may have discouraged it altogether. Using data from a 70 km<sup>2</sup> regional survey strategically positioned to straddle the cordillera Carabaya in southern Peru, this research addresses the long-term development of multiethnic societies along the intermediate eastern slopes of the Andes. Special attention is given to the "chawpirana," the mid-to-upper valleys where highland colonies are directly identified in early colonial records with purported prehispanic and possible pre-Inca origins.

**Smith, Ryan (University of Pittsburgh)**

[84]

*Chair*

Smith, Ryan [129] see Arkush, Elizabeth

Smith, Ryan [9] see Kohut, Lauren

**Smith, Scott (Franklin & Marshall College)**

[156]

*Perdurance and the Politics of Place at Iruhito, Bolivia*

This paper draws inspiration from Wendy Ashmore's ideas about how places come to accumulate meanings as they anchor the practices, beliefs, and political projects of diverse agents. Taking these ideas as a starting point, I explore the biography of the Iruhito, located along the Desaguadero river in the Bolivian altiplano. Archaeological research indicates that Iruhito has a long history of broadly continuous occupation stretching from around 800 BC to the present. Looking more closely at this long-term history, however, reveals periods that might be typically thought of as "hiatuses" in occupation, when the site seems to have been intermittently abandoned for several centuries at a time. It is these hiatuses that I wish to consider in more detail. I use the concept of perdurance to explore how the significance of Iruhito stretched through time and I consider the way that place may have been fundamentally dynamic, extending and shifting across a wider geographic range at different historical moments, in part in relation to the dynamism of the river. Finally, I discuss how these ideas can inform our understanding of the political history of this meaningful place.

Smith, Scott [87] see Pérez Arias, Maribel

**Snider, Joseph (Ohio Valley Archaeology Inc.) and Jarrod Burks (Ohio Valley Archaeology Inc.)**

[94]

*Recovering Data from the Trace Rockshelter in Jackson County, Ohio: A Successfully Litigated NAGPRA Case*

In late 2012 the Trace Rockshelter site in Jackson County, Ohio, was looted by three individuals. They later sold what they had found to a fourth individual, including the skeletal remains from eight burials and many artifacts recovered from a dense midden. DNA evidence was used to confirm the human remains were Native American and two of the excavators and the buyer of the artifacts pleaded guilty in US District Court under NAGPRA. Ultimately, the remains and objects were repatriated for reburial. In this poster we present details related to the many hundreds of artifacts related to this case. Projectile points from across nearly every time period were recovered, as well as a large Late Archaic/Early Woodland period ceramic assemblage and bone tools, two of which were radiocarbon dated to the Late Archaic period. Though this robust artifact assemblage comes from an unfortunate situation, the data derived from it compares well with other rockshelter excavation results in southern Ohio.

Snitker, Grant [108] see Llobera, Marcos

**Snow, Meradeth (University of Montana) and Michael Searcy (Brigham Young University)**

[14]

*A Reanalysis of Population Dynamics in the Casas Grandes Region of Northern Mexico Using Mitochondrial DNA*

The Casas Grandes region in northwest Chihuahua, Mexico, is ideally situated to explore the notion of contact between the Southwest/Northwest and Mesoamerica, as it lies geographically in the borderlands where traditions of both culture areas were practiced. In order to explain these ties, past researchers have suggested the flourishing Casas Grandes population in the thirteenth century AD was caused by migrants from Mesoamerica, as first suggested by Di Peso in his pochteca hypothesis. Others, such as Lekson and his Chaco Meridian hypothesis, suggest migration from the north. Mitochondrial genetic data from earlier and later time periods provides the ability to reanalyze which, if any, direction these connections can be made. Comparing the full mitogenomes from 140 individuals, we show that low levels of migration occurred diachronically, although they still may have contributed to hybridized cultural practices. While the likelihood for wide-scale population replacement is soundly rejected, the genetic data suggest the possibility of smaller-scale migration.

Snow, Meradeth [176] see Jensen, Samuel

Snow, Meradeth [86] see Sedig, Jakob

Snow, Meradeth [111] see Summers-Wilson, Rachel

**Snyder, Thomas (University of California, Davis) and Randy Haas (University of California, Davis)****[51]***Quantifying the Utility of Satellite Survey for Archaeological Site Discovery: An Experimental Analysis in Southern Peru*

Satellite imagery has become a versatile remote sensing tool for archaeologists to detect sites in a manner considerably less costly than pedestrian survey. However, the utility of satellite survey has not yet been quantified. Here, we evaluate the efficacy of satellite survey in southern coastal Peru by comparing satellite survey results with those of three published pedestrian surveys. Twelve participants with varying levels of experience performed unstructured satellite surveys of 197 km<sup>2</sup> of land in the Sama and Moquegua Valleys in southern Peru. Results indicate an average site discovery rate of  $9.3 \pm 0.03\%$ . Factors influencing this discovery rate include, in order of importance, level of formal archaeological training, regional expertise, GIS experience, and time spent surveying. The most experienced surveyors produced a site detection rate of  $14.0 \pm 0.6\%$ . False positive identifications of sites occurred at a rate of  $19.4 \pm 0.5\%$ . Factors influencing the incidence of false positives include regional expertise and time spent surveying with the most experienced surveyors producing a false-positive rate of  $16.4 \pm 0.7\%$ . The analysis shows that satellite survey can be a useful but limited tool for site discovery in advance of pedestrian survey and further suggests a method for quantifying satellite survey utility in different parts of the world.

**Soares, Justin (University of Iowa), Derick Juptner (University of Iowa), Rui Mataloto (Municipal Archaeologist of Redondo, Portugal), Katina Lillios (University of Iowa) and Matthew E. Hill (University of Iowa)****[108]***Subsistence Practices during the Bronze Age (2200–750 BCE) of Southwestern Iberia: An Analysis of the Faunal Assemblage from Evoramonte (Évora, Portugal)*

Major social transformations occurred in Southwest Iberia between the third and early second millennia BCE (Copper to Early Bronze Age), although little is known about the lifeways of people in the region during the Bronze Age. Evoramonte was one of several Bronze Age settlements located along the Serra d'Ossa mountain range in Évora, Portugal. Excavations at Evoramonte, although not extensive, indicate continuous occupation throughout the Bronze Age (second millennium BCE). In addition to ceramics and metals, excavations at this highland site unearthed a surfeit of faunal remains. Not only does the existence of animal bones make the site a rarity, as the acidic soils of the region typically foster a rapid breakdown of bone, but their sheer number and excellent preservation provide the unique opportunity to examine the subsistence practices of a Bronze Age community in Southwest Iberia and to assess changes over time. This paper presents the results of a preliminary faunal analysis focusing on the species and age profiles of the animals at Evoramonte, and the possible tools used during their butchery, with the intention of elucidating the question of how inhabitants of highland settlements during the Iberian Bronze Age relied on animals as a resource.

**Soares, Justin (University of Iowa)****[108]***Chair***Sobel, Elizabeth (Missouri State University) and Anna Antoniou (American Philosophical Society)****[131]***Meaningful Middens: Indigeneity, Self-Determination, and Shellfish Amid Colonization in Willapa Bay, Washington*

The decolonization of anthropological archaeology is arguably the most significant recent development in North American archaeology. When applied to Pacific Northwest shell middens, decolonization requires us to consider continuity and change in the behaviors that generate shell middens in the context of Euro-American colonization. We take this approach in a study of shell middens in Willapa Bay, Washington, in the homeland of the Chinook and Lower Chehalis peoples. Using archaeological, historic, and ethnographic information, we explore the formation and dynamic meaning of shell middens in Willapa Bay from precontact times through the present. We make three arguments. First, shell middens of the region are diverse in composition and structure, and we have only begun to understand that variation. Second, while shell midden formation largely ceased amid Euro-American colonization, shellfish have remained central to local Indigenous cultural survival and identity. Third, Indigenous assertion of identity and land-rights cannot be separated from shell-rich deposits. In the fight for self-determination, these deposits are critical evidence of the persistent intimate relationship between Indigenous communities and the Bay. While colonialism shifted their roles, shellfish and shell-rich archaeological deposits remain culturally, economically, and politically vital in the descendant communities of Willapa Bay.

Sobel, Elizabeth [77] see Worman, F. Scott

**Socha, Amy****[115]***Structure Collapse and Abandonment: Patterns in the Archaeological Record*

Abandonment is a transformation in the context of a structure. It is both a single event or moment in time when that transformation occurs and the continuum of circumstances preceding and following that moment. Abandonments can be categorized by why they occur and by how long a structure remains abandoned. Causes of structure abandonment are varied, and most often occur in combination, resulting in a choice, conscious or unconscious, to continue or discontinue use of a structure. When a structure is permanently abandoned, it is acted upon primarily by nature, and its collapse is dictated by gravity and local rates of weathering. These forces act on the structure as a whole and can be quantified based on principles of physics and geology. By comparing a stone structure to a cliff, I apply the concept of hillslope diffusion to the formation of mounds from an abandoned structure to calculate the length of time since a structure was abandoned using a quadratic equation representative of the shape of the mound. Utilizing this method could provide an upper limit for the occupation of a site that could be calculated during survey prior to excavation, providing information on settlement patterns and regional abandonments.

**Soderberg, John (Denison University)****[42]***Animals and Monasticism in Early Medieval Ireland*

Archaeologists tend to have split vision when considering monasteries or other sorts of sacred settlements. We see sacred space. We see settlement space. But, we struggle to see space that is both. Practice-based archaeologies of religion have done much in recent decades to transcend such dichotomies. This paper advances that project by approaching the intersection of religion and economics from the perspective of animals. Animals are commonly recognized as fueling economies when their bodies are transformed into food or raw material for manufacturing. In this sense, animals are often seen as belonging only to the settlement side of sacred settlements. This paper argues that they were also involved in creating sacred space. The key is understanding how animals animated human communities.

**Soderberg, John (Denison University)****[42]***Chair*

Somers, Bretton [154] see McKillop, Heather

Somerville, Andrew [38] see Chapman, Larkin

Somerville, Andrew [222] see Fauvelle, Mikael

Sonne, Christian [28] see Routledge, Jennifer

**Sorresso, Dominique (University of Florida)****[150]***Characterizing Communities in the Upper Tombigbee River Drainage through Microscopic Assemblages*

Assemblages are gatherings of diverse components that act upon each other and are in a constant state of becoming. The relationships between parts are not fixed, and components can be separated from one assemblage and added to another without completely changing the component itself. Assemblages of practice may be used to discern material practices of identity formation within communities. By taking an assemblage approach to petrographic analysis, assemblages can be recognized within a single vessel. Microscopic assemblages within the vessel may allow for the observation and analysis of relationships between the potter and the vessel's microscopic constituents (e.g., the clay matrix, temper, natural inclusions), as well as relationships between the constituents themselves. From this perspective, this study analyzes petrographic data of pottery from four Mississippian (AD 1000–1550) sites in the Upper Tombigbee River Drainage of Alabama and Mississippi. The active, often ephemeral, nature of assemblages may reflect the coalescence of the communities in this region. Microscopic assemblages can be utilized as technological proxies for coalescence at the smallest scale. Assemblages at this level can lend information regarding local traditions and natural resources utilized, as well as how these factors are affected by the coming together of different groups.

**Sosa Aguilar, Danny (California State University, San Bernardino)****[179]***Interpretations of Charcoal: Collaborative Archaeology in Abiquiu, New Mexico*

The Abiquiu Mesa Project works with the Merced del Pueblo de Abiquiu as community partners in investigating their history. This project strives to create ethical and accountable archaeology rooted in how archaeology can positively impact the contemporary community. This aspect of the project operates in conversation with these issues by investigating archaeological features and material culture found throughout Abiquiu, specifically on and around the Abiquiu Mesa. This project engages in methodology centered on collaborative archaeology to tell a narrative of a precontact Abiquiu history as it has been co-created over time by Abiquiu landscape narratives and material culture. A radiocarbon analysis along with excavation methods confirm an anthropogenic fire. This new data brings to light a distinct Indigenous interpretation for rock alignment features found atop the Abiquiu Mesa.

**Sosa Ruiz, Mónica (Escuela Nacional de Antropología e Historia) and Mijaely Castañón-Suárez (El Colegio de Michoacán)****[174]***What the Fire Left Us: Negative Pottery and Its Conception in Michoacán*

Ceramics in archaeology have provided us with information about sites, temporality, power, and beliefs, but can pottery tell us something more about their makers and their ways of living and relating (with it, others and with nature)? There are so many unknown aspects of the potter creational process that involve beliefs and perceptions about materials and their employment on pots. Certainly, the materials involved in creating a ceremonial or sumptuary pot would be carefully selected. Can these materials, the way they were employed and its resultant, reveal the ontology of the individual potter and that of his community? With this poster my objective is to present the investigational protocol I would follow to answer the above questions. By applying an ontological theoretical framework, practical experimentation and a linguistics approach I would study the so called "negative pottery" in Michoacán. By doing it, I expect to know the Mesoamerican ways of making and conceiving of this type of decoration in Michoacán.

Southon, John [221] see Chatters, James

Soutif, Dominique [181] see Hendrickson, Mitch

Soza, Danielle [216] see Zedeño, María Nieves

Spangler, Jerry [47] see Vernon, Kenneth

**Spears, Michael (Anthropological Research LLC), Octavius Seowtewa (Zuni Cultural Resources Advisory Team, Pueblo of Zuni) and Kurt Dongoske (THPO, Pueblo of Zuni)**  
[152]

*Zuni People in Relation to the Chacoan World*

Zuni people need not look far beyond their front door to see and experience the Chacoan world. Village of the Great Kivas, and other ancestral Zuni sites associated with the archaeologically defined Chacoan tradition, have always been integrated into the Zuni understanding of their history and culture. Today, Zuni people maintain their collective and individual personal relationships to these sacred places through ongoing cultural practices, in spite of more than a century of geopolitical actions restricting their access to the Chacoan landscape. Moreover, the Pueblo of Zuni proactively engages in historic preservation research to assert their connections to the Chacoan world in support of the cultural practices of Zuni people, and to engage in the archaeological discourse about the Puebloan past. In this paper, we draw from recent ethnographic projects conducted by and with the Pueblo of Zuni to highlight Zuni perspectives about the Chacoan world and some of its components, with particular focus taken on the concept of Chacoan outliers.

**Speer, Charles (Idaho State University)**

[30]

*A New Method for Trace Element Analysis of Large Artifacts*

[WITHDRAWN]

**Spenard, Jon (Cal State University San Marcos)**

[177]

*A Long Overdue Return to the Cold River: Archaeology of the Rio Frio Caves, Cayo District, Belize*

The Rio Frio caves in western Belize have been known to Maya archaeology for close to a century, yet they remain poorly understood and understudied. In 2018, they became a primary focus of the Rio Frio Regional Archaeological Project (RiFRAP), the first multiyear project dedicated to their archaeological investigation. Among the goals of the RiFRAP are (1) establishing individual cave and regional chronologies; (2) determining who was using the caves, and (3) why; (4) mapping the caverns to contemporary archaeological standards; (5) employment of digital recordation in those efforts; and (6) reconnaissance for all known and unrecorded cave sites in the study area. This presentation reviews the history of research in the area and discusses the results of our first two field seasons. In short, all known sites were used during the Late to Terminal Classic periods (AD 700–900/1000) by Maya people strongly affiliated with the Belize Valley. As well, our reconnaissance efforts resulted in the rediscovery of a primary center unknown to archaeology, the people from which were likely who were using the caverns. A product of the technology used in data collection is included in the talk.

Spence-Morrow, Giles [9] see VanValkenburgh, Parker

**Spencer, Kaylee (University of Wisconsin–River Falls), Travis Nygard (Ripon College) and Linnea Wren (Gustavus Adolphus College)**

[59]

*The Maize God and Ritual Containers: Text, Image, and Materiality in a Maya Cache Vessel Lid*

Imagery representing the Maya Maize God appears frequently in the corpus of Classic Maya ceramics. This research focuses on an unprovenanced Early Classic cache vessel lid featuring a version of the Maize God at its center. In this paper, we investigate the array of images, icons, and texts accompanying this deity and explore their meanings. Referencing many materials from the natural world, the collection of icons and glyphs appearing with the maize deity allude to both bloodletting and burning activities. This paper further examines the icons and texts in relation to other cache vessel lids of similar style, where Maya artisans employed similar icons, texts, and even forms. In most cases, the spatial arrangement of the imagery on the vessels contributes additional meaning to the objects and connects them to broader Maya worldviews. Finally, we consider the spatial and material qualities of Maya caches from Late Preclassic and Early Classic contexts and use comparative data to suggest ways that such cache vessel lids may have functioned as aids and implements in ritual events.

**Spencer, Kaylee (University of Wisconsin—River Falls)**

[59]

*Chair*

Spencer-Smith, Jesse [206] see Eberl, Markus

Spencer-Smith, Jesse [206] see Johnson, Phyllis

Spencer-Smith, Jesse [206] see Rieth, Amy

**Sperling, Stephanie (Maryland-National Capital Park and Planning Commission, Department of Parks and Recreation)**  
[190]

*Innovate, Adapt, and Pivot: Creating Flexible Public Programming during a Global Pandemic*

Prince George's County, Maryland, located outside of Washington, DC, has a rich and complicated history. Today, it is one of the wealthiest majority-Black jurisdictions in the nation, but many of its sprawling subdivisions were constructed on former tobacco plantations where countless men, women, and children were enslaved before Emancipation. In the centuries before European colonists brought African slaves to the New World, Indigenous tribes like the Piscataway occupied these lands and they remain in the region to this day. In normal times, archaeologists of the Maryland-National Capital Park and Planning Commission, Department of Parks and Recreation unpack these and other complex stories through outreach efforts designed to initiate conversations about our difficult pasts, but COVID-19 presented an unexpected opportunity to rethink much of what we do. With varying degrees of success, we created and produced short videos, implemented virtual summer camps, developed in-person archaeology lab events, and organized interactive conversation circles. This challenge inspired creative new programming that will be used and modified for years to come.

**Sperling, Stephanie (M-NCPPC, Dept. of Parks & Recreation)**

[190]

Chair

**Speth, John (University of Michigan)**

[16]

*Rethinking Binford's Utility Indices for Use in Eurasian Paleolithic Contexts*

One of Binford's major contributions was his development of utility indices—rankings of ungulate body parts according to their meat, marrow, and grease value. He developed these indices among the Nunamiut because he felt that inland caribou hunters provided an ideal analog for Neanderthal reindeer hunters in Pleistocene Europe. Unfortunately, he missed aspects of northern subsistence practices that are critical to interpreting the indices. Muscle mass plays a dominant role in determining body part rank. Meaty upper limbs therefore are usually highly ranked. But ethnohistoric records show that northern foragers considered muscle meat ("steaks") as dog food or white man's food, because it contained neither fat nor vitamin C. Thus, muscle meat was often fed to dogs or discarded. So, if I were to rethink Binford's utility indices for Paleolithic contexts, internal organs would rank number one because they have the most fat and vitamin C. Second would be fatty units like ribs, hump, adipose, marrow, and grease. Hides for clothing, shelter, and equipment might be next. In last place would be the meat on the limbs! As Morin and Ready (2013) show, marrow indices are better predictors of bone transport than indices heavily weighted toward muscle mass.

**Spiwak, Alexa (University of Oslo)**

[50]

*Bastard Rock, Bastard Landscapes: Remnants of the North Wales Slate Industry*

As the slate industry of North Wales reached its peak during the latter half of the nineteenth century, quarries dumped upward of 3.5 million tons of waste rock—colloquially known as "bad" or "bastard" rock—per year, forming massive rubble piles known as "tips." Long after the industry's collapse in the early twentieth century, these tipping piles dominate the Welsh landscape, altering the local topography and dwarfing the quarries from which they were extracted. In light of Gwynedd County's recent UNESCO cultural heritage designation, discussions related to the threat of loss and the ongoing care of this waste have once again come to the fore. Although granted a great deal of cultural importance, tips now host emergent plant and animal ecologies that have found unique ways to thrive in the wake of industry, collapsing the divide between nature and culture. The mountains of slate rubble, together with their associated quarry scars, form hybrid postindustrial playgrounds for tourists and archaeologists alike, allowing for the exploration of what heritage in-and-of the Anthropocene is, how it can be cared for, and how heritage can orient itself toward the future instead of merely holding on to the past.

**Splitstoser, Jeffrey (George Washington University) and Jon Clindaniel (University of Chicago)**

[189]

*Color in Wari and Inka Khipus*

The colors of pre-conquest Andean *khipus* have long been thought to have played an important role in the encoding of information. However, pre-conquest *khipu* color signs remain undeciphered and it is not clear how conventionalized they were across regions. In this talk, we examine whether there is evidence for regional differences in how color signs were used in Middle Horizon *khipus*. We use these findings to make inferences about the nature of Wari interaction with local communities via their *khipus*—whether it was through use, or imposition, of uniform *khipu* signification standards, or by tailoring signs to fit local practices and needs. Finally, we assess the extent to which localized patterns of color use continued into later periods (e.g., in Inka *khipus*), concluding with a discussion of what regionally specific interactions might mean for our understanding of Andean *khipu* practices more generally.

**Sportman, Sarah (Connecticut Office of State Archaeology, University of Connecticut) and Brianna Rae (University of Connecticut)**

[109]

*A Reevaluation of Precolonial Indigenous Occupations at the Grannis Island Site (93-9), New Haven, Connecticut*

The Grannis Island Site (93-9) is a multicomponent Indigenous site located on a small island in the Quinnipiac River. An initial investigation conducted in 1947 by Howard Sargent was followed by decades of intermittent excavations by the Greater New Haven Chapter of the Archaeological Society of Connecticut (GHNAS). GHNAS began extensive analyses and reporting on the recovered materials, but the work was never completed. In 2021, the Connecticut Office of State Archaeology, which curates the artifact collection and site documentation, began actively cataloguing and reanalyzing the collection to produce a comprehensive synthesis

of the site. Lithic materials from Grannis Island indicate occupations from the Middle Archaic through the Late Woodland periods, and an extensive, but shallow, shell midden at the site facilitated the rare preservation of a large and diverse faunal assemblage. This paper presents the preliminary results of the reanalysis, with a focus on the lithic and faunal assemblages.

Sprain, Courtney [90] see Kracht, Olivia

**Springate, Megan**

[100]

*Discussant*

Springer, Kathleen [184] see Holliday, Vance

**St. Amand, Frankie (University of Maine Climate Change Institute), Elizabeth Leclerc (University of Maine), Emily Blackwood (University of Maine) and Heather Landazuri (University of Maine)**

[88]

*Getting into (and out of) Hot Water: Climate Hazards, Resiliency, and ENSO in the Archaeological Record*

Throughout the Holocene, coastal Indigenous Andeans exploited a diverse range of ecological zones and responded to seismic activity, changing environmental settings, and the disruptions and opportunities that accompany the climate phenomenon known as El Niño. During normal years, Andean rainfall, snow, and glacial melt are the only life-supporting sources of fresh water on the Pacific margin. Meanwhile, the ocean provides access to one of the richest fisheries in the world. Aperiodically, El Niño causes severe disruptions to these fresh and saltwater systems, challenging Andeans' capacity to sustain their subsistence and economic needs. Since the 1980s, the concept of El Niño-as-disaster has featured prominently in the study of cultural development in coastal Peru. We examine adaptation as a key component of past Indigenous resilience to the El Niño-Southern Oscillation (ENSO) system. Associated with both long-term climate change and punctuated climate disasters, ENSO provides a powerful lens for studying human adaptation to climate change across varied timescales. El Niño events required Andeans to be prepared for and negotiate with abrupt changes to food, fuel, water, structures, and other resources. Focusing on the region north of 12°S, we describe Andean responses to ENSO within a framework of coping, incremental, and transformative adaptation.

**St. John, Amy (Archaeometry Research Group, CELAT Research Centre, Université Laval)**

[28]

*Inside Perspectives on Ceramic Manufacturing: Visualizing Ancient Potting Practices through Micro-CT Scanning*

Micro-computed tomography (CT) analysis offers a new perspective on archaeological ceramic manufacture, augmenting traditional studies that focus on decorative and morphological aspects of ceramic vessels. In this study I scanned ceramic sherds representing 67 vessels from the Arkona Cluster sites in Ontario, Canada. These vessels come from a series of contemporaneous and/or sequentially occupied sites dating to between ca. 1000 and 1270 CE. High resolution, 3D, micro-CT images revealed different ceramic forming methods by identifying the characteristic gestures and techniques, as well as idiosyncratic corrective measures used by potters to form vessel rims. These techniques or "tools of the trade" reflect potters' engagement with tradition and innovation while working within a community of practice. The ability to highlight, in three dimensions, void spaces in the ceramic fabric, allowed scanned images to reveal unique aspects of ceramic manufacturing practices. The capacity to see these practices and gestures revealed that potters at the Arkona Cluster were engaged, skilled craftspeople, working within multiple ceramic traditions, reflecting a distinct regional material expression. Through micro-CT analysis, the ceramics at the Arkona Cluster illustrate the skill, idiosyncratic expressions, and improvisations of an artisan community sustaining tradition and innovation at this specific time and place.

Stafford, Thomas [18] see Zimmermann, Mario

**Stagg, Sarah (University of Wyoming)**

[224]

*Reassessing Change and Continuity in Cajamarca Ceramic Iconography*

[WITHDRAWN]

Stahlschmidt, Mareike [20] see Abdolazadeh, Aylar

Staley, Iris [173] see Wichlacz, Caitlin

Stalla, David [155] see MacDonald, Brandi

**Staller, John (Field Museum)****[224]***Incahuasi de Caranqui, the Palace Complex of Atahualpa, the Last Inca Emperor, Imbabura Province, Ecuador*

The “house of the Inca,” or Incahuasi de Caranqui, in Imbabura Province is located in the Indigenous town of Caranqui south of the provincial capital of Ibarra. Incahuasi de Caranqui was a palace estate constructed by the Inca for the emperor Huayna Capac in the context of expansion into northernmost Ecuador. Caranqui is also the birthplace of his son Atahualpa, the last Inca emperor. Spanish chroniclers state Caranqui was the birthplace of Princessa Pacha, the favorite wife of the Inca emperor, and mother of Atahualpa. Incahuasi is situated directly beside the Inca highway, or Camino Real, at the foot of the Imbabura volcano. It was buried several times by landslides related to earthquakes and volcanic eruptions. Archaeological research of a rectangular cut stone pool uncovered in the course of field research and fed by stone canals that maintained a constant depth in the pool. Lunar and solar reflections on the surface of the water were related to calculating different points in the annual lunar and solar cycles

**Stanish, Charles (University of South Florida) and Elizabeth Klarich (Smith College)****[87]***Tiwanaku in the Northern and Western Lake Titicaca Basin*

John Janusek’s work has been foundational for archaeologists investigating areas outside of the core region of Tiwanaku in the southern Lake Titicaca Basin. Survey and excavation data collected over the last three decades demonstrate substantial Tiwanaku settlement from the Ccapia region of the western basin into the far northern Huancañé and Pukara areas. In this paper, we discuss the implications of these datasets for understanding the diverse and dynamic expansion of the Tiwanaku state across the basin. We also highlight the ways that Janusek’s theoretical work—particularly his emphasis on the ritual aspects of Tiwanaku—has altered these interpretations.

**Stanish, Charles (University of South Florida)****[194]***Discussant***Stanton, Travis (University of California Riverside), Scott Hutson (University of Kentucky) and Traci Ardren (University of Miami)****[54]***Work, Wealth, and Status: Estimating Inequality through an Analysis of Aerial Lidar Data from Coba, Quintana Roo, Mexico*

Among the many ways that researchers can use to calculate inequality in the Maya region, volume of domestic construction represents a quantifiable way of estimating the labor invested in residential areas that can be calculated from lidar data. In lieu of excavation data from households that can show patterns of access to items of value such as greenstone and finely made ceramics, lidar data provide a method that can be extended over large areas relatively quickly. In this paper we perform an analysis of residential volume calculations at the site of Coba, Quintana Roo. While the chronology of settlement will always represent a challenge in such efforts, data from extensive excavations in both the monumental and residential zones of Coba suggest that the great majority of the site dates from the sixth to eighth centuries AD, the same span of time hieroglyphic inscriptions indicate the presence of a dynastic line responsible for the creation of a large body of carved monuments. In comparison to many other Maya cities, this smaller window of time for urban occupation helps to mitigate some of the chronological challenges.

Stanton, Travis [34] see Collins, Ryan

Stanton, Travis [128] see Coltman, Jeremy

Stanton, Travis [156] see Taube, Karl

**Stark, Jonathan (Los Alamos National Laboratory)****[66]***Capturing Plutonium: Architectural Strategies for the Recovery of Heavy Metals during Manhattan Project High-Explosives Testing at Los Alamos, New Mexico*

Archaeologists at Los Alamos National Laboratory recently identified a firing pad that played an important role in the detonation of the first atomic device. The Trinity Test occurred on July 16, 1945, formally ushering the world into the atomic age while confirming the viability of a plutonium implosion device. Less than a month later, a comparable device was weaponized and detonated over Nagasaki, Japan on August 9, 1945. The events of the summer of 1945 changed the sociopolitical landscape of the world forever. Recent archaeological fieldwork at the firing pad has produced a wealth of data instrumental in furthering our understanding of these events. The firing pad exhibits unique architectural features designed and built for the sole purpose of capturing plutonium fragments for recovery and eventual reuse. The extremely low supply of plutonium at the start of the Manhattan Project garnered an uneasiness that stocks of the rare element would be exhausted ahead of full-scale testing and deployment. This poster offers a closer examination of architectural features applied to capture and recover metal proxies following high-explosives testing and explores links of design and construction in the adoption of later efforts to conserve plutonium supplies.

**Stark, Miriam (University of Hawai‘i at Manoa)****[214]***Fragility, Resilience, and Long-Term History: The Case of Angkor*

The political ecology of civilizations—their rise, collapse, and regeneration—has become increasingly popular as advances have been made in both research methods (from remote sensing to paleoclimatic reconstruction) and in our understanding of contemporary environmental issues. Archaeological research offers insights into how both small-scale and state societies created and responded to environmental and social crises through time and factors that promoted long-term resiliency. Viewed in the *longue durée*, the

premodern Khmer civilization proved resilient as its states rose and fell against a backdrop of environmental change. The popular narrative of Angkor includes a cataclysmic collapse, brought on by climatic factors, in the mid-fifteenth century CE, despite 25 years of archaeological and environmental research. This paper deconstructs environmental determinist explanations of the collapse of the ninth- to fifteenth-century Angkor Empire by reviewing current knowledge of landscape management, agricultural strategies, and ideological transformations. I argue that what appeared fragile in the short term was built atop a resilient cultural foundation, and offers insights for addressing contemporary environmental issues.

Stark, Miriam [218] see Carter, Alison

**Starkovich, Britt (University of Tübingen), Kim Aluwé, Susan Mentzer (University of Tübingen) and Shyama Vermeersch (University of Groningen)**

[16]

*Pigs, Goats, and Sacrifice: The Influence of Stiner's Work in Later Contexts*

Mary Stiner's influence on the field of archaeology is broad and profound. Her interdisciplinary work on the Paleolithic and Neolithic is widely cited and has formed the basis for countless studies by other scholars in similar contexts. She was an important part of the movement to rehabilitate our understanding of Neandertals and other pre-*Homo sapiens* hominins as cooperative, competent hunters, and continues to highlight the importance of hominins as part of the predator guild. Stiner's methodological and taphonomic work, however, exists far beyond applications to Pleistocene and early Holocene sites. In this paper, I discuss several contexts that are far outside of Stiner's typical sphere of influence: Bronze and Iron Age settlements in the eastern Mediterranean, a sacrificial altar to the god Zeus in southern Greece, and a noble estate in medieval Belgium. Though these sites have little in common from a cultural standpoint, they are bound together by methods pioneered or popularized by Mary Stiner, through her students and the work of their students. Furthermore, the strong interdisciplinary example set by Stiner is invaluable in understanding human behavior in later time periods.

**Starkovich, Britt (University of Tübingen)**

[16]

*Chair*

Starkovich, Britt [85] see McCartin, Madison

Starkovich, Britt [16] see Mentzer, Susan

Starkovich, Britt [85] see Wong, Gillian

Stasiek, Artur [182] see Meierhoff, James

Stauffer, Grant [15] see Schilling, Timothy

**Stauffer, John (Washington University in St. Louis), Lucretia Kelly (Washington University in St. Louis) and Grace Ward (Washington University in St. Louis)**

[15]

*The Material Correlates of Social and Religious Life in Cahokia's Ramey Field, Illinois*

Some archaeological contexts are able to provide windows into critical aspects of past lifeways. In Cahokia's Ramey Field, materials collected from mound and plaza construction contexts and domestic features like house basins and pits provide important glimpses into social and religious life between the tenth and fifteenth centuries. Marked by important architectural changes including construction of mounds, palisades, and a plaza, the Ramey Field's material record provides an opportunity to examine how (and if) architectural changes reflect changes in food and craft production. In this paper, we examine ceramic, paleoethnobotanical, and faunal data with reference to the major shifts in Cahokia's architecture and describe the changing patterns that may track cultural changes in this pocket of the site's central precinct.

Staurset, Sigrid [149] see Nash, David

**Steele, Riley (McMaster University), Eduard Reinhardt (McMaster University), Samuel Meacham (Centro Investigador del Sistema Acuifero de Quinta), Fred Devos (Centro Investigador del Sistema Acuifero de Quinta) and Dominique Rissolo (Qualcomm Institute, University of California)**

[154]

*A 3,000-Year History of Coastal Landscape Evolution from Boca Paila Cave Sediments Provides Evidence on the Formation of a Classic Maya Canal System in the Sian Ka'an Biosphere, Mexico*

Submerged coastal cave systems of the Yucatán Peninsula hold well-preserved paleoenvironmental records that have not been fully explored. Reconstruction of coastal landscapes through analysis of cave sediment cores from Boca Paila lagoon in the Sian Ka'an Biosphere reveals details on the timing of wetland flooding and development of the canal system leading to Muyil, an important Classic Maya maritime trading site. Results from elemental and foraminifera analysis show three distinct phases of coastal evolution: Phase 1 (~1157 BCE) an upland forest, Phase 2 (1157 BCE–312 CE) shallow wetlands, and Phase 3 (>312 CE) mangroves/wetlands/lagoons. Previous archaeological work estimated that the first settlers arrived at Muyil ~350 BCE, but that population expansion and most construction occurred during the Postclassic (1000–1550 CE). Comparisons between human and environmental histories reveal interesting coincidences between the timing of wetland formation and increased maritime trade

activity. Results suggest that a rise in sea level (~1–1.5 m; >312 CE) facilitated canoe trade through the formation of extensive shallow wetlands/mangroves which provided a network of sheltered navigable channels in the Late Classic to Postclassic period. This study highlights human-environment dynamics in coastal regions, as well as the importance of karst cave systems and their paleoenvironmental records.

**Steelman, Karen (Shumla Archaeological Research & Education Center), Carolyn Boyd (Texas State University) and James Dering (Shumla Archaeological Research & Education Center)**

[101]

*New Rock Art Dates for the Lower Pecos Canyonlands*

The Shumla Archaeological Chemistry Laboratory has obtained new radiocarbon dates for Pecos River, Bold Line Geometric, Red Linear, Red Monochrome, and historic period styles of rock art. Using two independent methods, we provide reliable age estimates. For direct dates on paintings, we employed plasma oxidation to extract organic binders in the paint layer followed by accelerator mass spectrometry. For minimum and maximum ages, we treated overlying and underneath accretion layers with acid to isolate calcium oxalate for combustion and <sup>14</sup>C measurement to determine when the mineral coatings formed. Radiocarbon results are calibrated using the OxCal computer program to produce calendar age ranges. Overlying accretion layers are younger and underlying accretion layers are older. This correctly ordered, chronological stratigraphy of the accretion and paint layers supports the validity of both dating methods. These new results provide context for the significant, but lesser studied pictographs within the region.

Steelman, Karen [101] see Boyd, Carolyn  
Steelman, Karen [101] see Dering, James

**Steere, Benjamin (Western Carolina University) and Elizabeth Steere (University of North Georgia)**

[12]

*Unequal Footing: The Exclusion of Victorian-Era Women in Archaeology*

In the late nineteenth century, anthropological archaeology was a discipline in its infancy. In those early days, before anthropology was formally defined and codified as a four-field social science, women were actively involved in fieldwork and research, although their contributions were often downplayed or attributed to male colleagues. Despite being denied admission to many anthropological societies, women contributed to the burgeoning field by conducting archaeological excavations, writing ethnographies and field reports, and using anthropological methods of observation and cultural description to inform essays and fiction. In this paper, we use an interdisciplinary and Transatlantic perspective to examine the history, cultural context, and legacy of the exclusion of women in archaeology during the formalization of the discipline in the late Victorian era (ca. 1850–1900). Victorian anxieties about changing gender roles and the prospect of “The New Woman” made their way into dominant anthropological theories that highlighted differences between men and women and argued that strict divisions of labor that denied women agency were natural processes of cultural evolution. Paradoxically, even as women helped construct the foundation of the discipline, anthropological theory itself was used to discourage and exclude women’s contributions.

Steere, Elizabeth [12] see Steere, Benjamin

**Steeves, Paulette (Algoma University)**

[58]

*Discussant*

**Steffen, Anastasia (Valles Caldera National Preserve), Jamie Civitello (Bandelier National Monument), Kelsey Reese (University of Notre Dame) and Nicholas Jarman (Valles Caldera National Preserve)**

[127]

*After the Flames: Wildfire in the Jemez Mountains*

Fractured obsidian, spalled or toppled fieldhouse masonry-stones, cabin foundations reduced to ash, historic districts under threat of burning and floods, debris flows and gaping erosion trenches, vast denuded landforms, and a deep grieving for forests that will never return. Three decades of increasingly large and severe forest fires in the Jemez Mountains of north-central New Mexico provide a case study of the dire consequences that can result for landscapes, resources, and human experiences—a foreshadowing of the devastation occurring across the western United States. As the smoke clears, we can see that contemporary climate change is here, now, acting on landscapes altered by humans for millennia. This presentation highlights images and narratives developed to communicate the effects of forest fires on cultural resources at Valles Caldera National Preserve and Bandelier National Monument, share lessons learned from these fires, and explore how resources stewards are responding in the face of ecosystem transformation.

Stegemann, Julia [50] see Graham, Elizabeth

Stein, John [152] see Weiner, Robert

Steinke, Katharine [30] see Hamilton, Derek

**Stemp, W. James (Keene State College), Jaime Awe (Northern Arizona University) and Gabriel Wrobel (Michigan State University)****[216]***Better Late Than Never: Current Understanding of the Preceramic in Western and Central Belize*

Despite lagging behind the discoveries of Paleoindian and Archaic people in Northern Belize, evidence for a preceramic presence in Western and Central Belize has increased significantly in the last two decades. Until recently, there was no known Paleoindian lithic technology in these regions. However, the re-dating of Lowe points indicates hunter-gatherers were there at least as early as the Late Paleoindian (beginning ca. 10,500 BCE). There is ambiguous evidence for an Early Archaic human presence, but by the Late Archaic (3400–900 BCE) the use of plants, including early domesticates, is documented and stone tools for land clearance and/or early horticulture appear. Together, lithic technology, faunal remains, and plant pollen provide clues about subsistence practices and other resource use. The lithic raw materials from which tools were made offer insight into both local procurement strategies and the use of chert from outcrops in Northern Belize. The locations of recovery of these artifacts and ecofacts emphasize the importance of both caves/rockshelters and waterways in preceramic times. Archaeological evidence from Western and Central Belize is compared to that from other regions in Belize to better contextualize what we know about the preceramic overall.

Stemp, W. James [95] see Lee, Jordan

**Stephen, Jesse (Defense POW/MIA Accounting Agency)****[56]***Stewardship of the Missing: Roles of Archaeology in Unraveling Landscapes of Conflict*

In this paper the elasticity of landscape is used to reconsider the standing and significance of discrete locations and areas around the world where military personnel remain missing in action from historic conflicts. Stewardship, or the responsible management of a resource, is applied to better understand how the lands holding these losses connect people, places, and perceptions in atypical ways. Through the lens of the Defense POW/MIA Accounting Agency's archaeological activities, several case studies are offered to illustrate how effective stewardship of loss locations—and the advancement of heritage-related objectives—often requires a multilateral and multifaceted approach.

**Stephens, Jay (School of Anthropology, University of Arizona), David Killick (School of Anthropology, University of Arizona) and Shadreck Chirikure (School of Archaeology, University of Oxford)****[41]***X-files of Southern Africa: Investigating the Geological Provenance of Croisettes and Other Copper Ingots in Southern Africa*

This poster will present lead isotopic and chemical data on an assemblage of 44 copper ingots that includes 30 croisette ingots of the HH and HXR types from Zimbabwe, eight bun and bar ingots from Zimbabwe and South Africa, three Early Iron Age fishtail and rectangular ingots from Zambia, two ingots of the lerale and musuku types from Zimbabwe and South Africa, and one experimentally cast modern ingot from Kansanshi mine, Zambia. The lead isotopic and chemical results for these objects not only prove that a significant flow of ingots was coming from the Central African Copperbelt to Zambia and Zimbabwe but also demonstrate imitation of an HXR croisette with Zimbabwean copper. In addition, data on the bun, bar, and musuku ingot types shows that a counter flow of ingots from Phalaborwa Mine in South Africa existed and transported copper ingots to areas of South Africa and northern Zimbabwe. The results presented in this poster will build on recent copper provenance studies in central and southern Africa, and will make a significant contribution to the field of southern African archaeology by highlighting the spatial and temporal extent of intra-African exchange/interaction networks, particularly between regions previously viewed as disparate.

**Stephens, Katharine (University of California, Riverside), Kenichiro Tsukamoto (University of California, Riverside) and Kelsey Sullivan (University of California, Riverside)****[104]***Preliminary Results of the Royal Palace at El Palmar, Mexico*

In this paper, we present preliminary results on the spatial organization and material remains associated with the royal palace at the Classic period Maya site of El Palmar, Mexico. An airborne lidar survey in combination with ground topographic mapping that covered the Main Group of this site revealed a palatial complex that extended over 10,000 m<sup>2</sup>. Located in the northwest section of the group, the complex is composed of enclosed courtyards and vaulted structures along with associated plazas and pyramidal temples, an architectural configuration indicative of Classic period palace complexes (250–800 CE). During the 2009 and 2018 field seasons, nine test pits were excavated in areas associated with the royal palace; two test pits were placed in a palace courtyard, one in the restricted Plaza G, one in a small plaza behind the palace, and five in the larger Plaza E beneath altars and stelae. Ceramic analyses together with AMS <sup>14</sup>C dating built a preliminary chronology of the royal palace and its associated activity areas. The preliminary results provide clues to the economic aspect of El Palmar ruling elites and will guide future excavations of the royal palace.

Stephens, Katharine [54] see Cap, Bernadette

**Sterner, Katherine (Towson University)****[227]***Lithic Practice in Times of Transition: A Comparison of Assemblages from Late Woodland and Oneota Structures at the Entire Road Site (47WN0562)*

The transition from the Middle to the Late Woodland period in the Midcontinent is marked by an obvious shift in lithic utilization strategies. People ubiquitously turned to local raw material acquisition, expedient tool technology, economization in production, and utilitarian tools during the Late Woodland. The transition from Late Woodland to Late Prehistoric lithic practice is less easily

identifiable. The same lithic traits that typify Late Woodland assemblages can also be applied to Oneota, Fort Ancient, Langford, and Middle Mississippian assemblages as well. The lack of lithic criteria differentiating one archaeological tradition from another during this time period has led to a dearth of literature on lithic practice after the end of the Middle Woodland. However, a fine-grained analysis of lithic assemblages from five Oneota and two Late Woodland structures at the Entire Road site (47WN0562) in northeastern Wisconsin indicates that subtle differences in lithic use do exist. These data provide the first robust comparison of Late Woodland and Oneota lithic practice at a continuously occupied site.

**Sterrett-Krause, Allison (College of Charleston)**

[132]

*Formation Processes and Family Preferences: Glass from a Non-elite Neighborhood in Pompeii*

Glass vessels of the 70s CE, and other household furnishings found in elite houses in Pompeii, have long received scholarly attention. Not all residents of Pompeii, however, lived in large houses decorated in the latest styles and furnished with luxury wares. Recent excavations by the University of Cincinnati's Pompeii Archaeological Research Project: Porta Stabia have revealed new details of life in a non-elite neighborhood near the city's main southern gate prior to the Vesuvian eruption of 79 CE. Careful contextual and typological study of glass fragments from 10 properties in this neighborhood reveals multiple archaeological processes at work. Though it has usually been assumed that glass found on a site was probably used and discarded there, much of the glass from the Porta Stabia excavations derives from construction filling layers, so understanding site formation processes is critical to interpretation. Variations in the properties' glassware assemblages, moreover, suggest that first-century CE consumers balanced competing demands when selecting glass vessels for personal or retail uses. Some households seem to have favored striking communal serving vessels, while households involved in retail food service may have selected mass-produced drinking vessels for their businesses and reserved more elaborate glass for family use.

Stevens, Bethany [175] see Arakawa, Fumi

**Stevens, Craig, Matthew Reilly (City College of New York) and Caree Banton (University of Arkansas)**

[80]

*The Making of a Black Republic: Liberian Labor in Transatlantic Context*

The nineteenth-century Back-to-Africa migrations to Liberia facilitated pursuits of freedom and autonomy for disenfranchised communities of the African Diaspora. Through their processes of settlement and statecraft, families labored to create productive spaces of dignity and respectability within a simultaneously foreign and familiar landscape. Towns such as Crozierville, founded in 1865 by Barbadian migrants, and Edina, founded in 1832 by southern Black Americans, were constructed and constituted through logics of racial capitalism and regimes of labor that were grounded in the plantation ideologies of nineteenth-century Barbados and the United States, respectively. Arriving in Liberia with agro-industrial prowess and a particular capitalistic industriousness cultivated in the Americas, migrants promptly established farms, distilleries, and trading ports, asserting themselves as leaders of a society worthy of geopolitical sovereignty and equality. Thus, the material legacies of the settlements, the settlers, and their descendants provide a West African case study to interrogate global perspectives of post-abolition and post-emancipation labor and communities. Through an examination of oral histories and material data, this paper will present entanglements of the people, products, and perspectives of Liberian settler communities, to exemplify the complexity of the Back-to-Africa migrations and identity formations in the nineteenth-century Black Atlantic.

**Stevens, Karen (University of Kentucky)**

[12]

*North American Indigenous Economies: Then. Now. Future.*

Producers of economic theory within North American archaeology overwhelmingly have a Western-flavored (i.e., Euro-American) worldview. While Indigenous archaeology continues to grow as a subdiscipline, the explicit integration of Indigenous voices and philosophies into other archaeological subdisciplines, such as economic studies, continues to lag. Studies of "hunter-gatherer/foragers" of the deep past often focus on evolutionary and behavioral ecology models, though humanistic approaches are emerging. In this paper, I examine how Indigenous/Native American voices are absent from the development of "hunter-gatherer/forager" economic theory and I posit that contemporary voice can shift perspectives going into the future. I model my discussion on an eternal/(re)generative spiral of reciprocity, in which the past (i.e., archaeology) can inform the present (i.e., contemporary Native American economics) and future, and vice versa. I discuss how contemporary Indigenous Entrepreneurship theory and the Quadruple Bottom Line (Community, Spirituality, Entrepreneurship, and Sustainability) can inform archaeological studies of the Archaic period in Southeast North America. By failing to incorporate contemporary Indigenous/Native American knowledges, pedagogies, and methods respectfully and reverentially into economic research, we continue to impoverish Western accounts of the deep past, while also neglecting the roles we can play as activist/accomplice scholars in the present.

Stevens, Karen [12] see Peres, Tanya

Stewart, Brian [155] see Bonneau, Adelphine

**Stewart, Caitlin (Cornerstone Environmental Consulting LLC), Edlin De Santiago (Cornerstone Environmental Consulting LLC) and Meredith Gilligan (Cornerstone Environmental Consulting LLC)****[215]***A Methodological Case Study of Field Identification and Differentiation of Plain Ware in the Sierra Anchas of Arizona*

The majority of the work performed in the Sierra Anchas, and information on the Anchan Tradition, is the result of Class III cultural resources surveys for federal contracts. These surveys often perform prehistoric ceramic field identification on a restricted timeline with individuals of varying levels of experience. A blind study was conducted using cultural resource professionals, of various levels, who are familiar with the cultural material of the region. Participants were provided a known sample of predominant plain wares found in the area and asked to correctly differentiate them. This paper discusses the efficacy and accuracy of field identification, with a focus on approaches for improving Anchan plain ware ceramic descriptions and training.

**Stewart, Haeden (University of Massachusetts, Amherst)****[205]***Representing Horror and Hope in Postindustrial Ruins*

In a world where industrial toxins seep into every landscape and DNA strand, industrial ruins archive a history of existential devastation. The histories of these landscapes, at once terrifying and compelling, belie the clinical forms of archaeological writing. Understanding the social and ecological stakes of postindustrial landscapes requires a mode of representation that captures the affective aspect of lives lived in toxic spaces, suffused with the persistent traces of a revenant past. In this paper I draw from creative genres of writing, particularly that of horror, to describe the toxic afterlives of Mill Creek Ravine, one of the first industrial areas in Western Canada. Now one of Edmonton's most popular urban parks, Mill Creek Ravine's waters and soils remain saturated with bones, concrete, and heavy metals from early industrialization. Produced by violent acts of colonial appropriation and industrial devastation, the decomposition of this waste has materialized an unsettling force, one that has harmed and compelled life (both human and nonhuman) in the ravine over the past century. This paper highlights the effects of a persistent material past and explores the particular stakes of industrial waste as a unique form of human/environment horror.

**Stewart, Jalynn (East Carolina University), Megan Perry (East Carolina University) and Bridget Cone (East Carolina University)****[161]***Mortuary Archaeology of the Nineteenth- to Twentieth-Century Rhem Family Vault in New Bern, North Carolina*

The excavation and study of nineteenth- and twentieth-century cemeteries in North America have not only illuminated shifts in mortuary behavior but also highlighted the lives of those invisible in the documentary sources, particularly women and children. However, unlike neighboring regions to the north and south, very few archaeological explorations of nineteenth- and twentieth-century cemeteries in eastern North Carolina exist. A gradual picture of life in this relatively rural segment of the East Coast is emerging through explorations of family vaults and cemeteries, largely initiated by their descendants. In 2019, the anthropology department at East Carolina University was asked by descendants of the Rhem family in New Bern to clear their family's ca. 1853 aboveground burial vault in preparation for restoration. This created the opportunity to study the material evidence for nineteenth- and twentieth-century burial practices as well as the human remains recovered from the vault during the 2021 field season. This presentation focuses on the material evidence for mortuary behavior during a rapidly changing period of funerary history in the United States in order to document how these trends were followed in a population center within a relatively rural context.

Shapit, Ina [27] see Church, Jason

Stibranyi, Máté [2] see Riebe, Danielle

**Stiner, Mary (University of Arizona)****[16]***Discussant*

Stiner, Mary [16] see Abell, Jordan

**Stokes, Robert (Eastern New Mexico University)****[86]***What Do We Need to Understand about the Types of Pottery Found in Caves and Rockshelters in the Mogollon Region?*

Professional investigations of numerous caves and rockshelters across the southern Mogollon Region have occurred since the 1930s. Understandably, the focus of research has been on the often-remarkable preservation of perishables (e.g., sandals, baskets, mats, wooden items) and food, specifically maize, items which often are not present at open-air sites. While these studies have contributed enormously to our understanding of the technology and use of these items, including when and where they first appeared and their subsequent spread, comparatively less attention has been paid to nonperishable items, specifically pottery as argued here. Most often, pottery is simply used to understand cultural affiliation and storage technology and needs, assuming that pottery typically functions in these ways at cave and rockshelter sites. This paper focuses on the occurrence of painted pottery at cave and rockshelter sites in the Mogollon Region and uses a comparative approach to understand where and when painted pottery occurs versus utilitarian plain wares and their contexts within these sites. Using the results of recent research at the Mares Rockshelter north of Las Cruces as a case study, I argue that the occurrence of painted pottery may bespeak ritualized and ceremonial activities rather than simple storage needs.

**Stoll, Marijke (Indiana University)****[123]**

*How Does One Reach the "City on the Hill"? Investigating Human Mobility in the High Elevation Environments of Oaxaca, Mexico*  
 Oaxaca is a landscape dramatically shaped by mountains. Over the past 30 years, researchers have increasingly used least-cost path (LCP) analyses in GIS to model how individuals would have traveled through different types of landscape terrains. However, problems arise when applying these analytical techniques to human mobility in rugged, high-elevation environments such as Oaxaca because first, they derive from principles of hydrology; and second, they assume that people avoid steep slopes because of high energetic or caloric costs. The intense occupation of the hilltops, ridgelines, and slopes of Oaxaca's hills and mountains demonstrates that people regularly traversed high energy-cost terrain, especially when they had to access food, water, and other needed resources, and/or when travel over easier, less costly terrain was impossible for sociopolitical reasons. This presentation explores how we can better account for the way people who live(d) in mountainous regions actually move(d) through them using ethnographic, survey, and spatial data, with the ultimate goal of improving research into past and present human mobility in high-elevation mountain environments.

**Stoll, Marijke (Indiana University)****[123]**

Chair

**Stone, Abigail (Illinois State University)****[6]**

Discussant

**[186]**

Chair

Stone, Jessica [19] see Napolitano, Matthew

**Storey, Glenn (University of Iowa)****[82]***The Disruptive Demographics of Collapse: Or, "Did Anybody See It Coming?"*

In 2017, Storey and Storey presented a definition of "slow collapse" that emphasized dramatic demographic decline as an almost sine qua non of the process of collapse. Although critical demographic decline in many famous cases of collapse seems undeniable, there are also cases in which population decrease is not so notable, but rapid changes do occur which have demographic effects. The concept of slow collapse was designed to acknowledge cases of collapse which seem more like transitions. However, reconsideration of several cases of collapse demonstrates that, despite the absence of serious population diminution, the transitional-appearing changes in play can trigger serious demographic consequences. Moreover, changing demographic characteristics occur on a timescale (within a single lifetime or a generation or two) that can easily escape the notice of the denizens of the collapsing cultural entity. Nevertheless, the demographic-related changes can have such tragic consequences in the long run that the negative implications of the use of the term "collapse" continue to hold as valid and warrant acknowledgement.

Storey, Rebecca [91] see Santiago, Tiffany

Stratford, Dominic [186] see Horn, Maryke

Stratford, Dominic [90] see Leader, George

**Strawn, James (University of Georgia), D. Shane Miller (Mississippi State University) and Derek Anderson (Mississippi State University)****[117]***An Update on Recent Fieldwork at Hester (22MO569), a Late Pleistocene / Early Holocene Site near Amory, Mississippi*

Excavation during the 1970s and the last several years at the Hester site (22MO569) located in northeast Mississippi have resulted in the recovery of temporally diagnostic artifacts associated with the Younger Dryas climate event. Hester is one of only a handful of sites outside of well-known cave sites in the region with an occupational sequence and organic preservation in Late Pleistocene/Early Holocene contexts. This potentially situates the site as a unique focal point for understanding hunter-gatherer adaptations in the wake of rapidly warming climate change. Until recently, existing spatial artifact data from earlier excavations has not been able to be integrated with the recent spatial dataset because the precise location of the 1970s excavations was unknown due to the removal of the original site datum. In this poster we present the fieldwork conducted to locate the boundaries of the earlier excavations allowing for a rare opportunity to conduct a spatial analysis of a 140 m<sup>2</sup> area at an early hunter-gatherer site in the Southeast, and the ability to target specific locations for subsequent fieldwork focused on gathering geoarchaeological, paleobotanical, and chronological information from the site.

Strawn, James [97] see Miller, D. Shane

**Strezewski, Michael (University of Southern Indiana)****[119]***The Mann Site 2022: New Insights into a Unique Hopewell Phenomenon in Southwestern Indiana*

The Mann site is, without a doubt, one of the largest and most important Middle Woodland sites outside of the Ohio Hopewell core area. Located in Posey County, Indiana, Mann encompasses 17 known earthworks, including a number of large and small geometric earthworks, two platform mounds, and at least eight burial mounds. Most unusual, however, is the presence of immense amounts of habitation-type debris at the site, in quantities rarely matched within the Hopewell world. Unfortunately, the Mann phase is chronically understudied, with the last major treatment dating to nearly 25 years ago. In the past few years, the author has undertaken a program of research at the Mann site and a number of Mann-related sites in the southwestern Indiana area. These data include information obtained from new excavations, geophysical investigations, and reexamination of old collections, coupled with a number of recent radiocarbon dates. These studies have shed considerable light on the nature of the Mann phenomenon, the timing and spatial extent of the habitation areas at Mann, and the site's relationship to other Hopewell manifestations in the Midwest and beyond.

**Strezewski, Michael (University of Southern Indiana)****[119]***Chair***Strickland, Keir and Robin Coningham (Durham University)****[218]***Continuity and Change: A Preliminary Study of Post-"Collapse" Urbanism in Late Mediaeval Sri Lanka*

Recent archaeological research at Anuradhapura has examined the emergence, form, and collapse of urbanism at Sri Lanka's first capital. This research describes a monumental urban core of elite residences, shrines, monastic complexes, and gigantic public architecture (from huge brick stupas to gigantic reservoirs) which was surrounded by an urban hinterland characterized by hydraulic features, small and short-lived settlements, and long-lived monastic sites that appear to have functioned as administrative and economic hubs within the wider urban landscape. However, following Anuradhapura's urban collapse in the eleventh century CE, both urban power and population move southeast to a new capital at Polonnaruwa. Here, we appear to see the Anuradhapura model of low-density urbanism implemented—but with potentially significant alterations to both settlement and administration within the wider urban hinterland. Combining historical data and the results of pilot-survey work in the Polonnaruwa hinterland, this paper presents a preliminary examination of continuity and change in urban form, settlement, and administration in late mediaeval Sri Lanka.

**Stricklin, Dominica and Shane Montgomery (University Of Calgary)****[210]***Comments on Methodologies and Comparison of Lowland Maya Population Estimates*

Population estimates in the Maya region guide our expectations and research direction, our inferences when interpreting other data, our insights shared with the public, and other disciplines. These estimates underpin assumptions in many conversations in Maya archaeology, particularly discussions of environmental impacts, economic and social changes, and extent of social inequality. Generation of population estimates is challenged by various potential issues (structural contemporaneity and classification, undetected structures, and household elasticity) that complicate our original goals but yield additional insights. We are excited by the rapid generation of lidar survey data, which has allowed colleagues and ourselves to generate larger and more comprehensive datasets. With these datasets, we expect population densities in the Maya region produced to be heterogeneous on a non-isomorphic landscape, with a shattered spectrum of variation from monumental city centers to ephemeral and flexible communities. We discuss current population estimates generated by Montgomery at Las Cuevas, Belize, and compare these to selected sites within the Lowlands. We will explicitly describe the known variation within these sites and other published data in the region. Finally, we will compare these estimates with other humid subtropical agriculturalists' population estimates alongside examples of selected densities.

Stringer Clary, Katie [196] see Dillian, Carolyn

**Stromberg, Kirie (UCLA Cotsen Institute of Archaeology)****[107]***Chair*

Stromberg, Kirie [107] see Wang, Zichan

**Stroth, Luke (University of California, San Diego), Mario Borrero (University of California, San Diego) and Geoffrey Braswell (University of California, San Diego)****[210]***A New Ceramic Analysis from Nim li Punit (AD 150/250 to 830+), Toledo District, Belize*

We describe the analysis of ceramic material from Nim li Punit (AD 150/250–830+), a small Maya center in the Toledo District of southern Belize, and emphasize chronology building and regional intrasite comparison. We evaluate the ways in which this collection is similar to and different from those of other southern Belize sites, including Lubaantun and Uxbenka, in terms of modal characteristics such as form and paste composition. We also highlight the benefits of structure-from-motion photography in

documenting individual sherds and complete vessels, facilitating comparison among ceramic collections without direct access to those materials.

**Stuart, David (University of Texas at Austin)**

[128]

*Winkil: The Nature of Personhood in Ancient Maya Religion*

This paper discusses the recent decipherment of a Maya hieroglyphic sign as WINIK or WIN(I)KIL, referring to a class of “supernatural” being that has so far gone unidentified in Classic Maya religion. The sign is extremely common, used in titles and designations for both living divine rulers and for beings from mythology who regularly assume human form, as opposed to other types of deities. These *winkil* have strong correlates in the language and spiritual belief of contemporary Maya communities, such as *winkir* of the Ch’orti’ Maya. Their identification in Classic Maya art may have a special pertinence to the complex of maize deities long discussed in Karl Taube’s work on Mesoamerican religion and iconography.

Stucky, Brian [85] see Delsol, Nicolas

**Sturdevant, Clark**

[159]

*Field-Related Career Interest Survey*

The lack of diversity in STEM careers has received significant attention. Few studies have focused on when students’ career goals are directed to or away from STEM fields in their education trajectory. This research examines the career interests of undergraduate students taking introductory courses in archaeology and physical geography. Students, both majors and non-majors, taking introductory courses offered at a regional comprehensive institution in the Midwest, completed surveys at the beginning and end of these courses. Results indicate that overall career interests in these disciplines increase from the beginning of the course, with 6% indicating that they are interested in a career in the discipline, to the end with 10% indicating interest. However, interest decreases in non-white students specifically with 10% initially expressing interest falling to 4.2% by the end of the courses.

**Sturm, Camilla (Barnard College)**

[82]

*The Shape of Resilience: Reimagining Complexity and Collapse in Neolithic China*

The emergence and disappearance of walled towns between 3000 and 2000 BCE in the middle Yangzi River valley, central China, is seen as a failed example of complex social formation. Unlike Neolithic societies of the Yellow River valley that “successfully” transitioned to statehood in the second millennium BCE, Yangzi River walled towns are cast as political dead ends: societies on the brink of statehood, wiped out by environmental disaster and regional conflict. This paper challenges the existing paradigm of complexity and collapse in the Jiang Han Plain of the middle Yangzi River valley. New data reveals that collective labor—not coercive elites—played a central role in the rise of these large, nucleated towns. As the region grew increasingly dry after 2500 BCE, rice farming households relocated to water-rich parts of the landscape, sparking the slow dissipation of Neolithic towns. Far from signaling collapse, residents compensated for the growing physical distance between households by developing new means of reinforcing core social values of collectivism and group participation. The Jiang Han case urges us to reimagine the archaeological correlates of complexity and collapse, and acts as an example of one society’s resilience in the face of a changing climate.

**Stutz, Aaron (Bohusläns Museum)**

[149]

*Residential Mobility, Logistical Mobility, and Social Network Connectivity in the Levantine Middle-Upper Paleolithic Transition*

The reconstruction of seasonal occupation patterns has long been a focus of prehistoric hunter-gatherer mobility studies. After all, we seek to understand variability in forager residential mobility across time and in diverse environmental settings. Yet, it is often close to impossible in Paleolithic cave deposits. This is because of the intricacies of sedimentation, repeated and superposed human occupations of unknown length, impacts from nonhuman animals in the cave, and chemical diagenetic factors stemming from moisture’s interaction with organic materials. Cave deposits may offer rich stratigraphic sequences and patches of extraordinary preservation, but site-formation processes are so complex that they often hinder easy interpretation of human behavior patterns. This presentation considers multiproxy archaeological data on human on-site and off-site activity in local environmental context at the Early Upper Paleolithic site of Mughr el-Hamamah, Jordan, ca. 46–34 ka cal BP. Instead of focusing on seasonality the analysis considers diversity in in-camp tasks and logistical foraging/provisioning. In this case study, the time-averaged perspective allows a consideration of changes in social networks, mobility, co-residence and in-camp task-patterns associated with anatomically modern populations—and the forager societies they constituted—in the Levantine Middle-Upper Paleolithic transition.

**Su, Xin (Harvard University) and Qiushi Zou (Wuhan University)**

[185]

*Underwater Exploration: A New Understanding of the Environment and Landscape of the Panlongcheng Site (1500–1300 BC) in Hubei Province, China*

Recent work at the early Shang period type-site of Panlongcheng in Hubei Province, China, has provided us with some new understandings of the landscape and water environment changes over time. In the past few decades, researchers have long believed that the environment and landscape of Panlongcheng we see today are no different from the early Shang period. However, recent archaeological discoveries indicate that there may still be some cultural remains underwater. Therefore, we used a

combination of underwater mapping, drilling, and excavation to expand our knowledge on the landscape of Panlongcheng during the early Shang period. This includes mapping the lake basin through single-beam echo sounders, drilling to preliminarily observe the stratum and collect samples underwater, and further excavation. The result indicates that the lake was formed not earlier than 1100 BC, which means that there might be no lake during the early Shang period. Therefore, the landscape and environment of Panlongcheng and other related issues should be reexamined.

**Subramaniam, Nandini, Hannah Lau, Colin Quinn, Lacey Carpenter and Horia Ciugudean**

[71]

*Postmortem Funerary Practices: Bone Histology in Early Bronze Age Transylvania*

Histological and osteological analyses of human remains can be used to examine mortuary practices, pathology, and postmortem, perimortem, and antemortem modifications. This can provide information about experiences of personhood and how they translate into broader community-based experiences surrounding death and its relationship to the living. This study takes a multidisciplinary approach to the taphonomic analysis of human remains from Early Bronze Age Transylvania (ca. 2700–2000 BCE) to provide additional data on the postmortem modification occurring at this site. I aim to re-create possible skeletal modifications from mortuary practices on pig remains. Once the remains are modified, I will bury then excavate them and conduct a histological analysis of thin sections along with thin sections of the human remains from Transylvania. This quantifiable and replicable comparison can be used to examine the sociopolitical and cultural structures that inform variation in mortuary modifications. A secondary interest would be evaluating how histology can inform the effect of soil composition on taphonomy. This analysis altogether can provide information about the effect of burial processes on the recovery of human remains at archaeological sites.

**Sugiyama, Nawa (University of California, Riverside), Karl Taube (University of California, Riverside), Saburo Sugiyama (Arizona State University and Okayama University) and Ariel Taxis (Universidad de las Americas Puebla)**

[163]

*Pilgrimage from Center to Periphery: Petrographic Data from Cerro Patlachique*

Cowgill's definition of the urban landscape highlighted the interdependence and circulation of people, resources, and ideas between the urban core and hinterland. In this presentation we provide preliminary interpretation of a large corpus of petrographic monuments, 35 in total, discovered through lidar mapping and extensive pedestrian survey in the Teotihuacan Valley. The locality of these petroglyphs on the southern Patlachique mountain range indicates this area was a place of periodic sacred pilgrimage to a mountain shrine. We note the presence of both imperial Teotihuacan styles, including elements of writing and calendric system, alongside more expedient designs. Evidence of the same piece being augmented and revised demonstrates sustained intervention as the Teotihuacanos revisited these monuments during key intervals of the year. The consistency of Tlaloc and female fertility representation suggests these petroglyphs were an inalienable part of the local landscape related to water/fertility worship. We must document and protect these petroglyphs that we know have already undergone looting and degradation.

**Sugiyama, Nawa (University of California, Riverside)**

[163]

*Chair*

Sugiyama, Nawa [201] see Aguayo, Esther

Sugiyama, Nawa [163] see Clayton, Sarah

Sugiyama, Nawa [163] see Sugiyama, Saburo

**Sugiyama, Saburo (Arizona State University), Nawa Sugiyama (University of California, Riverside), Kazuhiro Sekiguchi (National Astronomical Observatory of Japan) and Kuninori Iwashiro (ScienceNODE)**

[163]

*A New Approach for the Cognition of Time, Space, and Rulership in the Cosmic City of Teotihuacan*

One of Cowgill's main interests was how to archaeologically document the central factors triggering urbanism at Teotihuacan through a rigorous, materially focused approach. As part of our new multidisciplinary project "Integrative Human Historical Science of 'Out of Eurasia,'" we expand on his legacy by exploring the materiality of ancient cognitive systems. Our 3D reconstruction of the ancient city modeled from precise architectural plans (AutoCAD and lidar map) covers an area of 165 km<sup>2</sup>, expanding the Teotihuacan Mapping Project survey region by 400%. The cityscape is experienced in virtual reality using an extension of Stellarium, an open-source planetarium, into a new program, ArcAstroVR, that was created in collaboration with the Japanese National Institute of Astronomy. In this virtual space, we are able to recognize the coordination of the city's symbolic city layout directly alongside the astronomical phenomena in real-time (including features like "bench-marks") to better understand the material intersection of time, space, natural features, and centralized political organizations which materialized their conceptualizations integrating into the cosmic city. We tentatively conclude that the Teotihuacan ritual center originally emerged from an early phase around AD 200 explicitly proclaiming an innovative worldview and divine rulership which were centripetal forces of urbanism.

**Sugiyama, Saburo (Arizona State University)**

[73]

*Discussant*

[163]

*Chair*

Sugiyama, Saburo [163] see Sugiyama, Nawa

Sukumaran, Prabhin [149] see Chauhan, Parth

**Sulca Huarcaya, Nils (Universidad Nacional de San Cristóbal de Huamanga)**

[189]

*Fuera de la Metrópoli: Una visión de las sociedades rurales en el departamento de Huancavelica durante el periodo del Horizonte Medio*

Wari (600-1000 dC), fue una de las sociedades complejas que se desarrolló a lo largo de los Andes Centrales alrededor de 400 años. Más allá, del modelo impositivo o no, que implantó Wari sobre otras sociedades, queda aún muchas interrogantes con pocas respuestas sobre la función de las sociedades rurales que coexistieron con los Wari, en cuyos espacios geográficos se evidencian rasgos estilísticos expresados en la cerámica, la arquitectura, la textilera, entre otros. Estos asentamientos que se ubican en diversos pisos ecológicos muy cerca y distantes de la metrópoli Wari ubicada en Ayacucho, respondieron a un conjunto de necesidades de la metrópoli, tal es el caso, de diversos asentamientos que se han identificado en diversas provincias del actual departamento de Huancavelica. La ocupación de este territorio constituye una muestra importante de las interrelaciones establecidas entre la urbe y la periferia con diferentes formas de organización local y el uso del espacio que estaría relacionado con su entorno medioambiental. A partir de casos documentados en Huancavelica, se hace un intento de explicación acerca de los mecanismos de interrelación desde una perspectiva fuera de la gran urbe que nos permitirá entender el modo de vida rural de estas sociedades.

**Sullivan, Kelsey (University of California, Riverside) and Kenichiro Tsukamoto (University of California, Riverside)**

[95]

*Ancient Maya Tool Production and Use of High-Quality Dark Brown Chert at El Palmar (Campeche, Mexico) and Its Hinterlands*

The ancient Maya used a variety of chert resources, which were abundant at and around the site of El Palmar in southeastern Campeche. One type of chert, a high-quality, dark brown chert, is a distinct lithic material used to make fine bifaces and eccentrics found at the site. Finished tools and flakes made of this material are most often recovered in elite ritual contexts. New research into lithic production at the Took' Witz group in the hinterlands of El Palmar suggests that some of these tools may have been produced by rural lithic specialists. In this presentation we discuss the results of excavations in the 2018 and 2019 field seasons at El Palmar and Took' Witz, along with all previous research conducted at the site. Specifically, we evaluate the distribution of production waste and finished tools made of dark brown chert. Our findings help to enhance the understanding of the community's acquisition of dark brown chert and the production of tools and their use at the site. We contextualize these results within the greater region, especially at the center of Calakmul.

Sullivan, Kelsey [104] see Stephens, Katharine

**Sullivan, Timothy (Corn Island Archaeology)**

[8]

*Fort Ancient Mortuary Landscapes: A Locational Analysis of Stone Box Burials in Central and Eastern Kentucky*

This study addresses the placement of Fort Ancient stone box burials in relation to features on the landscape and to settlement locations in Central and Eastern Kentucky. Patterns in the distribution of these features contribute to our understanding of Fort Ancient conceptions of the place of the dead within society and of the cosmological context in which Fort Ancient people lived. While stone box burials are generally associated with Mississippian culture, especially in the Cumberland Valley in Tennessee, this method of interment was also employed by Fort Ancient people in Central and Eastern Kentucky. This study also facilitates comparisons between Mississippian and Fort Ancient mortuary practices.

**Summers-Wilson, Rachel (University of Montana), Meradeth Snow (University of Montana) and Michael Searcy (Brigham Young University)**

[111]

*Mitogenome Analysis of Individuals Interred in the House of the Dead Complex at Paquimé (Casas Grandes), Mexico*

This research project investigates the unique burial complex from The House of the Dead at the archaeological site known as Paquimé (Casas Grandes), Mexico. Sometime during the Medio period (AD 1200–1450) at least 12 individuals were interred in a subfloor tomb that may have included two individuals that were high ranking. The nature of some of the burials suggests they may have been sacrificed and nonlocal. Combining mortuary, archaeological, and mitogenome data, we discovered new insights that broaden our knowledge on this elaborate and complex burial. The coalescence of the data also contributes to a better understanding of various elements of social organization at Paquimé, including evidence of inequality in prestige, rank, and power, and how this manifests in mortuary contexts.

**Sumner, Raymond and Reymundo Chapa (Center for Environmental Management of Military Lands)**

[56]

*A New Model to Operationalize Military Tribal Consultation*

DoD is one of largest federal landowners and users of airspace. As a result, DoD has extensive requirements to conduct tribal consultations. In general, tribal consultation within DoD is conducted from a US government perspective where each service and its installations individually engage tribal governments in accordance with federal law and service regulations. This consultation process places a great demand on limited tribal government cultural resource personnel and often results in conflicting approaches within DoD. The Center for Environmental Management of Military Lands, working with the US Air Forces Civil Engineer Center and Barry M. Goldwater Range–East, developed a proposal to “operationalize” the tribal consultation process in order to more effectively

utilize resources and allow tribal governments a greater role in directing the consultation process. The proposal centered on applying the concept of supported / supporting commands where a single installation would be identified as the lead command for engagement with each tribe. The supported command would then develop an MOA with the tribal government to address the specifics of the consultation process. Supporting commands would then coordinate their consultation activities with the lead installation. This in turn would establish a single command to report on consultation activities.

Sumner, Raymond [56] see Chapa, Reymundo

**Sun, Yufeng (Washington University in St. Louis)**

[185]

*Plant Stable Isotope Analysis Reveals the Water Management Strategies of Wheat and Barley in Early China*

The prehistoric food globalization initiated from around 5000 BP witnessed the exchange of principal crops domesticated at either end of the Eurasian landmass. In this process, farmers had to adopt different farming strategies facing the environmental and sociocultural challenges in novel landscapes. For wheat and barley, the proper water management strategies are the key to facilitate their eastward spread to China. The plant carbon isotope analysis ( $\delta^{13}\text{C}$ ) provides us the possibility to understand the water conditions of wheat and barley without in-site architectural remains of water management in early China. In this study, over 200 wheat and barley grain samples from over 20 sites (from around 4000 BP to 2000 BP) ranging from the westernmost province Xinjiang to coastal province Shandong were analyzed. The results suggest that wheat might be cultivated in oases or river valleys in arid non-monsoonal China with irrigation. Barley was treated similarly to wheat in non-monsoonal China but was probably enfolded into the indigenous rain-fed crop system when entering monsoonal China.

Sun, Zhuo [185] see Li, Yung-ti

**Sundstrom, Linea (Day Star Research)**

[146]

*Hero Twins and Morning Star: The Night Sky in the Iconography of Ritualized Warfare from Mexico to Montana*

Sacred stories of Hero Twins and Morning Star are illustrated in rock art throughout much of western North America. These rock art images suggest the widespread dispersal of a warrior cult during the two millennia before European contact. Constellations, planets, and patterns on the moon served to remind people of the stories, linking the worlds of the living and the dead. Ethnographic records and material culture items provide a key for recognizing the sky-dwelling warrior-heroes in rock art images.

**Sundstrom, Linea (Day Star Research)**

[171]

*Discussant*

Sunseri, Jun [41] see Peelo, Sarah

**Surovell, Todd (University of Wyoming)**

[120]

*The Myth of the Cryptic Colonizing Population, a Case Study from North America*

Inherent to the study of colonizing peoples in the archaeological record is the idea that the first archaeological traces of human colonization should be very difficult to discover. This notion is usually based on the reasonable assumption that small numbers of people spread thinly across a landscape should leave meager material traces. While I do not question that assumption, in this paper, I use modeling of human demography coupled with archaeological sampling to argue that founding human populations cannot remain cryptic for long, and that a robust archaeological record showing human presence should be evident within a few centuries of the arrival of an initial founding population. I examine this problem with specific reference to the colonization of areas of North America south of the continental ice sheets and argue that models of New World colonization that invoke a thinly spread and hard-to-find pre-Clovis population that persisted for millennia are flawed.

**Surovell, Todd (University of Wyoming)**

[120]

*Chair*

Surovell, Todd [120] see Allaun, Sarah

Surovell, Todd [57] see Franklin, Paris

Surovell, Todd [97] see Mackie, Madeline

Surovell, Todd [117] see Mahan, Chase

**Sutter, Richard (Purdue University–Fort Wayne) and Nicola Sharratt (Georgia State University)**

[217]

*The More Things Change, the More They Stay the Same: Estuquiña Ethnogenesis and Biodistance Results for the Late Intermediate Period (~AD 1250–1450), Moquegua, Peru*

Throughout the Andes, the Late Intermediate period is characterized by processes of population movement, displacement, conflict, and ethnogenesis. Within the upper Moquegua Valley, Peru, circa AD 1250, Estuquiña materials replaced earlier Tiwanaku-derived

styles, such as Tumilaca. The ancestry of the inhabitants of Estuquiña sites is central to our understanding the underlying causes of this shift. Prior research has posited that the Estuquiña represent an intrusive altiplano population from the east. Here we present biodistance analyses, based on the scoring of highly heritable nonmetric tooth traits from skeletal samples from two Estuquiña affiliated sites; namely the Estuquiña type-site, and Tumilaca-La Chimba. Comparisons with previously reported samples from the region indicate that both Estuquiña skeletal populations were directly descended from previous local Middle Horizon populations and that the stark changes in the archaeological record and material culture reveal shifting ethnic identities within the valley rather than the arrival of immigrants.

Suyuc, Edgar [11] see Hansen, Richard

**Suzukovich, Eli, III (Northwestern University)**

[142]

*Discussant*

Suzukovich, Eli, III [164] see Kelly, Jamie

Swanson, Steve [144] see Arp, Ryan

**Swenson, Edward (University of Toronto)**

[225]

*Ceremonial Architecture as Semiotic Machines*

Archaeologists have long recognized that symbolically charged places of a religious nature exhibit a remarkable “semiotic density.” However, the distinct semiotic affordances of ritual deposits in the archaeological record remain under-theorized. In this paper, I compare archaeological data obtained from the Moche temple of Huaca Colorada, Peru (AD 650–900) and from royally endowed *āśramas* (monasteries) founded by king Yaśovarman I (889–910 CE) in ancient Angkor. The comparison demonstrates how an analysis of the sign properties of ceremonial architecture and related “structured depositions” can permit interpretation of the underlying meanings and intended function of past ritual practices. My approach relies on both an examination of variations in the relationship between sign vehicles and objects (icons, indexes, symbols, etc.) in definable ritual contexts as well as a semiotic investigation of material repetition, substitution, and accumulation (exhaustion) characterizing specific building traditions and other archaeological remains, including burials and offerings. Ultimately, I analyze the Andean and Angkorian religious constructions as exceptional spaces of semiosis and cosmic renewal, powerful machines in the spirit of Deleuze and Guattari that assembled distinct political worlds.

**Swenson, Edward (University of Toronto)**

[225]

*Chair*

Wisher, Mark [198] see Mack, Joanne

Symanski, Luis [154] see Klokler, Daniela

Symmonds, Molly [71] see Quinn, Colin

**Szpak, Paul (Trent University) and Eric Guiry (University of Leicester)**

[39]

*Improved Quality Control Criteria for Stable Carbon and Nitrogen Isotope Measurements of Ancient Bone Collagen*

The ratio of carbon to nitrogen atoms in bone collagen (C:N ratio) is the most widely used quality control (QC) indicator for stable isotope measurements of ancient samples. We present a model describing the relationship between the carbon and nitrogen isotopic and elemental compositions that accounts for the isotopic composition of the collagen and exogenous contaminants as well as taxon-specific information about the collagen amino acid composition. In some cases the traditional C:N QC parameters are applicable, while in others they can result in the inclusion of unreliable (altered) isotopic data primarily due to contamination from humic substances. Using new and previously published data on taxa commonly encountered in ancient studies, we further illustrate how using traditional C:N QC parameters may lead to the inclusion of altered isotopic compositions in real archaeological scenarios. We argue that the traditional “one size fits all” approach to the C:N QC criterion should be avoided and we outline new collagen QC criteria specific to certain taxa and environments on the basis of our model. These revised criteria will help to improve the interpretation of isotopic data by more accurately identifying samples with isotopic compositions altered by contamination.

Szpak, Paul [92] see González Gómez De Agüero, Adrián

Szpak, Paul [28] see Routledge, Jennifer

**Szremski, Kasia (University of Illinois)****[84]***Thriving in Liminal Spaces: Networks, Intermarriage, and Mutual Aid in the Huanangue Valley, Peru*

Drawing on the concepts of mutual aid (Kropotkin 1902) and entanglements (Dietler 2015), this paper looks at Chancay settlements in the Huanangue Valley of Peru's Norte Chico to explore how occupying intermediate spaces could enable small-scale *señoríos* to play outsized roles in both local and regional geopolitics. Chancay settlements in the Huanangue valley present a unique opportunity to examine these dynamics as they were doubly intermediate. The Huanangue Valley runs through the chaupiyunga, the ecological and cultural transition zone between the coast and the highlands, while the Norte Chico was on the southernmost frontier of the Chimú Empire. Using archaeological and ethnohistoric data, this paper argues that, at the local level, occupying the lower reaches of the chaupiyunga strengthened the cohesion between far-flung Chancay factions by forcing the activation of social and economic networks that tied chaupiyunga to coast. Likewise, on a regional scale, the Chancay may have leveraged intermarriage with the Chimú to gain special privileges from the Inca during the Late Horizon. In sum, the flexibility required to thrive in liminal zones like the chaupiyunga, or on the borders of empire, is part of what enables the resilience of small-scale *señoríos* during the LIP and beyond.

**Tabrett, Amy (University of Sydney) and Peter Hiscock (Charles Darwin University)****[120]***Settling Sahul*

Many models of the settlement of Sahul have been proposed. This paper reviews the current archaeological evidence for the arrival and dispersal of humans across the continent and evaluates the resolution and reliability of those data. We then use agent-based modeling to evaluate the plausibility and power of the key models that have been offered to explicate the settlement process. Our results provide novel insights into how we might think of the dispersion of modern humans across this land.

Taché, Karine [109] see Gates St-Pierre, Christian

**Taffere, Abebe (University of Florida), Steven Brandt (University of Florida), Elisabeth Hildebrand (Stony Brook University) and Benjamin Smith (University of Florida)****[76]***Lithic Technological Variability in the >50 ka Late Pleistocene Sequence of Mochena Borago Rockshelter, SW Ethiopia*

The African Late Pleistocene, particularly ~70–50 ka, is arguably a crucial period for understanding technological and behavioral change prior to and during the "genetically successful" expansion of modern humans out of Africa. Mochena Borago Rockshelter in SW Ethiopia is one of the few well-dated, stratified sites with potential to provide archaeological data from this critical time period. Recent excavations in the central sector, MB5, have exposed >1.5 m of stratified deposits >50 ka. Two major stratigraphic groups of cultural deposits containing lithics, ground stone, and ochre (earlier W-Group, and later U-Group) are separated by a sterile volcanic layer. Chronometric dating >50 ka has been unsuccessful so far, but stratigraphy and overlying radiocarbon dates suggest W-Group may date to >60 ka and U-Group >50 ka. Preliminary lithic analysis shows continuity and gradual changes in core reduction technology. Production of unifacial and bifacial points, and both linear and recurrent cores with unidirectional, bidirectional, opposed, and centripetal exploitation, were common methods used to manufacture varied Levallois products in W-Group and U-Group. However, the appearance of Nubian elements, backed pieces, and bipolar technology in U-Group indicates new technological strategies and activities. These and other behavioral changes may have helped hunter-gatherers adapt rapidly to a wide range of new environments.

Taffere, Abebe [76] see Smith, Benjamin

Talbot, Thomas [97] see Nash, Brendan

Tamoría, Raveena [50] see Praet, Estelle

**Tantaleán, Henry (Universidad Nacional Mayor de San Marcos)****[192]***Los Paracas y las esferas de interacción*

Durante el primer milenio antes de nuestra era, la costa sur del Perú experimentó una serie de fenómenos sociales significativos que incluyeron el surgimiento de sociedades complejas, el desarrollo de monumentalidad y la creación de ideologías de alcance regional. En la actualidad, nuestro programa de investigaciones (PACH), enfocado en el valle de Chíncha, ha generado una importante cantidad de datos arqueológicos y arqueométricos que posibilitan una reconstrucción histórica muy detallada de este período de tiempo. En ese sentido, muchos modelos históricos, arqueológicos y antropológicos han sido planteados a lo largo del siglo XX y comienzos del siglo XXI. Sin embargo, de todos ellos, el modelo de "esferas de interacción" planteado a finales del siglo XX por Richard Burger permanece prominente en las explicaciones arqueológicas y como una importante herramienta heurística para dar cuenta de fenómenos sociales a escala regional e intrarregional en esta época. En esta ponencia se contrastan nuestros datos y su modelo para comprender la vigencia y contribución de su propuesta.

**Taube, Karl, Travis Stanton (University of California, Riverside) and Yun Ge (University of California, Riverside)**  
**[156]**

*Living Mountains: Cosmology, World Directions, Centering, and Community in Ancient Mesoamerica and East Asia*

Perhaps taken for granted, mountains quietly but powerfully dominate the living landscape of humans on a daily basis. As a way of codifying and organizing the world, mountains in Mesoamerica delineate the cosmos, with four marking the world directions, along with the calendric “year-bearers” denoting a constant succession of four day names in a counter-clockwise motion for the 365-day year. By framing the world, mountains set humanly lived space in order, in contrast to chaos beyond their borders. In Mesoamerican Indigenous thought, they are sentient, living beings and this concept of mountains with world directional symbolism as protective entities is present in the American Southwest as well. However, this complex of mountains and cosmology, especially world directions is still more extensive, and as we will note, was present in ancient China as well. In this paper we will compare these separate, but similarly organized traditions.

Taube, Karl [163] see Clayton, Sarah

Taube, Karl [163] see Sugiyama, Nawa

**Tavera Medina, Ana Carito (Instituto Peruano de Estudios Arqueológicos), Estefany Campos (Universidad Nacional Mayor de San Marcos) and Aaron Grados**

**[29]**

*Extendiendo fronteras agrícolas, campos de cultivo en tiempos Chimú: Quebrada del Oso*

En el marco de la Temporada 2020 del Programa Arqueológico Chicama se realizó la prospección de la sección media de la margen sur del valle del mismo nombre. Entre los asentamientos estudiados se abordó el sitio de Quebrada del Oso, “centro administrativo” de filiación Chimú. Durante los años de desarrollo de esta sociedad, debido a la importancia de la agricultura, se llevaron a cabo grandes proyectos de irrigación con el propósito de controlar las tierras agrícolas y fuerza laboral. A partir de las evidencias alfareras, campos de cultivo, obras hidráulicas y arquitectónicas, este trabajo se propone exponer cómo las políticas estatales chimú se reflejan en el sitio arqueológico de Quebrada del Oso.

Taylor, James [78] see May, Keith

**Taylor, Kathrine (Southwest Archaeology)**

**[175]**

*Diversifying and Decolonizing*

The diverse student population and faculty of the Archaeology Southwest / University of Arizona Upper Gila Preservation Archaeology Field School (UGPA) is one example of a larger shift in our field; archaeology is becoming increasingly diverse through the inclusion of marginalized peoples and through the critique of canon narratives that often occlude or erase the perspectives and cultural nuances of marginalized groups. Diversifying includes ensuring accessibility—ensuring access to archives and scholarly writing, offering opportunities to receive an education related to this field, and executing outreach projects that encourage a public perception that archaeology can have clear impacts for local community members and not just archaeologists. Such progress can be made through current public interest in how history and archaeological efforts are discussed in classrooms, efforts to spread academic writing through social networking services, and an awareness of the lack of representation of marginalized persons in archaeology.

**Taylor, William (University of Colorado–Boulder), Juan Belardi (CONICET—Universidad Nacional de la Patagonia Austral), Flavia Carballo Marina (Universidad Nacional de la Patagonia Austral), Luis Borrero (CONICET—Universidad de Buenos Aires) and Emily Lena Jones (University of New Mexico)**

**[92]**

*Early Domestic Horse Exploitation in Southern Patagonia: Archaeozoological and Biomolecular Evidence from Chorrillo Grande, Argentina*

The introduction of domestic horses (*E. caballus*) following Spanish colonization transformed Indigenous societies across the grasslands of Argentina, leading to the emergence of specialized horse cultures across the Southern Cone. However, the relatively late arrival of permanent European settlement in Patagonia means that the dynamics of this introduction are poorly chronicled by historic records. Here, we apply archaeozoological and biomolecular techniques to horse remains from the site of Chorrillo Grande, located in the steppe, along the middle Rio Gallegos in Santa Cruz province, southern Argentina. Osteological and taphonomic analysis of horse remains from this site suggest that horses were pastorally managed and used for food by Aónikenk/Tehuelche people, and radiocarbon dating shows that horses were present at the southern continental margins as early as the mid-seventeenth century. These results reinforce the extremely rapid Indigenous mediated dispersal of the domestic horse in South America and demonstrate that horses catalyzed transformations to native lifeways immediately upon their introduction to southern South America.

Taylor, William [122] see Bethke, Brandi

**Taylor Riccio, Kia (Syracuse University) and Douglas Armstrong (Syracuse University)**

**[44]**

*Foodways and Hidden Histories in Seventeenth-Century Dominica*

This presentation discusses the early stages of ongoing archaeo-gastronomic research at the La Soye Complex in Dominica. Our projects, including the one discussed in this talk, focus on environmental and social dynamics between the indigenous Kalinago

people, European settlers, and island ecologies. Through a blend of mass spectrometry and starch analysis, this research aims to discover indexes of identity and social cohesion in an early quasi-colonial landscape. La Soye is an (at times illicit) seventeenth-century trading post on the northeastern coast of Dominica. After a treaty in 1660 banned foreign settlement on the island, La Soye's residents flirted with the boundaries of colonial law. The enclaves' Kalinago inhabitants and European immigrants lived and operated in a peripheral ungoverned landscape. Thus, the La Soye complex presents a unique opportunity to study the colonization of a hidden Caribbean frontier, and recovering the culinary habitus of the La Soye Complex reveals the impacts of ecocultural exchange and friction within the Lesser Antilles.

Tazza Ulloa, Alejandra [217] see Muñoz Rojas, Lizette

Terradas, Xavier [98] see Belmiro, Joana

Tessone, Augusto [157] see Barberena, Ramiro

Taxis, Ariel [163] see Sugiyama, Nawa

**Thacher, Dana (McMaster University)**

[17]

*Remembering Sarah, William, and Mary: Gendered Patterns of Adolescent Commemoration in Victorian and Edwardian England*  
Adolescence is widely recognized as a liminal stage between childhood and adulthood but the actual age this period encompasses is highly context specific. Not only does it vary between social groups but there is also significant variation within such groups. This is a particular challenge for archaeologists because the study of a single archaeological context often yields small sample sizes that prevent the exploration of the intricacies within the adolescent period. Drawing on a database of 13,598 individuals between the ages of 3 and 30, this paper utilizes burial records, monument inscription records, and census data for all rural parishes in Cambridgeshire, England, from 1845 to 1925 to explore the complex interrelated effects of age at death, gender, socioeconomic status, and year of death on the likelihood of an adolescent being buried with a stone monument. What I found was that while commemoration rates for boys steadily increased through adolescence and reached young adult rates in the late teenage years, girls reached young adult commemoration rates much earlier, in their preteens. This disparity suggests that the experience of adolescence in Victorian and Edwardian England varied significantly by gender and questions whether girls even had an adolescence period.

**Thacher, Dana (McMaster University)**

[17]

Chair

**Thacker, Paul (Wake Forest University)**

[162]

*Seeing Red: Paleolithic Color Aesthetics, Pigment Production, and Pyrotechnology at Vale de Óbidos, Portugal*

A large assemblage of red ochre fragments was recovered during high-resolution excavation of the well-preserved, open-air archaeological site of Vale de Óbidos. Microscopic residue analysis of stone tools from the site demonstrates ochre was used in the scraping and preparation of hides. But iron oxide minerals were not purely chemical or abrasive additives; a common color aesthetic unifies diverse techniques of fashioning pigments from different geological materials. Goethite-rich sandstone and conglomerate cobbles from deflated pavements of the Sesmarias hillslope were carefully heated in a controlled, oxidizing environment to dehydrate yellow-brown goethite to red hematite. This evidence for sophisticated pyrotechnical techniques during the Upper Paleolithic likely indicates specialized knowledge or skills possessed by certain group members. The practices of pigment production at Vale de Óbidos are robust sources of information for evaluating anthropological questions of cultural transmission, *chaînes opératoires*, and the emergence of labor division during the Late Pleistocene.

Theiss, Hank [122] see Davis, Dylan

**Theler, James (University of Wisconsin LaCrosse)**

[52]

*Freshwater Mussel and Fish Remains from the Joy Creek Major Site*

This paper considers freshwater mussel shells (>100s) and fish bones (>1,000s) recovered during salvage excavations at the Joy Creek Major site (13PM7) located adjacent to the lower Big Sioux River, in Plymouth Co., Iowa. These assemblages are interpreted to represent locally available, seasonal dietary supplements for the site's Mill Creek inhabitants. Three mussel species, the mapleleaf (*Quadrula quadrula*), pimpleback (*Cyclonaias pustulosa*), and the pink heelsplitter (*Potamilus alatus*), together comprised 77% of the assemblage. These species prefer a muddy sand, gravel, cobble substrate under flowing water. The channel catfish (*Ictalurus punctatus*) is the most abundant species in the fish assemblage and prefers larger streams having low to moderate current. It is a primary host for the larval stage of above listed mussels. The essential role of specific fish species as obligatory host for freshwater mussel's parasitic larva, the glochidia, is discussed in relation to the fish and mussel species recovered at the site.

Lastly, comparisons are made with other regional late prehistoric site assemblages and historically reported species distributions in the lower Big Sioux River.

**Thomas, Ariane (University of Iowa), Alida de Flamingh (University of Illinois), Kelsey Witt (Brown University), Matthew E. Hill (University of Iowa) and Ripan Ripan (University of Illinois)**  
[68]

*Ancient DNA Evidence Suggests Dogs as Commodities of Exchange at Jamestown Colony*

While dogs have held pragmatic and symbolic roles in Native societies throughout the Americas, the early confluence of Native and European dogs during colonization and its effect on human cultures is a poorly documented aspect of colonial impact. To further explore the relationships between humans and their dogs in colonial North America, we generated two mitogenomes from dog teeth sampled from one of the earliest European sites in the Americas, Jamestown Colony, Virginia, dated from 1609 to 1619. Genetic analysis demonstrated that the Jamestown dogs have dog mitochondrial DNA lineages indigenous to the Americas, and these lineages are most closely related to dogs from a Hopewell period site in the Midwest. In conjunction with historical and archaeological evidence, we infer that both Indigenous and European dogs could be valuable commodities that were traded between the Powhatan and English for political and economic purposes. Furthermore, we identify the transience of this power in dogs during periods of immense physical stress experienced by Jamestown residents. Importantly, this study advances long-standing questions about the use of dogs during major demographic events.

Thomas, Ben [190] see Langlitz, Meredith

Thomas, Charles [24] see Campbell, Janice

**Thomas, David (American Museum of Natural History)**  
[121]  
*Discussant*

**Thomas, Jayne-Leigh (Indiana University)**  
[180]  
*Discussant*

Thomas, Jayne-Leigh [159] see Sievert, April

Thomas, Jonathan [20] see Lillios, Katina

**Thomas, Prentice, Janice Campbell (Prentice Thomas & Associates Inc.), Nate Mountjoy (Prentice Thomas & Associates Inc.) and Aemie Nash (Prentice Thomas & Associates Inc.)**  
[4]

*Rethinking the Late Archaic, Early Deptford, and Elliott's Point Rabbit Hole in Northwest Florida*

No period in the prehistoric sequence of northwest Florida needs a do-over more than the Late Archaic, which for 60 years has been filtered through the "cultural" lens of the Elliott's Point Complex as a panhandle manifestation of the Poverty Point Complex of the lower Mississippi Valley. The Elliott's Point Complex was proposed in the late 1950s by Dr. William Lazarus based on work at 8OK10, which produced hand-molded baked clay objects in contexts suggesting a Late Archaic affiliation. Collaborating with professional archaeologists like Florida State University's Dr. Charles Fairbanks and Poverty Point scholar Dr. Clarence H. Webb, Lazarus gave definition to characteristics of the Elliott's Point Complex and its relationship to the powerful Poverty Point trade network. The concept gained traction from multi-phase investigations at Eglin Air Force Base in the 1980s when large-scale survey and testing greatly increased the number of recognized Elliott's Point sites and a technical synthesis of the findings elevated the complex as culturally synonymous with the regional Late Archaic culture. This poster presents a revised characterization of the Elliott's Point Complex, reduced from embodiment of the Late Archaic culture to a specialized facet.

Thomas, Prentice [24] see Campbell, Janice

**Thomas, Sunshine and Neil Puckett (SEARCH)**  
[213]

*Bridgeline: Finding Buried Surfaces with Infrastructure Geotechnical Cores*

Waterways and adjacent floodplains were consistently attractive to past foragers because they offer access to both important resources and travel routes. These often-dynamic environments can bury or destroy past surfaces where the earliest evidence of foragers may be preserved. However, buried landscapes adjacent to waterways with archaeological potential are often below the depth of archaeological testing. In contrast, sediment samples that can be used to assess an area for stable buried surfaces are already collected by geotechnical engineers as part of bridge construction planning. Engineers use these tests to evaluate subsurface construction conditions. Geotechnical evaluations include soil descriptions that can be used concurrently with existing geological knowledge to evaluate areas adjacent to modern waterways for the presence of buried landscapes. The case-study presented here uses previously collected boring data along waterways in the Sabine River region to look for preserved buried

surfaces or buried horizons, which may contain cultural materials or be the target of cultural resource mitigation when replacing or rehabilitating ageing infrastructure.

Thomas, Sunshine [213] see Puckett, Neil

Thomas, Brad [141] see Bosco, Samantha

**Thompson, Amy (University of Texas at Austin), Gary Feinman (Field Museum of Natural History) and Keith Prufer (University of New Mexico)**

**[54]**

*Measuring Inequality: The Effect of Units of Analysis on the Gini Coefficient*

Inequality, to some degree, is present in all human societies, but how archaeologists measure inequality varies greatly. In recent research, we have used the same unit of analysis, house size, to evaluate residential wealth inequality among the Classic (250–800 CE) Maya of southern Belize. Using a Gini coefficient, we found that even in this peripheral region, high degrees of inequality were present. However, nuances in inequality vary based on the measurement of analysis—area versus volume—and the unit of analysis—individual residential structures, all structures within a household group, or the entire household group including the built environment. In general, Ginis calculated from volume are greater than those from area, and the unit of analysis affects the Gini coefficient and thus our interpretations of the degree of inequality. We discuss the impact of the unit of analysis within this “simple” category of house size on our interpretations of residential wealth inequality in the past. These findings are important to understanding variations in wealth inequality through house size in ancient and modern societies alike, highlighting the value of clear definitions of the unit of analysis.

**Thompson, Amy (University of Texas at Austin)**

**[54]**

*Chair*

Thompson, Amy [159] see Gonzales, Mikayla

Thompson, Amy [78] see Kirk, Scott

**Thompson, Christine (Ball State University), Kevin Nolan (Ball State University) and Rebecca Barzilai (Ball State University)**

**[113]**

*Unearthing a Half Century of Archaeological Research in Indiana: Digitizing the Report of Investigations and Archaeological Report Series, and Associated Diagnostic Artifacts*

With funding from the Council on Library and Information Resources, Ball State University's Applied Anthropology Laboratories is executing multi-year project digitizing over 50 years of archaeological research, making significant Indiana archaeological data readily accessible for the first time. We will share our status, challenges, successes as we enter the second year of this project. These legacy collections include 18 Archaeological Reports and 110 Reports of Investigations (AR/ROIs) from 1965 to present. AR/ROI reports and maps are currently being scanned, digitized, and redacted; and 4,000 of the most diagnostic and culturally identifiable artifacts associated with these AR/ROIs are being 3D-scanned and photographed. All reports, maps, and artifact images will be uploaded into the Digital Archaeological Record (tDAR) with artifact models shared on Sketchfab. These AR/ROIs cover Indiana's long occupation history from the earliest (~11,500 BC) precontact American Indian land-use and ceremonial behaviors through frontier military engagements, historic American Indian village/settlements, and twentieth-century farmsteads. These difficult to access and underutilized collections contain valuable information for the public, American Indian scholars, historians, and ethnohistorians throughout the Midwest and nation.

**Thompson, Christopher**

**[65]**

*Mapping the Movement of the Riverton Culture during the Terminal Archaic*

The Riverton culture flourished in the Ohio River Valley and its tributaries during the Terminal Archaic period. This research seeks to look at the spread of Riverton spearpoints up the Ohio river and see if this appears to be the spread of a broader culture or an example of population migration. This paper controls for the movement of ideas and cultures with a large sample of calibrated radiocarbon dates displayed across a series of maps in order to display the spatial patterns of spear point usage. The preliminary conclusion of this research is the Riverton culture (or at least their lithic technology) originated in Illinois or Indiana and was moving up the Ohio river toward Pennsylvania from at least 1750–1300 BCE. The data obtained from this research is designed to enable the building of more accurate projectile point chronologies that factor in technological diffusion and migration.

Thompson, Gillian [162] see Waudby, Denis

Thompson, Jessica [26] see Cerezo-Román, Jessica

**Thompson, Lauri (Center for Archaeological and Tropical Studies [CATS]) and David Hyde (Western Colorado University)**  
[210]

*Evidence for Ritual Use at Two Hinterland Shrines at the Medicinal Trail Community*

Based on evidence from two Late to Terminal Classic ancestral shrines at the Medicinal Trail Hinterland Community in northwestern Belize, this paper discusses the social context of ritual use within non-urban households. Structure A-4 from Group A and Structure B-1 from Group B have been identified as ancestral shrines. Both structures have numerous burials, are monumental in size, and are located on the eastern side of their respective group. The ritual behavior exhibited at these structures includes obsidian blades for bloodletting and on the floor burning. Rituals are embedded with meaning for those that perform and participate in them, and have both social and economic effects within the community. This paper will explore the types of rituals practiced at non-elite rural communities, and, using archaeological, ethnographic, and ethnohistoric data from the literature, speculate as the function and purpose of hinterland rituals.

Thompson, Lauri [91] see Godhardt, Ava

**Thompson, Marc and Thatcher Rogers (UNM)**

[14]

*Analogs, Appropriations, and Analyses of Identities and Iconographies in North America's Extremadura*

Despite more than one and one-half centuries of investigations, archaeologists continue to debate the extent and form of relationships between Mesoamerica and what has been termed the Greater Southwest, now SW/NW. Some researchers recognize only minimal impacts from interaction. Others envision profound, expansive exchange of cultural and biological markers from Mesoamerica. We view contact and connectivity between and within this cultural area as multidirectional with intermittent and moderate magnitude. Rather than compare and contrast traits, we review biological and physical evidence for the migration/diffusion paradigm. Additionally, we address the foundations of common cosmologies and shared ideologies exhibited in Mesoamerica, northwestern Mexico, and the southwestern United States. Further we examine the appearance, rather than the arrival, of cognate motifs and icons on either side on the Mexican/US borderlands. Finally, there appears to be general agreement on the boundaries of this area, Las Vegas to Las Vegas, Durango to Durango. We challenge members of this session to develop a designation, a name befitting this multiethnic cultural area.

Thompson, Victor [79] see Garland, Carey

**Thomsen, Olivia**

[113]

*Immersive Imaging: A Digital Examination of Mealing Spaces in Chacoan Communities*

From the first stone laid in Chaco Canyon to our present day, both human and natural interventions have resulted in a pattern of continual change to great house architecture. Today, the National Park Service implements structural stabilization to Chacoan buildings to preserve them as cultural resources. In addition to these purposeful alterations, encroaching oil and gas extraction throughout the Southwest region threatens to disrupt the stability of these ancient structures. The continual metamorphosis of the Chacoan landscape, whether due to modern expansion or natural degradation, compels the need for more thorough recordation of our current view. To address this issue, I have implemented 360-degree imaging in select mealing spaces located within Pueblo Bonito, Aztec West, and Salmon Pueblo great houses. Access to these spaces in a digital format exemplifies the benefit and ease of recording rooms previously inaccessible to researchers via a digital platform. The focus of this project on large-scale mealing facilities will also enable future investigation of these female dominated spaces. Although we cannot reexamine the untouched archaeological record at these sites, immersive imaging provides a new approach to preserving the contemporary state of great house architecture.

**Thornton, Erin (Washington State University), Kitty Emery (Florida Museum of Natural History), M. Charlotte Arnauld (French National Centre for Scientific Research) and Arianne Boileau (Florida Museum of Natural History)**

[96]

*Good Things Come in Small Packages: A Unique Maya Cache from La Joyanca (Petén, Guatemala)*

Excavations at the Late Classic Maya site of La Joyanca (Petén, Guatemala) uncovered a cache of animal remains deposited within an interior construction phase of the site's western temple (6E12-sub). The faunal cache was interred along with a small piece of green stone in a shallow pit piercing a stucco floor in the structure's center room. Although faunal remains are common in Maya caches and burials, the Joyanca 6E12-sub cache is unique in its overall taxonomic diversity and emphasis on very small and/or subadult animals. The symbolic connotation of the cache's composition is considered through comparative ethnographic and archaeological evidence. The potential season of the cache's deposition and the time it would have taken to collect the items found in cache are also inferred from the life history traits of the species found within this ritual context.

**Thornton, Taylor (University of Toronto) and T. Max Friesen (University of Toronto)**

[78]

*Drones, Drives, and DEMs: Assessing the Usefulness of UAVs for Mapping Extensive Hunting Features in Remote Regions*

Caribou drive systems are among the many enduring features known across Inuit Nunangat (the Canadian Arctic). These networks of deliberately arranged stone features guided migrating caribou into predetermined areas where hunters efficiently dispatched their game. In the Kitikmeot region of Nunavut, previous surveys of caribou drive systems done in collaboration with local Inuit Elders gathered a wealth of information regarding the communal hunting practices of both Inuit (cal AD 1350–present) and earlier inhabitants of the separate Dorset tradition (100 cal BC–cal AD 1350). Despite their potential for study, only a few detailed examples

of these sites exist in the published literature. One reason for this is their sheer size: caribou drive systems are quite extensive and typically incorporate hundreds of individual stone features that stretch across the tundra for several kilometers. Knowing this, we tested the utility of consumer grade UAV technology during the 2019 field season of the Inuinnait Heritage Project. This paper presents original photogrammetric models, DEMs, and aerial photos of a caribou drive system (MeNI-3) near Bathurst Inlet/Qingauq, Nunavut. We discuss the advantages and obstacles of this accessible survey method and demonstrate its value for accomplishing thorough, yet rapid, survey results in remote regions.

**Throgmorton, Kellam (Crow Canyon Archaeological Center)**

[152]

*Recognizing Ancient North American Polities: Introducing Peoplehood to the Chacoan World*

What might an ancient Pueblo polity look like? What institutions, practices, and material evidence should archaeologists attend to as they seek to understand the spatial and temporal characteristics of political systems in the Native American past? Western political theory has traditionally formed the core of most models of political organization in Indigenous culture, but over the last two decades Native political scientists have presented alternative models for the organization of Native societies. One of these alternative models is Peoplehood. Peoplehood was a concept developed to explain the maintenance of distinct, sovereign, Native political identities within settler colonial nation states, but it provides important lessons for archaeologists considering ancient Native political systems, as well. It postulates that the shared ideologies, subjectivities, and dispositions that characterize a “people” are found in four relations—landscapes, language, histories, and ceremonies. In this paper I apply the Peoplehood concept to the Chacoan world. I argue that Peoplehood suggests an expansionist Chacoan polity that sought to bring many outlier communities into its political sphere, although the project was short lived and ultimately not successful.

**Throgmorton, Kellam (Crow Canyon Archaeological Center)**

[152]

Chair

Tibbits, Tawny [172] see Brouwer Burg, Marieka

**Tiesler, Vera (Universidad Autónoma de Yucatán) and Raúl López Pérez**

[48]

*Surviving the Sixth- to Seventh-Century Climatic Crisis: Reappraising Physiological Stress Markers in Early Classic versus Late Classic Maya Populations*

The interconnected explorations of the human condition, diet, and mobility surrounding climatic crises have established themselves as a critical research focus granted the obvious and far-reaching impact of climate change in today’s global society. This includes research on ancient physiological, biocultural, and social dynamics surrounding abrupt climatic fluctuations. Bioarchaeology, the scrutiny of archaeologically retrieved skeletal populations, offers a direct long-term perspective on past shifts in living conditions. In this paper we compare the living conditions and physiological stresses in Classic period inland and coastal Maya population who lived before the Middle Classic climatic crisis and discuss the shifts toward the later part of the Classic era. To this end, we confront multiple lines of evidence (caries, enamel hypoplasia, cribra orbitalia, spongy hyperostosis, and periostoses) in sexed adult individuals. Although differentially distributed among females and males, among coastal and inland residents, our findings point to a general increase in vulnerability and physiological stress burdens for those Maya who lived during the latter part of the Classic period.

Tiesler, Vera [209] see Hernandez-Bolio, Gloria

Tiesler, Vera [55] see Schieber G de Lavarreda, Christa

**Tiffany, Joseph**

[52]

*Examining Mill Creek-Mississippian Connections Reflected in Joy Creek Major (13PM7) Ceramics*

Preliminary analysis of the Joy Creek Major (13PM7) ceramics indicates a typical Big Sioux phase Mill Creek culture manifestation. Mississippian contact and interaction is reflected in locally made Stirling phase pottery and a few probable nonlocal items, all shell tempered. The unique site fortification and possible house basin remnants along with ceramics from several features provide the opportunity to provide contextual information lacking on Big Sioux phase studies in the past.

Tiffany, Joseph [52] see Lensink, Stephen

**Timmins, Peter (Western University)**

[28]

*The Dorchester Precontact Iroquoian Village: Dissecting a Spatial Archaeological Palimpsest*

The Dorchester Iroquoian village (ca. AD 1300–1400) consists of the remains of 17 longhouse structures and associated features comprising at least three partially overlapping occupational episodes. These remnant settlement patterns were preserved beneath the ploughzone of an agricultural field and were exposed in an open area CRM excavation conducted by Timmins Martelle Heritage Consultants Inc. in 2004 and 2011. While first impressions of the community pattern suggest the existence of distinct east and west villages surrounded by palisades, overlain by a series of later structures straddling both areas, a comparative analysis of the ceramics from the houses suggests a more complex history (Johnathan Freeman, 2019, Exploring the Occupational History of the Middle Ontario Iroquoian Dorchester Village site, master’s thesis, Western University). This paper describes the preliminary results

of research incorporating analyses of ceramic pipes, lithic and bone artifacts, AMS radiocarbon dates and settlement patterns in an effort to refine our understanding occupational history of the site and the lived experience of the Dorchester Iroquoians.

**Tizazu, Michaela Zewdu (University of Florida), Jonathon Reeves (Max Planck Institute), Matthew Douglass (University of Nebraska–Lincoln) and David Braun (George Washington University)**

[90]

*Core Reduction: A Novel Simple Geometric Approach to Measuring Reduction Intensity*

Measures of stone tool reduction have long been an important proxy for assessing mobility, technological decisions, and resource utilization in the past. Artifact reduction intensity refers to the amount of material that has been removed over its use-life. Several approaches have been devised to measure artifact reduction intensity. When applied to core forms, these studies rely on the presence or frequency of a series of technological features to indicate the degree of reduction. Many of these approaches are limited to specific timeframes due to the presence or absence of specific technological features also being dependent on the core reduction strategy. For example, many of the features used to infer core reduction intensity cannot be accurately assessed in bipolar cores. A measure of core reduction derived independently from technological features will allow greater applications across major archaeological time horizons. Here we investigate the potential of developing core reduction models using assumptions based in geometry independent of technology. We apply this technique to bipolar core reduction experiments to determine if original nodule size can be extrapolated from cortical surface curvature measurements. This method holds a promising future in understanding core reduction sequence and utilization movement using geometrical attributes independent of technology.

Tizazu, Michaela Zewdu [90] see Ruiz Menjivar, David

**Todd, Lawrence (GRSLE) and Daniel Dalmas (University of Utah)**

[51]

*Long-Term Landscape Scale Archaeological Research in Greater Yellowstone Ecosystem, NW Wyoming*

The Greybull River Sustainable Landscape Ecology (GRSLE) project has been investigating the higher elevation setting in the Absaroka Mountains, Greater Yellowstone Ecosystem in northwestern Wyoming since 2002. The project is an artifact-based, rather than site-based, study of chipped stone distributions. During the project's 20 field seasons, over 220,000 artifacts have had individual locational and descriptive attributes recorded at a mean elevation of 2795m. The project's goals include (1) investigation of the formational issues (landscape taphonomy) that impact our interpretations of high elevation archaeology and (2) linking evidence of human behaviors to other bio-physical aspects of landscapes such as big game migration corridors and ice patch dynamics. Examples of the artifact-based landscape scale research, landscape taphonomy, and investigation of corridors and mountain connectedness are presented.

**Tokovinine, Alexandre (University of Alabama)**

[48]

*Gaps and Narratives: Maya Accounts of the End of the Early Classic Period*

The ancient Maya political landscape underwent a major reconfiguration during the first half of the sixth century CE. A regional network of client and allied political regimes linked to the royal dynasty of Tikal and nonlocal hegemony likely based at Teotihuacan effectively ceased to exist and was replaced by a new system centered on the archaeological site of Dzibanche and its rulers. The political and ideological transformation was accompanied by profound changes in the material culture which marked the transition from the Early to Late Classic period. This presentation attempts to combine a broader analysis of frequency of Maya epigraphic records in 500–560 CE with an in-depth examination of textual and visual narratives at several archaeological sites. The data is contextualized by considering other possible references to social and natural calamities in the entire Classic Maya epigraphic record. The author argues that, while ancient Maya rulers were not keen to report failures of any kind, much may be glimpsed from gaps, omissions, and shared ways of describing the crisis and the political reconsolidation that followed.

Tokovinine, Alexandre [11] see Balanzario Granados, Sandra

Tokovinine, Alexandre [153] see Estrada-Belli, Francisco

Tokovinine, Alexandre [199] see Hannold, Cynthia

**Tolmie, Clare (Illinois State Archaeological Survey) and John Lambert (Illinois State Archaeological Survey)**

[164]

*The Lake Effect: Lake Michigan, Landscape Evolution, and the Archaeological Record of the Chicago Region*

Lake Michigan continues to have a major impact on the environment in the Chicago region, and changes in lake levels were a major driver of landscape evolution throughout the Late Pleistocene and Holocene. Fluctuating lake levels reduced or increased the extent and character of terrestrial resources. The landscape has also been altered by erosional and aggradational processes from near-shore currents and wave action. Interpretation of archaeological site and settlement patterns in this region requires an understanding of the factors that have shaped and continue to shape this landscape. In the Paleoindian and Archaic periods, foraging groups adapted to rapidly changing vegetation patterns and periods of lake transgression and recession which opened or closed new habitats. In the Woodland and Upper Mississippian periods lake levels stabilized, but the landscape continued to evolve with erosion and deposition of sediments along Lake Michigan shorelines. Evidence for lake level fluctuations over the last 12,000 years is available from a variety of datasets, including deep lacustrine sediments, ostracods, abandoned shorelines, and sand dunes. By synthesizing these data and utilizing GIS to reconstruct past lakeshores, we seek to better understand how people interacted with and adjusted to this dynamic landscape.

**Tolmie, Clare (Illinois State Archaeological Survey)****[164]***Chair***Tomazic, Iride (University of Michigan), Kara Larson (University of Michigan), Irina Arzhantseva (Russian Academy of Sciences) and Alicia Ventresca Miller (University of Michigan)****[23]**

*Resilience on the Silk Road: Isotopic Evidence of Herd Management Strategies at the Urban Site of Dzhankent, Kazakhstan*  
 Optimally located between the southern cities of Khorezm and northern sites along the Volga River, the urban settlement of Dzhankent in Kazakhstan was a notable locale for trade along intersecting routes of the Silk Roads. Occupied from the seventh through twelfth centuries CE, this locale was the residence of the ruler of the Oghuz nomads during the tenth century. While the subsistence economy of the site likely included domesticated grains and livestock, the strategies used to provision the urban population remain unclear. We argue that in the fluctuating environment surrounding Dzhankent, with varying availability of freshwater and Aral Sea resources, flexible animal management strategies were required. Carbon and nitrogen isotopic evidence from sequentially sampled sheep mandibular molars indicate diverse herd management strategies employed throughout the existence of Dzhankent. Hence, our work demonstrates responsive herd management strategies that maximized subsistence despite changing environmental and social conditions.

Tombret, Olivier [191] see Falgueres, Christophe

**Topic, John (Trent University)****[189]***Discussant***Tornquist, Gabrielle (University of Illinois at Chicago) and Bailey Kirsten (University of Illinois at Chicago)****[92]***Application of GIS and Google Earth in the Detection of Prehistoric Roads, Arequipa, Peru*

This study utilizes GIS applications and satellite imagery remote sensing to detect a complex network of prehistoric roads and trails located in the desert pampa of the Majes Valley, Arequipa, Peru. Beginning at least by the Middle Horizon period (600–1000 CE), both local populations and an intrusive Wari state contributed to the development of this road network. These routes linked the Andean highlands to the Pacific Ocean and established lateral connections between Arequipa's coastal valleys. Here we present a systematic approach to remote sensing for the study region where 2 km grids were overlaid on top of Google Earth satellite imagery to ensure 100% remote survey. Roads, trails, and associated sites such as way-stations, settlements, and geoglyphs were then recorded and exported into ArcGIS for further spatial analyses (e.g., cost-path analysis, visibility, slope). Building on prior work in the region, our results show that contrary to the inhospitable nature of the extreme arid Pampa, this zone is replete with archaeological resources in need of protection and further on-the-ground investigation.

**Torquato, Melissa and Erik Otárola-Castillo (Purdue University)****[40]***Expanded Temporal Windows When Examining the Effects of Climate Change on the Foraging-Farming Transition in Eastern North America*

Why did humans begin farming? Questions regarding the foraging-farming transition are some of the most important that archaeological science may answer. Scholars have proposed numerous hypotheses to explain this phenomenon, ranging from climate change to population dynamics to social processes. Through novel quantitative analyses, our previous research showed a significant effect of climate change on the independent domestication of native plants in the Interior Eastern Woodlands of North America during the Late Archaic period (approximately 4500–4000 BP). Thus, this research has provided evidence that climate change significantly affects the emergence of farming during the Late Archaic period. The present study expands on this work by reconstructing the paleoenvironment on an increased temporal window—from the Middle Archaic through the Middle Woodland. In addition, by increasing the time interval, this study captures the effect of climate change on the diet of indigenous communities before, during, and after the documented emergence of agriculture. These results expand our understanding of how climate change influenced the dietary trends in the prehistoric Interior Eastern Woodlands.

Torquato, Melissa [40] see Coon, Sarah

Torquato, Melissa [40] see De La Puente-León, Gabriela

Torquato, Melissa [40] see Denker, Erika

Torquato, Melissa [40] see Keevil, Trevor

Torquato, Melissa [40] see Otárola-Castillo, Erik

Torrás, Maria [220] see Moragas, Natalia

Torreggiani, Irene [125] see Gill, Lucy

**Torres, Josh (National Park Service)****[134]***Discussant*

Torres, Josh [166] see Curet, L. Antonio

**Torres Morales, Genesis, Feren Castillo-Lujan (Universidad Nacional de Trujillo, Peru) and Celeste Gagnon (Wagner College)****[29]***An Interdisciplinary Analysis of the Chimú at the Huacas de Moche during the Late Intermediate Period (AD 1000–1470)*

The Chimú (AD 1000–1470) were the second largest Andean empire. Emerging in the Moche Valley of Peru, the Chimú extended their reach from the northern border of Ecuador, south to the Chillón valley of Peru. They built their capital Chan Chan on an empty beach near modern-day Trujillo; however, the Chimú also interacted with the previously abandoned capital of the Southern Moche State—the Huacas de Moche. The Chimú remodeled the religious center of the site, and interred their dead in preexisting platforms at Huaca de la Luna, scattered throughout the urban sector. This research presents the archaeological findings of the Chimú cemeteries and a bioarchaeological analysis of 22 of these burials excavated from Huaca de la Luna or the urban center. The objective of this presentation is to bring an interdisciplinary perspective to the analysis of the Chimú period, comparing the discovery of other researchers in the region with our preliminary findings in order to comprehend the Chimú influence.

**Torres Vargas, Roberto****[145]***Prehispanic to Colonial Food Systems in the Eastern Lower Papaloapan Basin: A Perspective from La Sierra*

The southern Gulf Coast of México is a naturally affluent region where soil is suitable for many types of cultivation. In the region, land is mainly used for agriculture, where approximately 85% of the territory is oriented to said activity (INEGI 2019). In the Eastern Lower Papaloapan Basin (ELPB), one of the two most important economic activities is the sugar industry; its production occupies around 6660 ha of land. Maize cultivation covers only 1,560 ha, which brings up the question as to why the region primarily focuses on the sugar industry, and not in maize cultivation to provision these maize consuming families. Pollen record analyses in the region (Gorman and Byrne 1998) show that maize cultivation was practiced for over 3,500 years in the area, during the prehispanic era. Was maize farming a more sustainable economic activity for the regional communities before the arrival of the sugar industry? This paper presents a first perspective on land use at one site of the ELPB: La Sierra. During the first field season of the PAMLAS project, a series of data recovered from flotation and ceramic analyses provide some insights on the region's subsistence strategies during prehispanic and colonial times.

**Torrescano-Valle, Nuria, Alfredo Yanez-Montalvo and Gerald Islebe****[48]***Peten Campechano Evidence of Climatic Crisis from the Fifth through Seventh Centuries*

Paleoenvironmental records obtained in the Peten Campechano reveal a strong environmental adjustment between the fifth and seventh centuries. Pollen analysis and elemental geochemistry, in addition to the presence of ash, show the volcanic influence in the region during this period. Climate deterioration related to decreased precipitation in the circum-Caribbean region, changes in solar insolation, and changes promoted by volcanic activity had effects on the agricultural systems used. Increased maize production and decreased production of other crops indicate a strong intensive agricultural activity. Paleoenvironmental and archaeological evidence indicates that the Maya had achieved a great mastery of agricultural techniques; however, these climatic adjustments could have increased the pressure on the systems. The droughts of long duration (decades) were determinant for a productive decrease in the scheme of rain-fed agriculture. Even with efficient management and irrigation systems, environmental pressure was a strong contributor to cultural collapse. According to archaeological evidence, several cities collapsed in the seventh century. During the Middle and Late Classic period, these populations experienced more severe environmental changes than other sites in the Yucatán Peninsula. Maya agriculture from Peten Campechano depended on surface hydrology was greater in comparison with other zones and had greater effects on the population.

Torrini, Chiara [161] see Kasper, Kimberly

Torset, Kristine [141] see Antoniou, Anna

**Torvinen, Andrea (Arizona State University)****[150]***Collective Social Identities through Ceramic Production: A Techno-petrographic Analysis of the Assemblage from La Quemada, Zacatecas, Mexico (600–800 CE)*

The use of morpho-stylistic attributes to classify ceramic styles shared across Northwestern Mesoamerica has advanced our understanding of the occupational histories and social dynamics within and among the polities that developed during the Epiclassic period (600–900 CE). However, we lack data related to each stage in the manufacturing process, especially formation techniques (i.e., how the elements of a vessel are fashioned and pieced together to create a finished form). For example, previous research at the site of La Quemada, Zacatecas, identified a set of locally sourced petrographic fabrics that crosscut types associated with regional styles, suggesting that potters either used a wider variety of raw material sources when producing these types or that more than one potting community was producing them (Torvinen 2018). This paper addresses that question by re-classifying the La

Quemada assemblage using the *chaîne opératoire* approach to distinguish techno-petrographic groups and thus, more accurately characterize the sociological composition of the community. By prioritizing the enculturated behaviors that a potter learns within a community of practice over stylistic or economic choices, these results will contribute to anthropological theory by illustrating how collective social identities can be recognized and evaluated through ceramic production at La Quemada and beyond.

Toso, Alice [64] see Colonese, André Carlo

**Tostevin, Gilbert (University of Minnesota), Gilliane Monnier (University of Minnesota), Goran Pajovic (National Museum of Montenegro), Mile Bakovic (Center for Conservation and Archaeology of Montenegro) and Nikola Borovinic (Center for Conservation and Archaeology of Montenegro)**

[147]

*New Research at the Paleolithic Site of Crvena Stijena, Nikšić Municipality, Montenegro, within its Historical Context*

The rockshelter of Crvena Stijena (Nikšić municipality, Montenegro) is one of the most important Paleolithic sites in southeastern Europe. Its 20 m deep sequence of archaeological deposits spans the Middle Paleolithic through the Bronze Age. The Middle Paleolithic deposits themselves, which cover an astonishing 12 m in depth, contain one of the longest records of Neanderthal occupation in the region. Since its discovery in 1954, the site has been the subject of several major research projects; the data they have produced have helped make it a critical type-site for the Paleolithic in the Balkans. In this presentation, our goal is to introduce the aims and methodologies of the new research collaboration at Crvena Stijena that we established in 2016. We first present the site within the context of the Middle Paleolithic of the western Balkans and describe the history of research at the site. Then, we describe the research questions that are guiding our new investigations, and the methods we are applying in order to answer these questions while preserving as much of the site as possible for future generations of archaeologists.

**Totsch, Jessica (University of Missouri)**

[226]

*Water for the People: A GIS Analysis of the Spatial Distribution of Public Water Fountains in Pompeii, Italy*

In addition to its incredible levels of preservation, Pompeii has also been well-studied for its water-supply system. Although this system was not unique to Pompeii, the remains of the system that survived Vesuvius' destruction are an incredible resource for understanding access to clean drinking water in the Roman world. For instance, public water fountains fed by the Serino aqueduct, also known as the Aqua Augusta, can be found throughout the city. Much work has been done to understand the mechanics and construction methods of these public water fountains; however, little work has been done to analyze the location and distribution of these fountains and to understand how Pompeians would have accessed water on a daily basis. Using geographic information systems (GIS), the goal of this project was to identify the distribution of public water fountains to determine whether fountains were evenly distributed across the site, or clustered in certain areas or neighborhoods of Pompeii. In addition, this research explores how public water features were part of the wider context of Pompeii's urban planning and infrastructure.

**Toyne, Jennifer Marla (University of Central Florida), Donovan Adams (University of Central Florida), Andrea Rimpf (Ilok Town Museum, Ilok, Croatia), Mario Caric (Institute for Anthropological Research, Zagreb) and Mario Novak (Institute for Anthropological Research, Zagreb)**

[193]

*Dietary Patterns Can Be "Fuzzy": An Exploration of Stable Isotope Data from Late Avar Period Šarengrad, Croatia, to Explore the Complexity of Community Identity*

Cemeteries are assumed to represent a living community, wherein cultural practices, beliefs, and daily lives are shared among members. Similar interment location and patterns signal this shared existence, while grave goods may indicate some aspect of unique social identity. Osteological analyses and stable isotopes are used to model aspects of that shared experience, including diet. Categorical aspects of social identities that osteologists identify, including age and sex, often result in patterned variation with stable isotope analyses. We use stable isotopes of carbon and nitrogen from bone collagen to reconstruct past dietary patterns from the eighth to ninth century. Avar cemetery at Šarengrad and test expectations for a homogenous community. Additionally, we apply fuzzy clustering to isotopic data to explore relationships among individuals ( $n = 55$ ). This unsupervised method creates clusters of individuals and evaluates the degree of membership that can be evaluated based on archaeological variables (mortuary, osteological, etc.). While the fuzzified clustering of  $\delta^{13}\text{C}_{\text{col}}$  and  $\delta^{15}\text{N}$  indicates two clusters, which generally fall along broad age differences of young juveniles and the rest of the sample, the membership distribution invites further interpretations. This approach illustrates the potential of fuzzy logic analysis of isotopic variables to analyze coherency of cemetery samples and identify relationships among members.

Trabanino, Felipe [62] see McCormick Alcorta, David Rafael

Trabert, Sarah [122] see Bethke, Brandi

**Trask, Willa (Defense POW/MIA Accounting Agency), Emily Moes (University of New Mexico), Douglas Kennett (University of California) and Keith Prufer (University of New Mexico)**

[26]

*Mortuary Practices during the Late Paleoindian and Archaic Periods in the Southern Maya Mountains*

Emerging research from excavations at two rockshelters in the Maya Mountains of southern Belize, Mayahak Cab Pek and Saki Tzul, documents their regular use as mortuary spaces across nearly 10,000 years, spanning the late Paleoindian through to the Classic Maya periods. These rockshelters offer a rare cross-sectional look at mortuary practices focusing on a single area throughout the Holocene. To date, human remains representing ~20 individuals have been directly dated to the Late Paleoindian or Archaic periods (9600–3700 cal BP), with isotopic analyses suggesting a diet consistent with foraging in a lowland tropical forest. Analysis of the Paleoindian and Archaic burial features suggests people in this region utilized diverse practices for the treatment and deposition of their dead, including primary and possible secondary burials, cremations, and possible dismemberment. Furthermore, DNA results have identified several sets of relatives in the sample. Pulling in osteological, artifactual, DNA, isotopic, and contextual data, we explore funerary rituals in this area prior to the adoption of agriculture. Based on these data we examine the use of these rockshelters as mortuary spaces during the late Paleoindian and Archaic period times.

Trepanier, Jill [127] see Watt, David

**Trever, Lisa (Columbia University)**

[192]

*Art, Archaeology, and the Matter of Time in the Early Andes*

In Andean archaeology, images have been asked to do and to be many things. Seriated by form and style, they have been used as proxies for time, for cultural belonging, for political alliances, and for religious affiliations. As iconographic “texts” to be interpreted, they have been taken as transcriptions of ancient beliefs and practices. But in order to take seriously the methodological challenges of writing art histories for prehispanic—and especially pre-Inca—settings in the Central Andean region of South America, it is necessary to relieve images and other forms of artwork of the tautological burden of serving as their own chronological markers; to theorize more critically the relationships between material culture and social belonging; to recognize ancient historicity; and to take images not as windows onto the past but as rhetorical forms, which show the world not as it was but as their makers wanted it to be seen. In this paper, I explore how Richard Burger’s scholarship—including the rigorous development of radiometric chronologies, research on Chavín and its antecedents, and studies of artistic revival and archaism (these with Lucy Salazar)—have enriched the productive interstices of art and archaeology for the early Andes.

Trever, Lisa [129] see Koons, Michele

**Triadan, Daniela (University of Arizona) and Takeshi Inomata (University of Arizona)**

[153]

*Tracing the Origins of Maya Civilization: Archaeological Investigations at Ceibal, Guatemala and the Middle Usumacinta River Basin, Tabasco, Mexico*

With the generous support of the Alphawood Foundation, we have conducted research into the origins of Maya Civilization since 2011. Our projects at Ceibal in Guatemala, and more recently in the Middle Usumacinta River drainage in Tabasco, Mexico, have led to a wealth of new and surprising data that is changing our understanding of when and how people who lived in the tropical lowlands during the Early and Middle Preclassic became what we call the ancient Maya.

**Trimble, Michael (US Army Corps of Engineers)**

[81]

*Discussant*

Trimmis, Konstantinos [67] see Kardulias, P. Nick

Trinh, Hiep [26] see Muir, Brianna

**Trinidad-Rivera, Gelenia (New York University)**

[44]

*“Apprehend the Flawed!”: Social Disability in the Advertisements of the Newspaper La Gaceta del Gobierno de Puerto Rico, 1831–1833*

Slavery in Puerto Rico had its various levels of abundance and scarcity during the nineteenth century. With the establishment of open trade regulations and the continuous efforts of Spain to retain its imperialist status, chained enslaved African and “mulato” populations on the island were kept as the fuel for the wealthy. If it was difficult for those who were enslaved to survive during this period, those who had visual “defects” that stayed away from the norm of the time, suffered the worst consequences. The following study focuses on analyzing, under the lens of social disability, the populations of enslaved individuals who presented corporal indicators of their social status such as wounds, amputations, tattoos, scars, and scarifications, among others. The historical rescue presented in the following investigation is carried out by consulting advertisements and announcements from the newspaper *La Gaceta del Gobierno de Puerto Rico*, during 1831–1833, related to the sale and marketing of fugitives and captured enslaved

individuals. From the data retrieved, the aspects related to race, sex, and age are correlated. Thus, illuminating inside the darkness where these populations are constantly nudged: the periphery of history's official narrative.

Triozi, Nicholas [122] see McClure, Sarah

**Tripcevich, Nicholas (UC Berkeley), José Capriles (Penn State University) and Calogero Santoro (University of Tarapacá, Chile) and Nicholas Tripcevich**

[10]

*Bright Stones and Montane Foragers: A Review of Archaic Mobility through the Light of Obsidian Provenience Studies*

Mark Aldenderfer's pioneering study of the Archaic period of the south-central Andes emphasized the importance of interdisciplinary research and archaeometric research for reconstructing ancient foraging behavior. Because obsidian is not only an excellent raw material but it is quite homogenous compositionally, geochemical analysis can facilitate geographic sources. In this paper, we pick up from Aldenderfer's work on Asana and review recent including unpublished research about obsidian distribution in the region between southern Peru, western Bolivia and northern Chile. Results suggest the existence of various sources, some of them of relatively low quality, as well as the changing importance and scale of mobility cycles across time.

Tripcevich, Nicholas [10] see Tripcevich, Nicholas

**Triplett, Taylor (College of William and Mary)**

[109]

*Theorizing Absence, Locating Liminality: Evidence for Multistage Burial Features in the Late Woodland Middle Atlantic*

This paper explores the complexity of "mortuary contexts" as an archaeological category by examining a particularly ambiguous class of feature: temporary or emptied graves. Though often mistaken for refuse or storage pits, temporary graves were critical to the creation of ossuaries in eastern Native American societies. Ossuaries are communal interments of bundled human remains that can contain hundreds of individuals. Ethnohistoric accounts suggest that ossuaries were created through a multistage process by which the deceased are appropriately prepared for interment and transformed into ancestors. Evidence attesting the earliest stages of this burial process, such as temporary graves or charnel houses, are rarely identified archaeologically. How do we locate and theorize a feature whose hallmark trait is absence? This paper evaluates evidence from the Late Woodland (AD 900–1600) Middle Atlantic region, particularly from the Hand site (44SN22) in southeastern Virginia, in order to identify the morphological and artifactual signifiers of temporary graves. Further, this paper argues that a close attention to ambiguous deposits offers a rare glimpse into moments of liminality in the deep past, while inviting us to critically examine the depositional categories archaeologists so often rely on.

**Tritsch, Michael (Yale University)**

[225]

*A Domestic Horizon: Household Niches and Private Religious Practices in New Kingdom Egypt*

This paper focuses on the analysis of niche emplacements in New Kingdom domestic contexts, with a goal of shedding new light on their significance and function within the sphere of private religious practices. Appearing throughout Egyptian settlements, niches share significant similarities in design, with their function having been linked to a need to achieve architectural balance and to serve as a location for cultic acts. To investigate this topic further, an in-depth examination of previous research and archaeological data together with relevant ritual texts has facilitated a reconstruction of their role in ritual performance. From an archaeological perspective, the location of niches in houses seems to correlate with the configuration of "reception rooms," although this does not reflect their function. Their function within domestic structures emerges when viewed from a religious perspective, which reveals that these emplacements formed a locus for ancestor worship, while also exhibiting the lineage of the household, serving as a mode of conspicuous consumption. Through a stylistic and philological evaluation, the evidence indicates that the niche design mimics the akhet-horizon, allowing for the deceased to enter the hereafter and acting as a location for regular offerings, attesting to the significance of private religion in daily life.

Tropper, Peter [132] see Zori, Colleen

**Troutman, Michele (Binghamton University)**

[4]

*Retracing Communities in the Northeastern Early Archaic: A Lithic Analysis Comparison of the Johnsen #3 and Haviland Sites*

Archaeologists typically use projectile point typologies as chronological markers to define communities and their associated cultural changes through time. The Northeastern Early Archaic centers its typology on the chronological sequence of sites found in the Southeast. However, several researchers observed temporal overlap between several projectile point styles, such as Funk's research at Russ, Gardepe, and Johnsen #3. Similarly, the radiocarbon dates (8585 ± 190 BP to 9140 ± 260 BP) at the Johnsen #3 (Kirk horizon) site overlap with the radiocarbon date (8405 ± 65 BP) at the Haviland (bifurcate-base horizon) site. This overlap raises the question of whether such projectile point styles are accurate indications of widespread technology changes over time, or whether they are more representative of regional communities and associated technological traditions. One method of testing this theory is through a detailed analysis of the lithic technological production process and whether similar reduction techniques are shared to create "different" projectile points. Samples are drawn from the Johnsen #3 and Haviland sites for comparisons and I consider how those sites are situated with other contemporary Early Archaic communities.

Trujillo Hassan, Daniela [193] see Wesp, Julie

**Tsai, Howard (University of Michigan)**

[84]

*Rethinking the Concept of "Intermediate Area," with Examples from the Andes*

Archaeologists have conceptualized the intermediate area (IA) as a region sandwiched between spheres of higher sociopolitical complexity. Lacking monumental centers and located far from modern cities, many IAs represent a lacuna of archaeological investigation. In this paper I caution against analyzing the IA as just that: a less glamorous sibling of greater and more grandiose cultures. We should question and not assume that IA communities conceived themselves as subalterns in prehistory, since historical and ethnographic cases often reveal the primacy of local actors in shaping local politics. The advantage of studying IA, on the other hand, lies in the possibility of constructing precise local chronology based on non-isomorphic yet overlapping cultural periods from adjacent, better-documented regions. I present findings from the site of Las Varas, located in the Middle Jequetepeque Valley of northern Peru, to illustrate my argument.

**Tsesmeli, Evangelia (NM State Land Office), David Eck (NM State Land Office) and Anne Curry**

[66]

*Challenges in Protecting Cultural Resources: Policy and Rulemaking from a New Mexico Perspective*

Policies, rules, and laws for the protection of cultural resources are in place at the federal and state level. This research discusses the challenges in instituting a workable cultural resource protection rule on New Mexico State Trust Lands and the processes that must balance a variety of cases and needs among a diverse body of decision-makers, stakeholders and practitioners. It also presents a culture history of competing interests of historic preservation, commercially feasible outcomes, and the effects of political complexity in policy and rulemaking.

**Tsukamoto, Kenichiro (University of California, Riverside)**

[13]

*Internal Distinction and External Affiliation: Practices and Interactions of Maya Standard-Bearers in the El Palmar Dynasty, Mexico*

Weber's notion of legitimacy obscures the significance of practices and interactions among other social members in governance structures. The study of ancient Maya society is the case. While hieroglyphic texts indicate the emergence of officials who were deeply engaged in politics during the Late Classic period (600–800 CE), little is known of their socio-material relations in regard to authority, domination, and legitimacy. Above all, those who lived in city's outlying areas must have been closely involved in the process of social distinction, bureaucratization, and urbanization. This paper focuses on diplomatic officials, standard-bearers, who negotiated alliances among Maya dynasties. In the El Palmar dynasty they lived in the city's north outlying area where their practices and perceptions constantly changed along with the transformation of spatial settings over time.

**Tsukamoto, Kenichiro (University of California, Riverside)**

[13]

*Chair*

Tsukamoto, Kenichiro [188] see López Camacho, Javier

Tsukamoto, Kenichiro [13] see Murakami, Tatsuya

Tsukamoto, Kenichiro [104] see Stephens, Katharine

Tsukamoto, Kenichiro [95] see Sullivan, Kelsey

Tsukamoto, Kenichiro [110] see Wedemeyer, Rachael

**Tsurumi, Eisei (University of Tokyo), Jason Nesbitt (Tulane University) and Yuichi Matsumoto (Yamagata University)**

[129]

*Reappraising the Chronology of the Initial Period (ca. 1700–800 BC) in the Central Andes*

The Initial period (1700–800 BC) was a time of major cultural transformation in ancient Peru. Changes during this time include the introduction of pottery, a significant expansion of monumental and public architecture, and more intensive agricultural systems. However, over the last few decades archaeological research has generated an increasing number of radiocarbon dates from Initial period sites on the Peruvian coast, central highlands, and Ceja de Selva. In this presentation, we collate these radiocarbon dates in order to reconsider some of the cultural processes that occurred during the second millennium BC.

Tumurbaatar, Tuvshinjargal [139] see Morgan, Christopher

**Tung, Tiffany (Vanderbilt University), Steven Wernke (Vanderbilt University), Beth Conklin (Vanderbilt University) and Tom Dillehay (Vanderbilt University)**

[87]

*Ebullience and Empire: Reflections on Performative Statemaking in the Work of John Janusek*

John Janusek challenged prevailing top-down, center-out, conflictual, and environmental prime mover models of the emergence of hierarchical, centralized social formations in the Andean past. Instead, performativity and the generative effects of collective ritual were central to his thinking and contributions to our understanding of Andean complex societies. Rooted in his deep engagement and experiences with host communities in the altiplano, Janusek emphasized the power of participatory ritual as a key motor force in the emergence of a peri-centric landscape of growing formative centers in the region. He saw such processes as a core motor force

in the expansive influence of Tiwanaku, and later in the Inka Empire. In this model of ebullient politymaking, we gained glimpses of radically different ways of conceiving and organizing urban space and the polities that produced (and were produced by) them compared to other world regions. The ebullience central to his theoretical and substantive contributions were reflected in his practice as an archaeologist. Throughout his work, John Janusek embraced a capacious approach to anthropology that equally accommodated social scientific and humanistic modes of inquiry—a quality that deeply influenced generations of students and colleagues.

**Tung, Tiffany (Vanderbilt University)**

[157]

*Discussant*

Tung, Tiffany [193] see Velasco, Matthew

Tung, Tiffany [82] see Whitemore, Anna

**Turgeman-Yaffe, Zohar (Zinman Institute of Archaeology, University of Haifa)**

[191]

*The Organization of the Hunt in the Middle Pleistocene Levant: Unit V in Neshar Ramla, Israel*

Most of our knowledge regarding human hunting in the Middle Paleolithic period of the Levant derives from “residential” cave and rockshelter sites, while the behavior in open-air sites is less well-known. The study of open-air sites allows for better understanding of the *chaîne opératoire* of hunting, as it potentially is closer in time and space to the hunt itself. The open-air site of Neshar Ramla provides an exceptional opportunity for the study of Middle Paleolithic hunting organization in the Levant. Unit V, the richest, most intense unit in the site, is part of the lower sequence and is a relatively thin horizon that included combustion features, manuports, large quantities of flint artifacts, and a high density of well-preserved animal bones. Differences between the center and margins of the sinkhole suggest distinct activity or discard areas. The faunal assemblage is dominated by large ungulates, (e.g., *Bos primigenius*) and tortoises, and features high frequency of human modifications such as butchery and percussion marks. Using taphonomic, spatial, and demographic data as well as intra- and inter-site comparisons, we examine whether Unit V represents opportunistic or selective hunting of individual animals, or large-scale mass hunting and consequential processing of aurochs.

**Turley, Cameron (Graduate Center, CUNY)**

[130]

*“The Store Is the Seal Now”: Labor and Trade in Nineteenth- to Twentieth-Century Alluitsoq Fjord, South Greenland*

Danish and Moravian colonization and missionization from the eighteenth century onward heralded expansive changes for Kalaallit society. In this paper, we think through stories of Kalaallit survivance as it pertains to one of these major changes: participation in the typically unequal colonial market economy. Our spatial focus is on Alluitsoq, the former Lichtenau Moravian mission (est. 1774), and its surrounding region. Three complementary datasets narrate how participation in global markets via the Danish-Greenlandic Trade developed from the mid-nineteenth to twentieth centuries in South Greenland. These include archaeological data consisting of both durable items purchased from the nearby trade station in Alluitsup Paa (Sydprøven) and faunal remains of hunting and fishing activities in the region. These data are complemented by primary documents which record wages and stipends, goods sold to the trade stations, and shop inventory records. Finally, ethnographic interviews with descendant elders from Alluitsoq create the critical narrative framework to contemplate the local-level effects of these processes. These social and material memories tell one story—one of a great many—of people navigating unequal colonial worlds in a process of becoming into the present day and the future.

**Turley, Cameron (Graduate Center, CUNY)**

[130]

*Chair*

Turley, Cameron [33] see McGovern, Thomas

**Turner, Andrew (Getty Research Institute)**

[128]

*Pulque and Supernatural Felines in Ancient Mesoamerican Art and Symbolism*

An important aspect of Karl Taube's work has been the identification of fundamental religious beliefs and symbolic complexes shared among different Mesoamerican cultural traditions. His uncanny ability to recognize and understand processes of cultural translation opens windows into patterns of cross-cultural interaction and intellectual exchange that have otherwise gone unnoticed due to differing modes of artistic representation. One particular aspect of Taube's work that has challenged scholars' underlying assumptions and shifted the course of Mesoamerican studies, which he has revisited throughout his career, has been his methodical study of cross-cultural interaction between Teotihuacan and the Classic Maya, and especially the profound impact that the former culture had on the latter. This study celebrates this aspect of Taube's intellectual legacy by exploring symbolism regarding the consumption and production of pulque, a fermented drink made from agave, and its relationship to rain deities and supernatural felines in the art of Teotihuacan and the Classic Maya.

**Turner, Andrew (Getty Research Institute)**

[156]

*Discussant*

**Turner, Bethany (Georgia State University)****[157]***Migrations and Transformations in the Inka Imperial Heartland*

The Inka Empire rose meteorically to power in the fourteenth-fifteenth centuries, expanding out of the southeastern Peruvian highlands to dominate much of the Central Andes. Inka statecraft was based in part on the relocation of imperial subjects, both locally and across far-flung regions, through co-opting the ancient mit'a tributary labor system. The Inka both transferred physical bodies from one location to another and redefined those bodies' productive potential to serve imperial ends. By reconstructing the residential origins of human remains from different Inka sites, especially those in the city of Cusco and the Sacred Valley that formed the imperial heartland, we can better frame Inka statecraft from the ground up, using individuals' physical relocations (or lack thereof) as entry points to better understand their varied articulation with imperial systems. This study presents new  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $^{206,7,8}\text{Pb}/^{204}\text{Pb}$  ratios from individuals interred at the heartland sites of Salapunqu ( $N = 39$ ) and Saqsaywaman ( $N = 74$ ) and compares them to published values from Machu Picchu ( $N = 40$ ) and Patallaqta ( $N = 81$ ). Each site served a different function in the empire, and isotope results indicate marked variation in residential origin and community structure, providing further insight into the nuanced relationships between mobility and status within the imperial core.

**Turner, Bethany (Georgia State University)****[193]***Discussant*

Turner, Jeremy [196] see Everhart, Timothy

**Turner, Michelle (Mystic Seaport Museum)****[152]***The Wallace Great House Assemblage: New Research at the Edges*

Recent research on Chaco outliers has painted a picture of diverse choices and diverging histories, blurring the notion of a single Chaco Phenomenon pattern or experience. Chaco outliers have sometimes been defined as such primarily based on architectural features, but many distant great houses do not fit the picture perfectly, and artifact analysis is often overlooked in considering outliers. The Wallace Great House site in southwest Colorado, long recognized as a Chaco outlier, does not fit the bill in some ways that other great houses do, but its architecture and artifacts nonetheless point to a site closely attuned and connected to the Chacoan world. Drawing on major new research on the artifact assemblage from this site, part of the Northern Chaco Outliers Project, I will consider how people at one community far from Chaco Canyon might have experienced Chaco's expanding influence. My paper will also consider the question of the role of objects, particularly of special objects that have travelled long distances, in our understanding of outlier relationships to the Chacoan world.

Turner, Simon [50] see Graham, Elizabeth

Turner-Livermore, Bethany [38] see Cobb, Emilie

**Turney, Kathryn (Yavapai County Public Works), Deborah Huntley (Tetra Tech Inc.) and Johnny Schaefer (Tetra Tech Inc.)****[66]***Rescuing the Past: An Unexpected Wealth of Data from the Yavapai County Correctional Facility Project*

In the spring of 2021, archaeologists were called to the site of the new Yavapai County Correctional Facility to investigate an archaeological deposit that had been uncovered by a backhoe operator. Despite the highly disturbed nature of the site, it produced a body of useful information about the poorly understood local Prescott Culture. Analysis of recovered ceramics, chipped stone, clay figurines, and other artifacts, as well as subsequent XRF and macrobotanical analyses, provided a surprisingly rich interpretation of the site that was unexpected for a "salvage" project.

**Tushingham, Shannon (Washington State University), Brian Byrd (Far Western Anthropological Group), Jelmer Eerkens (UC Davis), Monica Arellano (Muwekma Ohlone Tribe) and Alan Leventhal (Muwekma Ohlone Tribe)****[18]***Gender and Ritual Plant Use: Collaborative Research Reveals Women's Tobacco Use and Expertise in Ancient California*

Residue analysis of precontact pipes and dental calculus has significantly advanced our understanding of psychoactive plant use in western North America. This includes confirmation that tobacco and other smoke plants have a long history of use by hunting, gathering, and fishing communities. In this paper, we synthesize recent collaborative research with Tribal communities in the California Bay Area designed to better understand the age and gender dynamics of tobacco use. Dental calculus studies revealed an unexpected result: far more women were apparently tobacco users than men. We discuss this finding, along with findings relating to gender and age differences in tobacco chewing vs. smoking. We suggest that women's tobacco use (and expertise) may have been obscured through colonial forces and ethnographic sources. Because ethnohistoric data suggest that tobacco users at contact were largely male, these findings have important implications for evaluating assumptions about gender and ritual plant use in the past.

Tushingham, Shannon [18] see Zimmermann, Mario

**Tveskov, Mark (Southern Oregon University), Courtney Krossman (Confederated Tribes of Coos, Lower Umpqua, and Siuslaw), David Maki (Archaeophysics LLC) and Stacy Scott (Confederated Tribes of Coos, Lower Umpqua, and Siuslaw)**  
[131]

*The Haynes Inlet Shell Midden and Fish Weirs: Engaging a Hanis Coos Cultural Landscape in Southern Oregon through Archaeology*

The Haynes Inlet shell midden and fish weir cultural landscape is constituted by shell middens, wood stake fish weirs, oral histories, written documentation, and threat of destruction via a natural gas pipeline and climate change. The meanings and significance of the landscape has been constructed iteratively through the practice of being, knowing, and relationship building among Coos people, settlers, and archaeologists through millennia to the present day. This paper describes recent engagement with the site by the property owner, the Confederated Tribes of Coos, Lower Umpqua, and Siuslaw, and archaeologists and how this landscape speaks to the identities, relationships, and agendas of each.

**Tveskov, Mark (Southern Oregon Univ)**

[131]

*Chair*

Twiss, Katheryn [158] see Iorga, Anastasia

Twiss, Katheryn [158] see Jaramillo, Sara

**Tykot, Robert (U. of South Florida)**

[53]

*A History of Stable Isotope Studies in Italy*

In Italy, stable isotope analysis of skeletal remains to study diet began in the late 1980s. Research has expanded since then to include carbon, nitrogen, oxygen, and strontium analyses of different body tissues (collagen, apatite, tooth roots and enamel) in reconstructing human lifeways; addressing research questions on the importance of seafood in the overall diet; the proportions of meat, milk and cheese from domesticated cows and sheep; geographic origins if nonlocal; potential differences between individuals based on sex and/or status; and changes over time from the Mesolithic thru Medieval periods. Recent studies illustrate the importance of having sufficient local and contemporary isotope values for plants and animals, since there may be significant differences in the baseline values of the food being consumed due to natural/geographic variability and/or human involvement in agricultural fields and animal foddering. In addition, it is critical for comparison of data from different research projects to using similar sample preparation methods and dietary calculation scales for apatite/enamel samples. Overall, the number of sites and individuals tested is limited by chronology (especially pre-Neolithic, Bronze Age, and pre-Roman Iron Age), and geographic areas, so there is still a need for continuing research on dietary variation over time and space.

Tzortzopoulou-Gregory, Lita [67] see Kardulias, P. Nick

Ueki, Allyson [175] see Arakawa, Fumi

**Ullah, Isaac (San Diego State University)**

[206]

*Virtual Sampling Simulation Experiments for Training and Planning for Field-Collection of Microrefuse Samples*

The concept of sampling is well entrenched in archaeology, and yet, many misconceptions about sampling still remain in the discipline. Proper field sampling is essential to assure the quality of the results of any kind of statistical analysis of artifact assemblages, and is particularly important for microrefuse analysis because the small size and variable quantities of these artifacts may amplify sampling biases when typical sampling methods (e.g., grid-based, point, or bulk sampling) are employed. I present a simple, graphical, free and open-source, web-based simulation approach for conducting sampling experiments that can help archaeologists prepare for field sampling of microrefuse or other archaeological materials. The simulation approach allows experimentation with numerous sampling strategies and potential artifact distributions. Different sampling scenarios can be numerically and visually tested and compared, and the tool can be used in educational contexts, in preparation prior to fieldwork, or even employed on site while in the field—perhaps in response to new data. The goal is to provide a tool to help archaeologists build confidence in their sampling decisions, to understand the ramifications of sampling choices, to help them decide when and how to change sampling strategies, and ultimately to create better datasets.

Ullman, Micka [85] see Lazagabaster, Ignacio

Ur, Jason [183] see Creamer, Petra

**Urban, Patricia (Kenyon College)**

[188]

*Living (in) the Past*

Throughout our 40+ years of friendship, Wendy and I often turned to a very basic question: how was it really to live in past times, given that the past is not just gone, but as many have said, is a foreign country. In this paper I hope to bring ideas from

phenomenology to how I, at least, and Wendy (in our conversations) tried to get a visceral feeling for lives lived in the sites where we worked. The focus is not on elites, but on those who lived in the small structures, crafted goods, farmed, and were most likely at the lower end of sociopolitical organization(s).

**Urban, Thomas (Cornell University), Matthew Bennett (Bournemouth University), David Bustos (National Park Service) and Daniel Odess (National Park Service)**

[184]

*Geophysical Approaches to Pleistocene Footprints at White Sands National Park, New Mexico*

Pleistocene footprints at White Sands have been detected and imaged using several geophysical approaches, greatly expanding our capacity to study these remarkable finds. Successful cases have ranged in size from adult mammoths to small human children. Magnetometry and ground-penetrating radar have been used in several configurations, with protocols implemented to protect the prints from damage during data collection. We review what we have tried, how our approaches have evolved, and consider the impact of these methods on the broader work at White Sands.

Urban, Thomas [184] see Bennett, Matthew

Urban, Thomas [184] see Bustos, David

Urban, Thomas [184] see Odess, Daniel

**Uribe, Mauricio, Camila Riera-Soto (University of Cape Town), Javiera Gajardo (University College of London) and Petrus Le Roux (University of Cape Town)**

[200]

*Ingredients for Andean Pottery Traditions: Petrography and Geochemistry of the Ceramics Paste in Iluga Túmulos (Tarapacá, Northern Chile)*

Ceramic pastes are not only composed by the perfect mixture of minerals, water, and fire but also contain cultural experience, and are immersed in a geological environment, vertical landscape, and exchange networks that identify the Andean pottery traditions. These cultural and environmental aspects can be approached through ceramic petrography and bulk chemical analysis, allowing the archaeological interpretation of raw materials. The Iluga Túmulos site (100 BC–1600 AD) is a relevant archaeological area of northern Chile, with abandoned agricultural field crops and public monuments partially buried by aridization processes. Ceramics are certainly the most abundant material with evidence from the Early and Late Formative, the Western Valleys and Altiplano of Late Intermediate period, Imperial, Provincial and Local Inca styles, and Hispanic pieces. We present an update of our study on the ceramic record of Iluga Túmulos site, with the objective of to combine the results obtained by ceramic petrography (thin sections and automated mineralogy) and geochemistry (major, minor, and trace elements, and radiogenic isotopes) together with the regional archaeo-ethnographic data, in order to reconstruct the management of knowledge, landscapes, raw materials sources, and circulation of vessels that represent the multiple pottery experiences of different populations of the Central-South Andes.

**Uribe, Mauricio**

[200]

*Chair*

Uribe, Mauricio [29] see Santana Sagredo, Francisca

Uribe, Mauricio [74] see Vidal-Elgueta, Alejandra

**Utting, Benjamin**

[181]

*Exploring Prehistoric Technology at the Trang An Landscape Complex*

Paleolithic stone tool assemblages throughout Southeast Asia are characterized by simple stone tools. Past approaches toward identifying technological variability in these assemblages have tended to rely on cultural typological methods, which are poorly suited for assemblages that comprise tools that are rarely curated and that exhibit limited evidence of a formal template. More recent approaches that include attribute analysis and behavioral ecological modeling are proving more adept at identifying and interpreting variability in these assemblages and placing tool use into its environmental context. This presentation addresses the interaction between lithic technology and environmental change at a cluster of Terminal Pleistocene/Early Holocene cave sites in Ninh Binh Province, Vietnam. It synthesizes lithic analysis, raw material studies, and behavioral ecology to deliver new insights into prehistoric tropical hunter-gatherer land use in Southeast Asia.

**Uzzle, Stephen (Statistical Research Inc.)**

[175]

*Mobility as a Land Use Strategy in Prehispanic Southwest New Mexico*

Fourteenth-century Cliff phase Salado (AD 1300–1450) villages in southwest New Mexico show interesting contrasts in architecture, burial patterns, artifact accumulation, and other indicators of more frequent mobility in comparison with earlier villages in the same region from the Classic Mimbres period (AD 1000–1130). Despite heavy reliance on maize agriculture in both time periods, Salado period villagers likely employed a land-use strategy relying on more frequent mobility between villages and at larger spatial scales in comparison to Classic Mimbres period residents of the same areas. This study assesses evidence for changes in mobility in the Classic Mimbres and Salado periods using datasets from numerous excavations in the Mimbres region (Upper Gila and Mimbres Valleys) and examines the implications of different mobility patterns for prehispanic land use strategies. This research builds on an earlier study that used two datasets, presence or absence of burials and post-hole density, as evidence in favor of short-term sedentism. This study adds floor-slope data as a complementary line of evidence to compare time periods.

**Vacca, Kirsten (University of Hawai'i–West O'ahu)****[190]***Community-based Participatory Research in the Era of COVID-19*

Field schools are common components of university anthropology programs, and community-based participatory research (CBPR) is an important approach that many of these projects incorporate. However, the past two summer field seasons were impacted by the global COVID-19 pandemic that made gathering in large groups with often vulnerable community members dangerous. To meet the educational needs of students and cultural preservation needs of communities, programs needed to adjust. A preliminary UHWO field school was held in the summer of 2021 at the local Kalaeloa Heritage Park in Kapolei, O'ahu, that aligned with the needs of this community park and adjusted for COVID-19 safety protocols. The paper will discuss how the field school adapted to distance education and community collaboration through on-site and remote contributions to the community park. These contributions aligned with the current needs of the park in these unique circumstances and will benefit future visitors outside of pandemic protocols.

Val, Aurore [155] see Hodgskiss, Tammy

**Valadez, Moises (INAH Mexico)****[26]***The Hidden Death: Prehistoric Burials of Northeastern Mexico*

In the archaeology and historical references of northeastern Mexico, mortuary practices are rarely mentioned, probably because the Indigenous people of the past had significant mortuary rituals and a particular choice of places to bury their dead. Unlike the farming peoples, the hunter-gatherers of the Northeast carefully chose the burial sites of their dead, on the one hand due to their symbolic beliefs to avoid the misuse of the bodies by enemy groups, and on the other hand to preserve life by hiding death. Throughout the presentation we will describe the places, practices, and prehistoric burial patterns in this region, with a chronological range of 6,000–2,000 years.

**Valante, Mary (Appalachian State University)****[42]***"Sending Round the Drinking Horns": Drink, Social Obligation, and Identity in Viking-Age Ireland*

Feasting was a social obligation for the leaders of Viking-Age towns in Ireland like Dublin, one rooted in their identity as "foreigners" in Ireland. Siobhan Geraghty's foundational work on botanical evidence from Dublin points to the ways grain production in Ireland adapted to supply the demands of the towns, including ale-making. Artifacts such as drinking horn finials provide evidence for drinking and feasting, while texts such as the Book of Rights describe the trade in raw materials such as grain, malt, and honey from Dublin's hinterland. Feasting created and maintained social and economic ties between Dublin and its surrounds, while at the same time reflecting the Scandinavian ancestry of its rulers, reinforcing the identity that legitimized their reign.

Valdés, Alejandro [174] see Castañón-Suárez, Mijaely

Valdez, Fred, Jr. [83] see Hyde, David

Valdez, Fred, Jr. [209] see Locker, Angelina

**Valedon-Trapote, Andrea (University of Michigan)****[99]***Rethinking the Yuan "Chinese" Palace City: Building Ordo Spatial Logic into the Mongol Great Capital*

Current scholarship describes the layout and architecture of the Yuan dynasty's (1279–1368) capital Dadu (contemporary Beijing) as a "Chinese" city. However, archaeological remains and textual descriptions of the "Great Capital" Dadu indicate that in comparison to previous and contemporaneous capitals constructed above and below the Great Wall, Khubilai Khan (r. 1260–1294) built a specifically Mongol gendered logic of tent cities (ordo) into the Yuan palatial complex. Moreover, the layout of Dadu aligned more closely with the spatial logic of cities in Mongolia and northeastern Asia than with urban traditions of "Chinese" capitals, to which Dadu is often compared. I assert that in order to understand the logic of Dadu, we must look more toward the urban spaces and places that Mongols had been building and engaging with in the steppe.

Vallejo-Pareja, Maria Camila [85] see Rubinatto Serrano, Juliana

**Vallejos, Joshua (University of New Mexico / Statistical Research Inc.)****[100]***Discussant*

Valletta, Francesco [191] see Centi, Laura

**Van Alst, Emily (Indiana University)****[101]***Heháka pñežúta: A Multidisciplinary Approach to Elk Imagery and Traditional Plants*

Lakota women have long had an important relationship with the plants of their traditional homelands on the Northwest Plains of the United States. Their roles include the maintenance and sustainability of the local flora through traditional harvesting methods as well as the transference of knowledge related to different species to younger generations. Archaeologists working in the region have previously noted potentially associated plant remains with rock art sites but the exact nature of their use and purpose have not been fully explored. In this paper I take a multidisciplinary approach to further examine the potential relationships between Lakota women and local ecology at rock art sites, specifically focusing on elk imagery from Montana, South Dakota, and Wyoming. Drawing from the fields of archaeology, botany, and Indigenous geographies I ask how Lakota women experience(d) palimpsest landscapes of natural and cultural features.

**Van Broekhoven, Laura (Pitt Rivers Museum, University of Oxford)****[1]***Discussant***Van Buren, Mary (Colorado State University)****[88]***Discussant*

Van Cleve, Andrew [207] see Poister, Nicholas

**Van Der Reijden, A. Jay (University of the Highlands and Islands)****[61]***Passage into the Afterlife: Accessing the Netherworld through Maeshowe's Internal Walling*

Maeshowe, the UNESCO-listed Neolithic passage grave in Orkney Scotland, is renowned for its awe-inspiring, dry-stone, vast main chamber complimented by three minuscule apertured side chambers. Yet its building archaeology, the deployment of the stones themselves, has been left aside. To investigate this—and generate a nuanced dataset—the *chaîne opératoire* and microhistory methodologies were conjoined. This afforded multiple novel and multiscalar intentional construction behaviors to be documented within the internal walling. I address, here, inversions of distinct design and stone treatments displayed between the main and side chambers; concerning for the latter, verticality—down for up, and handedness—left for right. As an example of orientation, fluvial stratigraphic rocks are geologically inverted; for handedness, the left-side masonry is superior—against the grain of the Neolithic Orkney right-hand norm, e.g., Skara Brae, Ness of Brodgar, etc. Furthermore and uniquely, the specific left-dominant feature of corner cutouts, also novel to this study, is exclusively associated with incising, a first. These features of reorientation, watery inversion, and left-for-right, suggest an interpretation that side chambers, specifically and oppositionally, exist within an inverted world. Therefore I propose the side-chamber apertures gesture a physical opening into an upside-down Land of the Dead where the main chamber's walling is the barrier betwixt.

**Van Dyke, Ruth (Binghamton University)****[152]***Discussant***Van Keuren, Scott (University of Vermont)****[173]***Adobe Bricks and the Migrant Experience at Fourmile Ruin, Arizona*

Adobe brick construction is an important marker of migrant pathways in the northern Southwest during the fourteenth century (AD). At Fourmile Ruin, a large Ancestral Pueblo village in the Upper Little Colorado River drainage, this building technique was used extensively in a region dominated by masonry construction. Village growth was complex. In some areas, adobe bricks were used to construct new (ladder-type) room blocks; elsewhere, adobe brick and masonry were mixed in walls added to existing masonry room blocks. These activities expanded residential space but also delineated new and expansive plazas. Extensive bond and abut sequences were visible at the site prior to acquisition by the Archaeological Conservancy. In this poster, I examine room construction and village growth using these sequences and earlier data collected by Doug Johnson. Migration studies in contemporary Southwest archaeology often focus on big patterns using social network analyses and other interregional data. The smaller-scale settlement histories of villages like Fourmile Ruin are equally important for understanding the migrant experience during this transformative period.

**Van Meter, Nicole (University of Miami), William Pestle (University of Miami), Daniel Koski-Karell (National Institute of Archaeology, Washington DC) and Megan Carden (Columbia University)****[19]***The Caribbean's First Known Fossil Pendants: Objects of Adornment and Place-Making among the Earliest Inhabitants of Southwestern Puerto Rico*

Objects of bodily adornment communicate information about identity, symbolic systems, social structure/roles, and notions of personhood. In Puerto Rico, objects of adornment dating to pre-Arawak times are rare, resulting in contingent understandings of

their uses/meaning. This work, which comprises of archaeological, morphological, and elemental analysis of an assemblage of heretofore unpublished pendants discovered in mortuary contexts at the Ortiz site in Cabo Rojo, southwestern Puerto Rico, sheds light on how and why pendants may have been used during the island's earliest occupation. As all five human burials from the Ortiz site included at least one pendant, it appears that, for almost 1,000 years (ca. 1900–800 cal BC), pre-Arawak people returned to this site to bury their dead adorned in this prescribed manner. Twenty-one of the pendants and fragments were made of phosphatic fossil material, the first and only known use of this material for these purposes in the insular Caribbean. Possible explanations for the selection of material, and the connection with the concept of place-making at the Ortiz site are explored, as we examine what the pendants may have expressed to others throughout the island and the circum-Caribbean.

Van Oss, Sarah [188] see Canuto, Marcello

**Vance, Ashley (University of Illinois at Chicago)**

[92]

*Living, Nonliving, and Once Alive: The Biology of Spondylids of the Eastern Pacific Ocean*

The story of *Spondylus* does not begin in an artifact cache or human burial. Long before *Spondylus* shells ever became modified ornaments and commodities in the ancient Andes, they housed living organisms beneath the rolling waves of the Eastern Pacific. This presentation reanimates the physiology, behavior, and distribution of certain Eastern Pacific *Spondylus* species, which directly influenced human foraging strategies in the past. Additionally, this work reexamines the unique taxonomy of the shell family Spondylidae and ongoing debates concerning species name changes and shellfish identification practices.

**VanderVeen, James (IU South Bend) and Calvin Petrucelli (IU South Bend)**

[159]

*Engaging in Coursework and in Communities: Field School Students as Active Citizens*

Archaeological field schools are a form of apprenticeship, providing students with the skills needed to become professionals in the discipline. But there is an added and unexpected value to the experience: Field school students are engaged and informed citizens. They report higher rates of civic engagement and often take political action on issues important, when compared to students who eschew field school. They also show a higher disposition toward matters that have implications for a fair and just society. In this small study, with limited participants, the results are in line with larger, longitudinal studies of civic learning in higher education. The power of an archaeological field school is more than an investigation into the past, with training of specific excavation and analytical skills. It promotes positive links to the development or increase of commitments to social and political concerns.

VanDerwarker, Amber [15] see Johnson, Emily

VanDerwarker, Amber [8] see Noe, Sarah

**VanPool, Christine and Todd VanPool (University of Missouri)**

[89]

*Animal Transcosmological Traveling in the Casas Grandes World*

One of the hallmarks of altered states of consciousness (ASC) produced by entheogens is seeing spirals and the feeling that one is spinning through a vortex to travel to another realm—perhaps deep into the earth or far out into the cosmos. Lewis-Williams and Pearce (2005) call this spinning “transcosmological travel” and provide firsthand ethnographic accounts of it. ASC also commonly includes the feeling of partly or fully transforming into another animal. Previously we have discussed Casas Grandes shamanic journeys based on tobacco using male smoker effigy jars and female effigy jars, but here we focus on Casas Grandes bird and snake effigies. We suggest these vessels reflect transcosmological travel in features such as the spiraling snake and bird effigy jars. We explore the cosmological significance of both transcosmological travel and its association with macaws and snakes, which served as axis mundi (gateway) animals in Casas Grandes cosmology.

VanPool, Christine [89] see VanPool, Todd

**VanPool, Todd (University of Missouri), Christine VanPool (University of Missouri), Laura Lee (Cuyamungue Institute) and Paul Robear (Cuyamungue Institute)**

[89]

*Trance with and without Entheogens*

Altered states of consciousness (ASC) take many forms, ranging in intensity from daydream-like experiences to catatonic states. Trance, often initiated using entheogens, is a particularly common form of ASC found through time and around the world. While entheogens are commonly used, trance states can be initiated without their use, and even when they are used, entheogens are generally only a part of the trance experience. As a result, trance experiences, especially in religious contexts such as shamanism, cannot be reduced to the impact of entheogens, but instead reflect the influence of the social setting, other ritual paraphernalia such as noisemakers, the individual's own physiological state, and culturally derived expectations of the experience. Here we compare the nature of trance-states produced with and without entheogens focusing on ritual body postures and the use of sound induction (sonic driving) as discussed by Felicitas Goodman and Michael Harner. We tie ritual body postures to specific archaeological cultures and evaluate the potential impacts of entheogens and other ritual activities in the North American Southwest, West Mexico, and Mississippi culture areas.

VanPool, Todd [89] see VanPool, Christine

**VanValkenburgh, Parker (Brown University), Steven Wernke (Vanderbilt University), Sofia Chacaltana-Cortez (Universidad Ruiz de Montoya), Giancarlo Marcone (Universidad de Ingeniería y Tecnología) and Giles Spence-Morrow (Vanderbilt University)**

[9]

*Deploying GeoPACHA: An Overview of Results from Stage One*

In this talk, we present a brief summary of the results from GeoPACHA's first survey campaign, followed by several illustrations of the potential of integrating data across subprojects and a discussion of future phases of collaboration. Phase 1 included six survey projects distributed across the Central Andes, totaling about 185,000 km<sup>2</sup> and registering about 39,000 archaeological loci. We highlight potential for data integration across projects by comparing the results of the survey of terraces in the northeastern and southern Peruvian Andes and use contrasting patterns of surface visibility in these distinct regions to discuss how GeoPACHA handles inter-user and interregional variability. We then discuss the next phases of the project, which will integrate our brute-force survey results as training data for a deep learning approach, which will in turn enable further upscaling through AI-assisted methods.

**VanValkenburgh, Parker (Brown University)**

[9]

*Chair*

VanValkenburgh, Parker [214] see Plekhov, Daniel

VanValkenburgh, Parker [9] see Wernke, Steven

VanValkenburgh, Parker [9] see Zimmer-Dauphinee, James

Varien, Mark [152] see Coffey, Grant

Varney, R. A. [39] see Jones, KC

Varney, R. A. [39] see Scott Cummings, Linda

Varney, Tamara [166] see Brown, Matthew

**Varoner, Oz (Israel Antiquity Authority), Ofer Marder (Ben-Gurion University of the Negev), Meir Orbach (Zinman Institute of Archaeology, University of Haifa), Reuven Yeshurun (Zinman Institute of Archaeology, University of Haifa) and Yossi Zaidner (Hebrew University of Jerusalem)**

[191]

*Lithic Provisioning Strategies at the Middle Paleolithic Open-Air Site of Nesher Ramla, Israel: A Case Study from the Upper Sequence*

In this study we focused on the identification of the provisioning strategies in the upper part of the Nesher Ramla sequence ("Pelvis Horizon" from Unit I and the "Stones Horizon" from Unit IIb). We applied survey of raw material sources, typo-technological analyses of the archaeological assemblages, and a taphonomic-taxonomic analysis of the faunal assemblages. Our study demonstrates that different lithic provisioning strategies were practiced in each horizon. The findings from the "Pelvis Horizon" offer strong evidence for hunter-gatherers' personal toolkits and the dominance of the provisioning of individuals strategy. The 'Stones Horizon' produced a mixed signal, containing evidence for both intensive in situ knapping and mobile toolkits. The faunal remains echo these differences: compared to the "Stones Horizon," the zooarchaeological assemblage of the "Pelvis Horizon" presents lower frequencies of bone fracturing, anthropogenic modifications, and burning. Accordingly, during the accumulation of the "Pelvis Horizon," the site most likely functioned as an ephemeral hunting station, whereas during the accumulation of "Stones Horizon" it hosted a broader range of activities and longer occupations. These observations suggest important shifts in the use of the Nesher Ramla site and shed light on the Middle Paleolithic sites' function and provisioning strategies.

**Vaughn, Kevin (University of California, Riverside) and Christina Conlee (Texas State University)**

[129]

*Reconsidering Absolute Chronologies from the South Coast of Peru*

Historically, the South Coast of Peru has been central to the formulation of chronologies in the Central Andes. In this paper, we critically evaluate chronologies that have been developed for the South Coast by reviewing radiocarbon dates (augmented by OSL and obsidian hydration) from fieldwork at nearly a dozen sites from Ica to Nasca. Our analysis covers the Archaic through the colonial period and we compare our review to recent proposed chronologies of the region.

**Vaughn, Kevin (University of California, Riverside)**

[155]

*Discussant*

Vaughn, Kevin [51] see Eerkens, Jelmer

**Vázquez de Ágredos Pascual, María Luisa, Catarina Pereira Miguel (Laboratorio Hercules, Universidade Évora, Portugal), Sílvia Bottura (Laboratorio Hercules, Universidade Évora, Portugal), Cristina Expósito de Vicente (Universitat de València, Spain) and Maria do Rosário Martins (Laboratorio Hercules, Universidade Évora, Portugal)**

[18]

*Physicochemical and Toxicological Analysis in Old Drugs: Results and Challenges*

Archaeological perfumeries and historical *spezierias* preserve containers with remains of the drugs that were prepared and sold for the treatment of the disease in other cultures of the past. The identification of the complex formulations that were used for their elaboration represents a challenge, since it requires the optimization of multiethnic methods, capable of identifying mineral and organic substances, as well as their degradation markers. The latter is also essential in the toxicology studies, which we have carried out in the research project: "Roma Hispana. Artificial Intelligence and New Technologies Applied to the Study, Musealization, and Dissemination of Spanish Cultural Heritage in Rome: La spezieria de Santa Maria della Scala." In this communication we present the multi-technical method used to identify the drugs that were used between the end of the nineteenth century and the beginning of the twentieth century for the treatment of mental illness (bipolar disorder, schizophrenia, hallucinations, etc.), as well as the results obtained, which we contrast with those developed in the last year in another similar context: the Gibert *botamen* (eighteenth century) of the Hispanic Pharmacy Museum.

Vázquez de Ágredos Pascual, María Luisa [155] see Vidal-Lorenzo, Cristina

**Vázquez de Arthur, Andrea**

[55]

*Depicting the Dead: Facenecks as Ancestral Portraits during the Middle Horizon*

In Western art, portraiture is typically defined as the representation of a specific, named individual, with the objective of recalling their presence, essentially acting as a visual memory. Might Andean portraiture serve a different goal? Maarten Van de Guchte's discussion of Inka *huauques*, or brother-statues, describes a kind of portrait-object that was used not to commemorate the Inka, but rather one that served as the ruler's double, and which could stand in for him in his absence. This implies that the concept of human representation may have worked differently in the ancient Andes than in the West. While *huauques* represented the living Inka, this paper investigates the potential for Wari facenecks to have served as portraits of the ancestral dead. Though the faces on faceneck vessels are not individualized, other details may depict distinctions in status, profession, and gender, suggesting specificity in the person being represented. As vessels, facenecks invite being fed, just as ancestors require nourishment in return for their benevolence toward the living. Such an interpretation of facenecks requires considerable reshaping of the construct of portraiture, and this paper will consider how fitting facenecks into the category of portraiture may shed light on their nature as ritual objects.

Vázquez López, Verónica [11] see Kupprat, Felix

Vazquez Martinez, Alia [146] see Fábregas Valcarce, Ramón

**Veerasamy, Selvakumar (Tamil University)**

[80]

*Colonial Indenture Labor Migration from South India and Their Cultural Adaptations*

One of the major developments during the colonial period in South India has been the intensive employment of labor for market economy. After the abolition of slave trade, indenture labor force from India was taken to different parts of the Indian Pacific, and Atlantic Oceans. In studying these migrations there has been increased interest in exploring the role of social and cultural institutions people brought with them, including education, media and religious practices, in negotiating (Khan 2021) alien landscapes and working under difficult circumstances. This paper focuses on the cultural and material contexts of South Indian communities from which the Diaspora emerged to better explain the cultural landscapes laborers created in their new homes. Specifically I focus on the location, placement and meaning attached to shrines and celebrated festivals.

Vega, Enrique [181] see Leroy, Stéphanie

**Velasco, Matthew (Cornell University), Tiffany Tung (Vanderbilt University) and John Krigbaum (University of Florida)**

[193]

*From Group Boundaries to Embodied Subjectivities: Theorizing Cranial Modification and Isotopic Variation in the Ancient Andes*

Cranial modification studies in the Andes typically chart correspondences between regions, head shapes, and other indicators of group identity, to show how boundaries between different ethnic communities were negotiated through the body. Meanwhile, the lack of a statistical relationship between cranial modification and skeletal sex has led these same studies to argue that the practice was unrelated to gender. This focus on inter-group differentiation overlooks evidence that does not parse neatly into binary categories of us and them, modified or unmodified, or male and female. Drawing from ongoing and published multi-isotope research from the Colca Valley, Peru (1100–1450 CE), this paper shifts the focus from identifying ethnic groups to exploring variation within them. Results show that modified and unmodified individuals do not segregate into distinct groups based on diet or geographic origin. However, subsets of modified individuals based on age and/or sex exhibit greater variability in  $\delta^{13}\text{C}$  and  $^{87}\text{Sr}/^{86}\text{Sr}$  from dental enamel and  $\delta^{15}\text{N}$  from bone collagen, pointing to diverse dietary and mobility patterns in childhood and adulthood. Understanding the embodied subjectivities of modified persons requires attention to (1) the specific histories of sites, (2) the intersections of ethnicity/gender, and (3) Andean social forms predicated on unity through diversity.

**Velasco, Matthew (Cornell University)****[193]***Chair*

Velasco, Matthew [82] see Whittemore, Anna

Vella, Marc-Antoine [87] see Bowen, Corey

Vellanoweth, Rene [131] see Ainis, Amira

**Venter, Marcie (Murray State University)****[145]***Discussant***Ventresca Miller, Alicia (University of Michigan)****[122]***The Spread of Herds and Horses into the Altai: How Livestock and Dairying Drove Social Complexity*

The initial movement of herders and livestock in the eastern steppe is of great interest, as this region is traditionally a pastoralist realm. It has been difficult to discern the timing of the adoption of domesticated ruminants and horses, yet recent research on ancient dairying have drastically altered our understanding of the prehistory of the region. Proteomic and isotopic research have led to the identification of a tripartite process in the introduction of domesticated species—from initial use, to full adoption, and the intensified management. As livestock become a larger part of local economies, the impact of pastoralists and their herds often intensify. As a result, the rise of social complexity in western Mongolia is evident based on population growth, the establishment of cemeteries, and the erection of large monuments. These broad changes occur in tandem with the first evidence for horse dairying. However, many of these changes occurred over long time scales and were fueled by an investment in ruminant pastoralism. The spread of herds, and then horses, into the Mongolian Altai resulted in steady changes to local economies, with subsequent social and demographic transformations occurring much later.

**Ventresca Miller, Alicia (University of Michigan)****[99]***Discussant***[99]***Chair*

Ventresca Miller, Alicia [99] see Miller, Bryan

Ventresca Miller, Alicia [23] see Tomazic, Iride

Ventresca Miller, Alicia [99] see Wilkin, Shevan

**Ventura, Renzo and Ana Mauricio (Pontificia Universidad Católica del Perú)****[3]***The Preceramic Complex of Pampa de las Salinas: Environmental and Cultural Context for the Rise of Monumentality in the Chao Valley*

The Preceramic Ceremonial Complex of Pampa de las Salinas is located in the lower Chao Valley of the northern coast of Peru. Geoarchaeological investigations carried out since 2012 have identified the appearance of monumental structures before 5100 cal BP and the consolidation of Pampa de las Salinas as a ceremonial complex around 4500 cal BP. This complex reached its peak around 4000 cal BP with the construction of several ceremonial structures including geoglyphs and large monumental buildings. The evidence from Pampa de las Salinas provides an alternative view for the origin of monumentality and social complexity in coastal Peru. Contrary to the majority of early coastal monumental sites, in Pampa de las Salinas we have been able to document the process of this development, as well as, the role played by the local setting and the local populations.

Vera, Sergio [150] see de la Fuente, Guillermo

**Verdugo, Cristina (University of California, Santa Cruz), James Brady (California State University, Los Angeles) and Lars Fehren-Schmitz (University of California, Santa Cruz)****[177]***A Further Illumination of Postmortem Practices at Midnight Terror Cave Using Paleogenomics*

Midnight Terror Cave (MTC), Belize produced a scattered and commingled human skeletal assemblage of over 10,000 elements. Paleogenomic investigation identified two instances of skeletal elements (VI-02b-118/VIII-13-2008 and VI-01b-18/VIII-13-2009) separated by great distances belonging to the same individual. A similar result was found in testing samples (CD1-04-2-2/CD2-01-6b/ CD3-4-1/CD4-00-1) from the Cueva de El Duea at Dos Pilas, Guatemala. The matches were detected while examining the autosomal genomes for relatedness. The results were unexpected as our sampling strategy was designed to avoid sampling individuals more than once. During the field survey, large, naturally bounded segments of the caves were designated "Operations" and discreet deposits within Operations were recorded as lots. In the laboratory, elements were selected from different Operations

and Lots. All matching elements come from different Operations within the caves. At MTC, these Operations are far apart and separated by an additional chamber. The results suggest a degree of deliberate movement and scattering which has significant implications for our interpretation of the assemblages. Furthermore, the elements (teeth, phalanges, vertebrae, and bone fragments) would be impossible to match to specific individuals without DNA analysis.

Verdugo, Cristina [177] see Brady, James

Verdun de Silva Carmo, Renata [148] see FitzPatrick, Mackinley

**Veres, Matthew (University of Georgia), Suzanne Pilaar Birch (University of Georgia) and Robert Kelly (University of Wyoming)**

**[198]**

*Searching for Environmental Signatures: Stable Isotopes from Faunal Bone Collagen at Alm Shelter, Wyoming*

The Alm Shelter is located in the Bighorn Mountains of northwestern Wyoming and was occupied over a span of 12,000 years, providing an exceptional record of human response to environmental fluctuations throughout the Holocene. Local data are key when examining environmental factors archaeologically, since large climatic events vary geographically in their impacts. This paper presents pilot  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  data to evaluate faunal bone collagen preservation at the site during three climate events: the Pleistocene–Holocene transition at 11.6 ka, the 4.2 ka event, and a regional megadrought around 800 cal BP. A previously generated age model was used to identify excavation levels encompassing these periods. Carbon and nitrogen isotopes allow for investigations into broad vegetative land cover and aridity. These data were then entered into the Neotoma Paleocology Database (neotomadb.org), which allows for further contextualization of the isotopic data through comparisons with other searchable local and regional datasets, such as pollen or diatoms, to assess multiple proxies of regional environmental change.

Vermeersch, Shyama [16] see Starkovich, Britt

**Vernon, Kenneth (University of Utah), Jerry Spangler (Colorado Plateau Archaeological Alliance), Brian Coddling (University of Utah), Weston McCool (University of Utah) and Peter Yaworsky (University of Utah)**

**[47]**

*Resilience to Climate Change among Farmers in the Basin-Plateau Region*

Climate-induced reductions in water availability pose a serious threat to farmers in arid environments, just as it did for Fremont maize farmers living at the intersection of the Great Basin and Colorado Plateau physiographic regions. The Fremont, thus, provides an important case study to examine the resilience of ancient farmers to climatic downturns. Using a tree-ring- and simulation-based reconstruction of average annual precipitation and two cost-distance measures, one to springs and the other to streams, we generate a point process model to analyze spatial variability in Formative period Fremont site density. The results have implications for defining the ecological envelope in which farming is a viable strategy across this arid region and can be used to predict where and why maize farming strategies might collapse as climate changes over time.

**Vesteinsson, Orri (University of Iceland)**

**[120]**

*Geographical Knowledge, Exploration, and Colonization*

Narratives of colonization and first peopling frequently begin with tales of exploration and discovery, as if knowledge of a previously unknown place must result in its occupation. This is not so. Knowledge of the existence of a place is of course a precondition for its occupation, but it is not on its own the cause of the colonization. Geographical knowledge can in fact both facilitate and prevent colonization, and to model colonization events in prehistory, it is necessary to develop theoretical understanding of the relationship between the generation of geographical knowledge through exploration on the one hand, and people's behavior and agency on the other. This paper will consider cases of discovery in world history that did not result in colonization and examine how they shaped world views that in turn defined the scope of people's actions. On these grounds, a theoretical framework will be outlined which helps explain both episodes of rapid and long-distance colonization and protracted periods of non-colonization of habitable places.

**Vianello, Andrea (University of South Florida), Rays Jiang (University of South Florida), Swamy Rakesh Adapa (University of South Florida), Greg O'Corry-Crowe (Florida Atlantic University) and Karen Hendrix (University of Sydney)**

**[111]**

*Revealing Pathogens in Possible Justinianic Plague Victims at Jerash (Jordan) ca. 650 CE*

This study of five possible plague victims from Jerash, Jordan, has targeted evidence of pathogens using aDNA, proteomics, and stable isotopes. Full sequencing of genetic material from teeth and other analyses on enamel, if possible, can reconstruct pathogens preserved in the mouth and reconstruct the oral microbiome and diet. The individuals were found in a funerary context that suggests quick burial probably due to an epidemic, and are part of a group dating to the time of the Justinianic plague, ca. AD 650. The site was located within a trade network connecting post-Roman, Byzantine, and Sasanian centers across the Middle East, and it was an important settlement in the region. Results from aDNA and other analyses should reveal the general state of health of these individuals, and the complex interactions among pathogens that may have existed (e.g., secondary infections). Early epidemics of bubonic plague (Justinianic and Black Death) have stretched for centuries producing isolated outbursts and localized epidemics, which have been credited exclusively to one pathogen, *Y. pestis*. The main objective of this study is to reveal interactions and coevolutionary processes that made possible unprecedented recurring and serious epidemics.

**Vidal Guzmán, Cuauhtémoc (George Washington University)****[35]***Political History beyond the Codices: Understanding the Role of Omitted Polities in the Postclassic Mixteca Alta*

The Mixteca Alta of Oaxaca is fortunate to have an impressive corpus of pre- and postconquest ethnohistorical codices that depict intricate political narratives. Yet, heavy reliance on these sources provides an incomplete picture in which only the histories of polities mentioned in the texts are taken as important; meanwhile, the histories of less discussed communities are given secondary status. In this paper, I use two lines of evidence, least-coast path analysis and ceramic analysis, in order to advance the position that overreliance on written sources may hinder our efforts to better understand the internal political dynamics of the Nochixtlán valley during the Postclassic period. I use the case of the polity of Etlatongo, a community located at the center of the Nochixtlán valley, but at the periphery of Postclassic Mixtec academic discourse, to highlight how sites barely mentioned in the codices could have actually played very important roles in the webs of relationships that unfolded during the latter part of precolumbian history.

**Vidal-Elgueta, Alejandra (Pontificia Universidad Católica de Chile), Hannetz Roschztardt (Pontificia Universidad Católica de Chile), María Fernanda Pérez (Pontificia Universidad Católica de Chile), Christian Dubos (French National Institute for Agriculture, Food, and Environment [INRAE]) and Mauricio Uribe (Universidad de Chile)****[74]***2,000 Years of Agriculture in the Atacama Desert Led to Changes in the Distribution and Concentration of Iron in Maize*

The future of food production has seen a renewed discussion among the scientific community concerned with the decline of micronutrients in crops such as maize. Different studies empathize the decrease of iron after intensive agriculture and hybridization of crops during the 1960s, the so-called Green Revolution. However, the mechanism by which this shift took place is still under debate. Thus, we sought to establish the presence or absence of iron in archaeological maize under constant manipulation by prehispanic groups in Tarapacá, Atacama Desert, Chile. Through histological and staining approaches we analyzed 21 samples of archaeological kernels and observed the distribution and quantities of iron from a historical perspective, covering a temporal sequence of 2,000 years. Our results show a progressive decrease in iron concentration from the oldest maize (2400 yrs BP) to modern specimens. These changes in Iron amount and distribution in maize preceded the Green Revolution and modern agriculture and provide an example of how prehispanic agricultures affected the micronutrient composition of maize. We finally discuss the implication of the results for artificial selection of ancient crops.

**Vidal-Lorenzo, Cristina (Universitat de València), María Luisa Vázquez de Ágredos Pascual (Universitat de València), Núria Feliu Beltrán (Universitat de València), Catarina Pereira Miguel (Universidad de Evora) and Carlo Emanuele Bottaini (Universidad de Evora)****[155]***Pigments and Color Technology among the Ancient Mayas: The Mural Painting of Substructure 6J2-sub.2 of the Acropolis of La Blanca, Petén, Guatemala*

The discovery of a mural painting in Substructure 6J2-Sub.2 of the Acropolis of La Blanca (Petén, Guatemala), a building of unique typology and which exhibits an exceptional sculptural relief, encouraged new physicochemical and cultural studies of the coloring materials that were used in its creation, especially considering the few murals that have survived in the tropical forest of the Maya Lowlands. After an initial inspection of the mural, which revealed the chromatic variability preserved, a representative sample of the color palette was taken and analyzed in the laboratories of the Science Park of the University of Valencia and the Hercules Laboratory of the University of Evora (Portugal). The analytical protocol for the characterization of layers underlying paintings, binders and pigments was based on the combination of several instrumental techniques: light microscopy (LM), scanning electron microscopy-X-ray microanalysis (SEM-EDX), Fourier transform infrared spectroscopy (FTIR), Raman spectroscopy (RAMAN) and X-ray fluorescence (XRF). The results, while confirming the use of the dyestuffs that were common in Classic Maya mural painting, stimulate further research into the manufacturing processes and color technology of the so-called "hybrid pigments," especially Maya blue.

Vidhyarthee, Vaneshree [149] see Chauhan, Parth

**Villasenor Iribe, Eunice (Arizona State University) and Christopher Morehart (Arizona State University)****[172]***A Statistical Comparison of the Physical Characteristics of Terracing in the Basin of Mexico*

The Basin of Mexico is a culturally and environmentally dynamic region that has been occupied for thousands of years. The region is semi-arid in climate, which has made large-scale habitation difficult without modifications of the landscape. One such type of modification that has been utilized by a variety of ancient groups is agricultural terracing. Previous studies of terracing in the Americas have found that terraces often occur within a limited range of topographic conditions. This range may indicate where terracing was viewed as being the most productive. Understanding how terracing was applied at a variety of archaeological sites in the Basin of Mexico provides insight into the planning of agricultural production in the region. This analysis is based on the mapping of terrace features among four separate hilltops: Cerro Ahumada, Cerro Gordo, Cerro San Lucas, and Cerro Chiconautla. The terrace features for each site were then analyzed to determine if they occurred within a specific range for slope, vegetation cover (NDVI), soil moisture (NDMI), and aspect. The results support the idea that there does appear to be a general topographic range for agricultural terraces which may correspond to a limit for productivity.

**Vining, Benjamin (University of Arkansas, Fayetteville), Daniel Contreras (University of Florida) and Aubrey Hillman (University at Albany–SUNY)**

**[88]**

*Archaeological and Ecological Evidence for El Niño-Driven Expansion of Agroecological Niches on Peru's North Coast*

Archaeological sites are prevalent in the intervalley deserts of coastal Peru. Various archaeologists have linked occupation in currently hyperarid and seemingly inhospitable regions to periods of increased ENSO activity. Testing this proposition requires not only paleo-ENSO data but also spatially explicit modeling of ENSO effects. We address the questions of how, where, and for how long ENSO affected the Chicama Valley through a coupled model that integrates archaeological, paleoclimatic, and geospatial analysis of the 2016–2017 Eastern Pacific el Niño event (EP-ENSO). This approach quantifies and explicitly spatializes the ecological effects of recent ENSOs, providing an analogue for the effects of paleo-ENSO activity. Archaeological sites dating to periods of intensified paleo-ENSO activity are widespread in areas where primary productivity increased during the recent EP-ENSO. Conversely, occupation decreases in these areas during periods of lesser paleo-ENSO activity. This pattern, we argue, demonstrates that ENSO can dramatically expand potential agroecological niches, which could have been capitalized on with modest investments of human effort. These results provide a more holistic view of the ecological dynamics driven by ENSO and support recent proposals that pre-European societies mitigated adverse impacts of El Niños through resiliency strategies.

Vinola Lopez, Lazaro [114] see Luthra, Alisa

**Vivanco, Ivan (Pontificia Universidad Católica del Perú)**

**[84]**

*El paisaje sagrado, espacio y arquitectura en los Andes Orientales, Ayacucho*

El paisaje en el mundo andino antiguo es una construcción social que fue materializada por los diferentes grupos humanos que ocuparon un espacio determinado creando identidades y una memoria colectiva social desde la época precolombina en los Andes Orientales al noreste de la región de Ayacucho. Repensar el dinamismo del paisaje a través del uso de categorías andinas para tratar de entender el mundo andino desde el enfoque de las ontologías andinas en el registro arqueológico, en la cadena montañosa de este a oeste que forma la "oreja de perro" en el límite de territorios en los departamentos de Ayacucho, Apurímac y Cusco, y naturales por parte de los ríos Pampas y Apurímac. Las formaciones sociales del HM, PIT y HT materializan su poder a través de la arquitectura emplazado en espacios de carga simbólica bajo un sistema de organización política, económica y social vinculados a elementos culturales. Siendo Pumachaka la deidad más sagrada del caso de estudio y siendo un lugar obligado en la red vial que articula los caminos entre el hombre de las tierras altas y de las tierras bajas en una interacción intensiva de orden social y económica en las cinco ecozonas del área de estudio.

**Vivero Miranda, Jose**

**[176]**

*Comparative Analysis of Rio Sonora Ceramics: Implications for Regional Identities*

For decades archaeologists have described Rio Sonora ceramic traditions as dominated by diverse textured wares, including incised, punctated, corrugated, brushed, and others. There has been no serious attempt to identify distributional patterning at smaller scales in the frequencies of various layouts and styles. This poster addresses this issue through the analysis of legacy collections (Sonora Valley) and previously collected data (Fronteras and Moctezuma Valleys). The analysis indicates clear differences exist in the frequencies of styles and layouts between different valleys of the Rio Sonora region. Most valleys have at least one distinctive style or layout that is rare in neighboring valleys. The analysis also indicates less clear but statistically significant differences in style and layout frequencies identifiable at smaller geographic scales, including between sites and even within some sites. These differences pertain to various aspects of identity expressed at different spatial scales.

Vlcek, Dave [162] see Bies, Michael

**Vo, Thuy (Vietnam Academy of Social Sciences) and Roland Fletcher (University of Sydney, Australia)**

**[218]**

*Extensive, Low-Density Settlement Patterns of the Vietnamese Cultural Tradition*

Interpretations of the history and form of the urban settlements in Vietnam have been strongly affected by assumptions about urbanism from China and Europe. However, if we set Vietnamese urbanism in the context of Southeast Asia and look beyond the citadel walls, we can see a long history and a pattern of urban settlement including open agrarian space and varying degrees of occupation. The largest settlements in Vietnam utilized this tradition of enclosures from the fourth century BCE to the nineteenth century CE, from the north to the south of the country. In most urban sites, the additional outer boundaries protected a major part of the occupation outside the built walls or embankments of a central citadel. That outer part of the settlement, where the general populace lived and where many social-economic activities occurred, should be considered a crucial part of the urban area as well as the citadel. As a consequence, urban research should expand outside the citadel to the areas protected by the extended boundaries. The old criteria borrowed from Western or Chinese urbanism and imposed on the study of Vietnamese urbanism need to be reconsidered in terms of a local tradition of the society.

**Voorhies, Barbara (University of California, Santa Barbara) and Douglas Kennett (University of California, Santa Barbara)**

**[154]**

*7,000 Years of Human Presence in Coastal Wetlands of Southwestern Mexico*

The most extensive, mature mangrove forest of the Pacific coast of Mexico is located at the southernmost end of the country. The forest is situated within an estuarine-lagoon system that has been relatively stable over time, despite the well-known ephemeral nature of such coastal formations. This ecosystem, and the older paleoestuary adjacent to it, are the settings for the oldest known archaeological sites of coastal Mexico. We discuss the archaeological methods that we employed in our investigations of these archaeological sites, and how the ancient people who formed them were using this environment. We also consider how subsequent ancient farming people devised some new ways to adapt to this environment and how people today use this ecosystem.

**Voss, Barbara (Stanford University)**

[121]

*Transformative Relationships, Enduring Partnerships: Archaeological Practice as Community Building*

Long before archaeologists began to explicitly incorporate community-based participatory research into their project designs, Kent Lightfoot modeled deep and sustained collaboration with descendants and other stakeholders. Rarely stated but clearly demonstrated was the core principle that present-day relationships and community building are as central to archaeological research as the study of the past. Reflecting on my experiences as a student involved in research at Colony Ross in the 1990s, this paper charts how Lightfoot's approach has influenced my investigations of Chinese diaspora sites in the US West and Chinese migrants' home villages in Guangdong Province. By approaching archaeology as a practice of relationship building, this research has been organized through sustained involvement of non-archaeology experts including individual descendants, nonprofit heritage organizations, history museums, artists, writers, and scholars in non-archaeology fields. Both the didactic and affective qualities of these relationships have transformed not only the interpretation of the archaeological record but the core paradigms and methodologies used in archaeological practice.

**Voss, Barbara (Stanford University)**

[12]

*Discussant*

**Vostretsov, Yuri**

[135]

*Discussant*

**Vranich, Alexei (UTSA), Erik Marsh (National University of Cuyo) and Andrew Roddick (McMaster University)**

[87]

*The Lake Titicaca Architectural Tradition from the Formative to the Tiwanaku Periods*

For political and social reasons, the search for an analog to explain the Tiwanaku phenomenon falls upon the later empire of the Incas and other primary states of the Old World, such as Egypt or Mesopotamia. Part of the intent was to counteract centuries of bias against Indigenous accomplishments by demonstrating that Tiwanaku was comparable to better-known examples of powerful and complex civilizations. However, one of the unintended effects of this comparison is a separation of Tiwanaku from its cultural and historical context. This presentation changes the perspective and looks to the previous period to measure the degree that the Formative period institutions form the basis for the later period Tiwanaku site. The result shows a strong continuity in basic ritual form along with elements of innovation.

Vujevic, Dario [226] see Zaro, Gregory

Wade, Angela [140] see Krasinski, Kathryn

**Wade, Mariah and Laure Dussubieux (Chicago Field Museum)**

[132]

*Ancient Glass at the Western Edge of the World: Samples from Portugal*

Located at the western end of the Roman Empire, it makes sense to think solely of secondary production for the northern part of Iberia and, as yet, of few regional production centers. The present study incorporates results from a previous study, and together they include 93 glass samples from nine different sites all from the western littoral portion of modern Portugal, except for three samples from the Castro do Cabeço, Chaves. Bracara Augusta is the only documented production center included in the study, and it is represented by samples from four different archaeological locales within Bracara. All samples were studied by laser ablation inductively coupled plasma mass spectrometry (LA-ICP-MS). Though this is a work in progress, the identified compositional groups indicate imports from primary workshops with an Egyptian and Syrian-Palestinian chemical fingerprint, with predominance of HIMT and weak HIMT (HIMT2). Weak HIMT samples and others hint broadly at logic recycling practices and workshop pollutants.

**Wadford, Tabatha (Middle Tennessee State University), Adam Fracchia (University of Maryla), Tiffany Saul (Middle Tennessee State University), Cole Buffalini (Middle Tennessee State University) and Morgane Morin (Sciences Archeologiques a Bordeaux)**

[169]

*For Both the Living and Dead: Building Collaboration and Partnerships in a Forensic Recovery Mission*

For nine weeks in the summer of 2021, a multi-university team led by Middle Tennessee State University conducted a forensic recovery mission on a World War II aircraft crash for the Defense POW/MIA Accounting Agency (DPAA) in France. Two years in the

making, the mission had to navigate the current pandemic, the requirements of various institutions, the regulations of two nations, and the challenges of running a field program without students. While limiting, the many needs of the mission actually engendered both flexibility and a reliance on many partners. Through these partnerships, the mission was able to build new relationships and foster collaboration. Thus, the mission not only worked toward the recovery of the MIA for their families, the relationships made allowed for opportunities for training, understanding, and mutual benefit for everyone.

Wagner, Emma [108] see Smith, Alexander

**Wagner, Mark**

[77]

*Bound to the Western Waters: The Discovery of Lewis and Clark's Lost Outpost of Ft. Kaskaskia, Illinois*

In November 1803, the Lewis and Clark Expedition led by Meriwether Lewis and William Clark stopped at the small US Army outpost of Ft. Kaskaskia in Randolph County, Illinois, to obtain 12 men including one of the chroniclers of the expedition—Sergeant Patrick Gass—as well as supplies for their expedition to explore the Louisiana Territory. Abandoned by 1807, the site of this small fort rapidly disappeared into obscurity and became confused with an earlier 1750s French colonial fort (11R326) of the same name. Archaeological investigations by the SIU Carbondale field school starting in 2017 succeeded in relocating the American Ft. Kaskaskia (11R612), including a subsurface cellar that has produced a wealth of early 1800s US Army artifacts identical to those used by the soldiers on the expedition. This and other information recovered by our investigations at both the American fort (11R612) and the abandoned nearby French colonial fort (11R326) that the US Army also utilized have succeeded in clarifying the early history of the Lewis and Clark Expedition just prior to its departure from St. Louis a few months later to reach the “western waters” of the Pacific Ocean.

**Wai, Christopher (University of Toronto)**

[78]

*Strategies in the Archaeological Use of Real-Time Kinematic Mapping in North Coast Peru and Cambodia*

The use of Real-Time Kinematic (RTK) presents a revolutionary opportunity for archaeologists to rapidly map sites or set up accurate datums for more traditional total station or mechanical transit methods. They may also overcome several common logistical and methodological issues in conventional methods (e.g., uneven terrain, cost, sightlines, back station benchmarking, etc.). At the same time, current forms of RTK have some problems that prevent them from necessarily replacing traditional methods (e.g., signal quality and interference). Here, I examine two case studies and cross-compare the efficacy of mapping strategies with Emlid Reach RS/RS+ receivers on two very different projects. The first used a mixed Nikon total station and RTK strategy at Prasat Khna (~tenth century CE), an Angkorian temple complex in the dense jungle of Cambodia. The second employed a combination of these receivers and DJI Phantom 4 Pro drone imagery to map Cerro Prieto Espinal, a Late Moche–Late Intermediate period (~650–1470 CE) mountainside fortification, in northern Peru. Comparing the data of these two expeditions, I present some core strategies to promote their use for small-scale, cost-prohibitive projects and larger, better-funded projects, whether they be in academic, salvage, governmental, or avocational contexts.

**Wake, Thomas (Cotsen Institute of Archaeology at UCLA)**

[45]

*Kent Lightfoot and the Zooarchaeology of Traditional Foodways*

Working with Kent Lightfoot has profoundly influenced the way I view animal remains recovered from archaeological sites. Traditionally, zooarchaeological specimens are used to provide information concerning subsistence focus, past environments, and hunting and animal husbandry practices. These same specimens also provide a wealth of information concerning personal and group food choices, butchery practices, social status, and cultural affiliation of their depositors. Here I consider how patterned food remains elucidate the persistence of cultural identity, social status, and traditional foodways in both “Historic” and “Prehistoric” archaeological contexts based on research conducted and/or begun during my time as his graduate student at the University of California, Berkeley.

**Walden, John (Max Planck Institute for Evolutionary Anthropology), Claire Ebert (University of Pittsburgh), Julie Hoggarth (Baylor University), Yijia Qiu (University of Pittsburgh) and Jaime Awe (Northern Arizona University)**

[54]

*House Size Reflects Local-Level Variability in Wealth Inequality in the Classic Maya Belize River Valley*

Traditional approaches to understanding wealth inequalities among ancient complex societies have focused on variability between regions or state-level entities. Increasingly robust metrics of wealth inequalities and the availability of higher resolution household-level data allow for the reconstruction of wealth inequalities at local levels. This presentation focuses on generating measures of wealth inequality at the Classic Maya polities of Baking Pot and Lower Dover in the Belize River Valley. Robust settlement datasets based on pedestrian survey and lidar data exist for both polities and their associated settlement systems. Volume of residential architecture is used as a proxy of labor investment which reflects the relative wealth of apical and intermediate elites and commoners. Analysis of residential architecture using Gini coefficients and Lorenz curves reveals localized variability in wealth at both the district and polity levels. These patterns are associated with the divergent urban trajectories through which the two polities formed, and variability in the political strategies which the apical and intermediate elites employed in their relationships with commoner subordinates. The results reinforce the importance of local-level political dynamics in shaping human lived experiences.

Walden, John [218] see Ebert, Claire

Walden, John [54] see Shaw-Müller, Kyle

Walker, Bethany [158] see Romo-Caballero, Carlos

Walker, Cam [198] see Mack, Joanne

Walker, Danny [162] see Bies, Michael

Walker, Debra [11] see Kupprat, Felix

Walker, Debra [48] see Reese-Taylor, Kathryn

**Walker, Emily (Hamilton College), Lacey Carpenter (Hamilton College) and Sofia Pacheco-Forés (Hamline University)**  
[69]

*Changing Relationships between the Mortuary Treatment of Children and Adults in the Valley of Oaxaca in the Formative and Classic Periods*

Researchers (Barber et al. 2013; Higelín Ponce de León et al. 201x) working in Oaxaca have noted an increase in the representation of children and infants in the mortuary record between the Formative and Classic periods and have suggested that the increased association between these younger individuals, adults, and domestic contexts indicates a shift to an emphasis on the domestic group in death. Specifically, this study builds on previous research to investigate the ways in which changes in burial practices during the Terminal Formative period may be interpreted as indications of the changing views of the relationships between adults and children in death. This changing relationship seems to be of central importance because, although more infants and children are certainly present in later periods, they generally remain in domestic contexts throughout these two later periods. Meanwhile, from the Terminal Formative period into the Early Classic period we see more adults interred in domestic contexts along with children, suggesting that perceptions of childhood have not only changed, but also perceptions of familial and age relations.

**Walker, William (New Mexico State University), Fumi Arakawa (New Mexico State University) and Chadwick Burt**  
[175]

*Life Histories of Kill Hole Pottery in the American Southwest*

"Kill holes" on Mimbres pottery are one of the hallmarks of the Classic Mimbres culture from AD 1000 to 1130. However, with the end of Mimbres culture, this practice initially continued in the Mimbres sites but subsequently spread west and north into Hohokam and Ancestral Pueblo regions in the thirteenth and fourteenth centuries largely in association with Salado pottery. In this poster, we track the life history (beginning, growth, and termination) of the "kill hole" tradition in the American Southwest by illustrating the spatial and temporal distribution of these artifacts. The results of this analysis confirm the movement of people and practices beyond the Mimbres-Mogollon cultural sphere during a time of ethnogenesis in the fourteenth and fifteenth centuries. Several Pueblo peoples established "cultural affiliations" between Mimbres peoples and historic and contemporary Native groups, such as Zuni and Hopi.

**Wallis, Neill (Florida Museum of Natural History), C. Trevor Duke (University of Florida), George Luer (University of Florida) and Michael Glascock (University of Missouri)**

[67]

*Sourcing Mississippian Pottery among the Complex Maritime Cultures of Florida's Peninsular Gulf Coast*

In the American Southeast, the largest and most complex Mississippian communities were characterized by maize agriculture, social stratification, large monumental projects, and iconography linked to an elite ideology, all commonalities tied to the historical process of "Mississippianization." At the edges of the Mississippian world, similar sociopolitical structures developed on the Gulf coast of peninsular Florida in association with a maritime economic foundation and distinctive local ideologies. The extent to which the Mississippian phenomenon intersected and influenced this region is debated, but Mississippian-style pottery vessels deposited widely in mounds and also in middens at the largest administrative centers provide conspicuous evidence of connections to inland Mississippians. Here we present the results of NAA of 260 Mississippian-related pottery vessels from 16 sites on Florida's peninsular Gulf coast. Production and consumption patterns show the role of these vessels in apparent shifts toward increasing sociopolitical complexity. Vessels at the largest administrative centers were almost exclusively local, while secondary centers and mounds had both local and nonlocal vessels, the latter from nearby large centers and distant agricultural polities. Greater political power in these complex maritime polities was tied to local production and reinterpretation of salient symbols and styles circulated among inland agriculturalists.

Wallis, Neill [39] see Cordell, Ann

Wallis, Neill [150] see Duke, C. Trevor

Wallis, Neill [39] see Farace, Anthony

**Wallman, Diane (University of South Florida)**

[80]

*Labor Restructuring and Provisioning in the Post-emancipation Caribbean: Examples from the Lesser Antilles*

Food provisioning was a fundamental aspect of labor for enslaved peoples on Caribbean plantations. Even on islands and estates where rationing was the primary system employed, enslaved communities were still obligated to supplement and produce at least some of their own food resources. Considerable scholarship has demonstrated that the subsistence practices developed during slavery contributed to post-emancipation communities and economies. The transition to freedom in the Caribbean varied from island

to island, depending on the conditions of emancipation. Chattel slavery was ostensibly eliminated, but formerly enslaved peoples were often forced to remain and work for their enslavers, or participate in “apprenticeships.” Further, the demographics of labor changed as many islands looked to South Asia for indentured servants. In this paper, I examine the transition to post-abolition life on two islands in the Lesser Antilles, Martinique (French colony) and Dominica (English colony), focusing on the development of provisioning systems after emancipation. I employ case studies from two eighteenth- to nineteenth-century plantations on these islands to examine foodways in post-abolition households, comparing how emancipation and labor restructuring impacted subsistence and domestic economies in different colonial contexts.

Walshaw, Sarah [186] see Quintana Morales, Eréndira

Walsh-Haney, Heather [46] see Duggins, Ryan

Walter, Philippe [155] see Sepúlveda, Marcela

**Wampler, Marc, John Hunter (Wood Environmental & Infrastructure Inc.), Hank McKelway (Wood Environmental & Infrastructure Inc.), Shannon Allen (Arnold Air Force Base) and Shawn Chapman (Akima Intra-Data)**  
[24]

*Cultural Resource Investigations at Arnold Air Force Base, Coffee and Franklin Counties, Tennessee*

For the past 13 years (2008–present), Wood Environmental & Infrastructure Inc. (Wood) has been independently contracted to conduct an array of cultural resource investigations at Arnold Air Force Base (AFB), located in south-central Tennessee. The investigations have included archaeological survey (16,825 acres) and National Register of Historic Places archaeological testing evaluations of 52 prehistoric and historic archaeological sites. Prehistoric components range from the regionally defined Early Archaic through the Late Woodland periods and historic occupation has pertained to late nineteenth and early twentieth century farmsteads. Intensive archival research was also performed for the former World War II African American barracks locale at the base (Camp Forrest). Archaeological test excavations were preceded by geophysical and geoarchaeological analysis as well as archival documentary, and mapping research, which facilitated efficiency of the excavation approaches. Native American consultation has also been an important aspect of the investigations. The culmination of the work serves as an important and instructive example of cultural resource management at a military facility. Research opportunities afforded Wood have provided information for comparison of prehistoric and historic archaeological data at Arnold AFB and the archaeological record of the Mid-South, revealing broader trends in settlement and subsistence patterns.

Wang, Chunxue [158] see Liu, Hailin

Wang, Chunxue [158] see Yu, Xin

**Wang, Jiajing**

[185]

*Human-Animal Relationship during the Longshan Culture: A Case Study of Kangjia*

The Longshan culture of Neolithic China is a period of significant social and environmental transformations. Animals played an important role in the economic, social, and symbolic systems in Longshan societies. Monogastric animals became the focus of animal husbandry, providing the main protein sources for general dietary wellbeing. Sheep and goats were newly introduced from western Eurasia, and their arrival revolutionized land-use patterns and provided increased food production. Both domesticated and wild animals played an integral part in rituals—they were sacrificed for religious ceremonies, offered as feasting food, and made into items of ritual paraphernalia. However, we still have rather limited knowledge about the animal management practices during this period. This research applies microbotanical residue analysis to a collection of animal teeth specimens from the Kangjia site in North China. The results suggest that some pigs at Kangjia were reared for ritual feasting and received special foods. Some wild animals, including deer, were likely raised in a human-controlled niche and consumed crops such as millet. This case study offers a lens to explore the interactive dynamics between humans, animals, agricultural production, and ritual activities during the Longshan period.

**Wang, Jiajing**

[185]

*Chair*

Wang, Li-Ying [40] see Park, Gayoung

**Wang, Qingzhu (Columbia University), Jianli Chen (Peking University), Siran Liu (University of Science and Technology Beijing) and Hui Fang (Shandong University)**

[32]

*Diachronic Changes in Lead Isotope Data for Bronzes and the Implications to the Shang Political Economy*

Archaeologists and archaeometallurgists have primarily applied lead isotope analysis to trace the provenance and movement of metals, a key aspect to understand the political economy of ancient societies. We revisit the published lead isotope data for China's Shang period (ca. 1600–1050 BCE) bronzes and propose a new perspective to interpret the published data. We identify two major shifts in lead isotope data, one during the Middle Shang period and the other in the Late Shang (Yinxu) phase II. Although the

reasons for the changes we observe are still unclear at present, these results offer a new standard for evaluating the circulation of metals in the Shang period and contribute a different avenue for investigating the sociopolitical and economic organization of the Shang society.

**Wang, Yifan (University of Illinois at Urbana-Champaign), Luxia Cheng (Shandong University), Yu Dong (Shandong University) and Cuimin Zhang (Dalian Institute of Archaeology)**

[32]

*Dietary Strategies and Subsistence Practice in the Liaodong Peninsula of Bronze Age China: Stable Isotopic Evidence from Yujia*

The subsistence pattern in the Liaodong Peninsula of China was dominated by hunter-gathers at its cultural peak during the late Neolithic time (5500–4000 BP), although millet and rice remains were found in several sites. During the subsequent Bronze Age, with the continuous cultural decline in this area, the development of agriculture remained an unanswered question. In this paper, we focus on ancient human diets in the Yujia Cemetery, a long-last Bronze Age graveyard in the Lidaodong Peninsula and carry out carbon and nitrogen stable isotope analysis with 10 samples of human remains. High carbon and nitrogen isotope values indicate a significant consumption of C<sub>4</sub>-based food and marine resources. Research of molar tooth wear, lithic tools, and carbonized plant remains have supported the hypothesis of the dominance of millet agriculture in Yujia. This study contributes to the understanding of general subsistence strategies in the Liaodong Peninsula during the Bronze Age.

**Wang, Yuyang (Stanford University)**

[185]

*Understanding Organic Material Processing in the Yiluo Region with Methods of Experimental Archaeology*

Use-wear analysis gives considerable insights into the practical use of lithic tools, helping us to determine how the tools were used, and what materials they worked on. We have recently discovered traces of high-level polish, oily looking, rounded edge, and no trace of striations on a stone knife 07-127w-93 from the site Huizui. Huizui, located in Henan, China, was occupied for a long period, from the middle and late Yangshao to Eastern Zhou. Previous studies suggest that tools with high polish and rounding were likely used to cut dry, siliceous plants, but these tools all display striations or multidirectional striations, unlike the Huizui artifact. These ambiguous combinations of markings leave questions that are difficult to answer with current research. This experimental study aims to re-create and identify similar traces on stone knife replicas with four different materials—leather, the bark of velvetleaf (*Abutilon theophrasti*), bark of paper mulberry (*Broussonetia papyrifera*), and bark of *Ficus virens*. This paper tries to employ methods of experimental archaeology to better understand organic material processing with lithic tools in the Yiluo region.

Wang, Zhijun [10] see Meyer, Michael

**Wang, Zichan, Andrew MacIver (UCLA) and Kirie Stromberg (UCLA)**

[107]

*An Integrated Approach to Migration and Power during the Longshan Period*

The Longshan (2300–1800 BCE) was a lynchpin period in the formation of Chinese civilization, a transitional stage during which a vast landscape dotted by relatively disparate Neolithic cultures became ever-more interconnected, laying pathways for early Bronze Age state-level societies to come. Characterized by the formation of dense networks of transregional migration from the Ordos highlands into the central plains through eastern coastal regions, in addition to new patterns of ritual practice and cultural exchange, Longshan society was dynamic, and an equally multifaceted approach is required in order to delineate its development. This paper proposes an innovative, integrated means of analyzing migration and power across several crucial zones during the Longshan. We use a GIS-based network analysis as a starting point in order to visualize pathways between settlements and possible migration patterns, then test those paths against a holistic assessment of the archaeological record at key sites, with focus on both traditional categories of evidence such as settlement walls, ceramics, and jades and less studied objects, such as bone jaw harps. This interdisciplinary set of methods allows for a uniquely rich picture of the Longshan universe.

**Wang, Zichan**

[107]

Chair

Ward, Grace [4] see Grooms, Seth

Ward, Grace [15] see Stauffer, John

**Ward, Timothy (Millsaps College), George Bey III (Millsaps College) and Dan Healan (Tulane University)**

[18]

*A Residue Analysis of Blanco Levantado, a New World Amphora: Evidence for Its Use to Collect and Distribute Miel de Maguey in the Tula Region (AD 900–1150)*

From AD 900–1150 Blanco Levantado was produced in the Tula region. This ceramic type is found in various forms in the Bajío during the Early and Late Classic. In the Tula region, however, only amphorae were produced. Mastache and Crespo located a number of probable Blanco Levantado ceramic workshops outside of Tula suggesting these amphorae were used as containers for a product associated with the rural zone. Bey's distributional and attribute analysis, combined with ethnohistoric information, argued Blanco Levantado was used to collect and distribute Miel de Maguey. This paper presents efforts to determine whether Miel de Maguey was being collected with Blanco Levantado vessels through the use of residue analysis. Biomarkers are compounds that

can be used to determine the presence of specific drinks, food, or other substances. In the case of archaeological artifacts, these biomarkers, when combined with relevant anthropological data, can provide insight into the culture, social interactions, and religious practices of civilizations. Analysis was performed by dremmeling the exterior surface of the vessel, followed by dremmeling the inside and collecting it for analysis. The dremmeled inside layer of the samples were then extracted, centrifuged and filtered. Samples were then processed and analyzed by liquid chromatography-mass spectrometry.

**Warinner, Christina (Harvard University and MPI-EVA)**

[51]

*High-Altitude Food Culture in Prehistoric Nepal*

The high-altitude transverse valleys of the Himalayan mountains were among the last places permanently settled by humans in prehistory. Nevertheless, their strategic location between the Tibetan Plateau and the South Asian subcontinent has long made them dynamic interaction zones of trade and exchange. Here we review and present new evidence on sites in the Kali Gandaki Valley of north-central Nepal dating from ca. 1500 BCE to 650 CE and specifically focus on the diverse foods represented at the site and their varied histories. Using advanced biomolecular methods, we broaden understanding of the complex food culture of the ancient Himalayas and explore its enduring roots in long-distance trade and exchange.

Warinner, Christina [148] see Rest, Matthaeus

**Warner, Mark (University of Idaho)**

[81]

*From Peale to Trimble: Communicating with Collections*

Taking care of, working with, and managing archaeological collections is frequently viewed as a relatively undifferentiated issue. The reality, however, is that historical collections present a variety of challenges that are distinct from precontact materials. This paper highlights the challenges faced by people working with historical collections and it provides some summary commentary on Sonny Trimble's contribution to SHA and the organization's collections practices as well as his integral role in the establishment of the Archaeological Collections Consortium.

**Warner-Smith, Alanna**

[130]

*The Embodiment of Precarity in the Huntington Irish, Nineteenth-Century New York City*

The Huntington Anatomical Collection (1893–1921), housed at the Smithsonian Institution, is comprised of persons who died in public institutions around New York City at the turn of the twentieth century. Their corpses were subsequently dissected, a treatment justified at the time as allowing them to “repay” their debts to society. I focus on 174 Irish immigrants who are part of the collection. Because they died at institutions associated with poverty, it might be tempting to consider skeletal pathologies as indicative of urban poverty. However, I argue that poverty does not fully account for the complexity of experiences across the life course. Instead, I consider inequality in terms of precarity, which results in the differential exposure of bodies to harm and can vary across the life course, as persons inhabit different landscapes and social networks. In this paper, I draw on models of embodiment and precarity from public health to consider precarity experienced by Irish immigrants in my study, discussing evidence of trauma and labor in their skeletal remains and in almshouse ledgers. The precarity faced by these working class laborers was shaped by the racialization of the Irish, poverty discourse, dispersed social networks, and wider market booms and busts.

**Warren, Matthew (Historical Research Associates Inc.)**

[124]

*From Open Gateway to Closed Corridor: Examining the Inka Creation of a Fortified Frontier in the Valles Cruceños of Bolivia*

Beginning at least as early as 2500 BP, agriculturalist populations with cultural ties to the Amazonian lowlands began settling the *valles cruceños* in the southeastern Bolivian Andes, establishing connections with neighboring societies and migrating further into the Andean highlands and beyond. Until their much later incorporation into the Inka Empire, these terminal Andean valleys and the tropical slopes that bordered them represented an important corridor for the interregional movement of people and goods. The conflict between the Inkas and the Guarani-Chiriguano and the empire's ensuing fortification of the *valles cruceños* created a violent geographic schism between the southeastern Andes and the lowlands that would have long-term repercussions for the region and its varied populations. In this presentation, I will first review the pre-Inka settlement history of the *valles cruceños*, emphasizing the important influences of lowland Amazonian and Chacoan cultures on their early inhabitants. I will then describe the nature of the Inka occupation in the region as understood through archaeological and ethnohistorical data. Finally, I will discuss the complex demographic and cultural consequences of the Inkas' attempts to inhibit the movement of peoples from the tropical lowlands into the southeastern Andes, consequences that persisted well into the Spanish colonial era.

**Washburn, Eden (University of California Santa Cruz), Bebel Ibarra (Tulane University), Jason Nesbitt (Tulane University), Vicky Oelze (University of California, Santa Cruz) and Lars Fehren-Schmitz (University of California, Santa Cruz)**

[157]

*Strontium Isoscapes and Their Application in Andean Archaeology*

Strontium isotope ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) analysis of human skeletal remains is a relatively new and important method used in archaeology to examine past human mobility and landscape use. This study presents the results of a systematic survey of modern flora and fauna ( $n = 100$ ) from 14 locations to map the bioavailable  $^{87}\text{Sr}/^{86}\text{Sr}$  signatures of the Conchucos region of the north-central Andes, an area where the extent of geologic variability was previously unknown. Here, we illustrate the necessity to examine the variation in  $^{87}\text{Sr}/^{86}\text{Sr}$  values of the different geological formations available to human land use to document the range of possible local  $^{87}\text{Sr}/^{86}\text{Sr}$

values. In addition, our study raises questions around what may constitute isotope-based determinations of local and nonlocal populations in Andean archaeology. Within the Conchucos region we found significant variation in environmental  $^{87}\text{Sr}/^{86}\text{Sr}$  values (0.7078–0.7214). The resulting regionally specific isoscape represents one of the largest bioavailable  $^{87}\text{Sr}/^{86}\text{Sr}$  map (3,840 km<sup>2</sup>) to date for the Andes and will serve as a baseline for future archaeological studies of human mobility in this part of the Peruvian highlands. We also address potential challenges when applying  $^{87}\text{Sr}/^{86}\text{Sr}$  data in making determinations about past human mobility.

Washburn, Eden [41] see Huskey, Delphi

**Washington, Barbara**

[1]

*Discussant*

**Waterman, Anna (Mount Mercy University), Jess Beck (Harvard University), Colin Quinn (Hamilton College), Horia Ciugudean (Muzeul Național al Unirii Alba Iulia) and David Peate (University of Iowa)**

[71]

*Tracing Human and Animal Migration in Bronze Age Romania: A Preliminary Analysis Using  $^{87}\text{Sr}/^{86}\text{Sr}$  Ratios from Apuseni Mountains Sites in Southwestern Transylvania*

The Mureș River in southwestern Transylvania was an important waterway in the trading of numerous goods in prehistory. The nearby Apuseni Mountains are rich in natural resources, and settlements in the region would be expected to play an important role in regional trading systems. Analyses of  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios in dental enamel from prehistoric humans and animals can identify individuals who spent at least part of their childhoods in a location different from the burial environment. In this study human and faunal samples from Bronze Age sites in the Apuseni Mountains were analyzed for  $^{87}\text{Sr}/^{86}\text{Sr}$  isotope ratios in order to obtain information about human and animal mobility in the Late Prehistory of Romania. Based on the data gathered in this study, only two humans have been identified as possible migrants. No migrant animals were discovered. These data suggest human and animal migration was limited in this region during the Bronze Age despite nearby trade routes. However, further strontium isotope mapping and sampling across the region is needed to further clarify these results.

Waters, Christopher [166] see Brown, Matthew

**Waters, Michael (Texas A&M University) and Zachary Newell (Oregon State University)**

[116]

*Reconstruction of the 13,800-Year-Old Bone Projectile Point at the Manis Site, Washington*

Bone fragments embedded in a rib of the 13,800-year-old Manis Mastodon are shown to be the splintered remnants of the tip of a projectile point. We obtained new high-resolution micro-CT scans of the osseous fragments embedded in the rib and used open-source medical imaging software (3D Slicer) to “digitally excavate” the fragments from the surrounding bone tissue. We identified and created detailed digital models of 24 individual fragments, which were digitally refitted. Each fragment was also printed using a 3D printer and the individual pieces physically refit. This produced a projectile point tip with a plano-convex cross-section. With this and other data obtained in this study, we can reject alternative hypotheses for the origin of the bone fragments within the rib.

Waters, Michael [97] see Jennings, Thomas

Waters, Michael [213] see Keene, Joshua

**Watkins, Tia (University College London), Adam Jursky (Independent Researcher), Christophe Helmke (University of Copenhagen), Antonio Beardall (Texas State University / Institute of Archaeology) and Rosamund Fitzmaurice (University College London)**

[172]

*Digital Preservation of Classic Maya Graffiti through 3D Modeling: A Case Study from Xunantunich, Belize*

As one of the rarer forms of precolumbian art and writing, Classic Maya graffiti provides insight into the practice of personal commemoration and documentation. Current knowledge on the topic suggests graffiti were not commissioned works, but instead reflect ideas and memories unique to the artists' perspective. Often these works are etched onto the plastered surfaces of monumental buildings in elite contexts. During the 2017 and 2019 field seasons, the Xunantunich Archaeology and Conservation Project and the Belize Valley Archaeological Reconnaissance Project conducted excavations at Structure A13 in the Xunantunich site core, which revealed 24 graffiti depicting individuals of varying status, board games, a hieroglyphic date, and indeterminate images. As part of our efforts to preserve the graffiti, we use a combination of Blender and Unity software to reconstruct the terminal construction phase of Structure A13 and have superimposed the documented graffiti in situ. Our model incorporates information about each graffiti and associated contexts via interactive tools to engage the viewer and provides easily accessible data in an online format. Our modeling efforts not only preserve ephemeral and fragile images but also provide a forum for the local communities surrounding Xunantunich to access this important piece of cultural heritage.

**Watkins, Tia (University College London)**

[37]

*Discussant*

**Watson, Caroline (College of William and Mary) and Jennifer Kahn (College of William and Mary)****[160]***The Formation of Elite Ritual Inland Secondary Centers in the 'Opunohu Valley: A GIS Approach*

Ethnohistoric accounts of precontact Mā'ohi communities of the Society Islands speak to ritual activity and cosmological belief embedding people within physical landscapes and social practices like kinship, ancestral worship, and social hierarchy. As such, secondary chiefs residing in the interior 'Opunohu Valley utilized space and ritual architecture as vehicles of status negotiation, forging an elite identity over time. These practices resulted in the establishment of ritual-political secondary centers. We employ geospatial analyses to understand the organized formation of inland secondary centers and to connect these spaces with the materialization of ideology. Using GIS tools, we examine viewsheds, orientations, elevations, and aspects of marae (temples) in addition to conducting nearest neighbor analysis across five secondary centers. Our goal is to characterize the physical layout of ritual centers and examine whether topography affords visibility to certain ritually significant landscape features and structures, given Polynesian worldviews connoting sacredness to height and elevation. We showcase the results of these GIS analyses, comparing findings across the five secondary centers through site-specific and regional-specific scales. Contextualizing results within broader island-wide political and ideological transformations ultimately helps us characterize the inland 'Opunohu Valley secondary centers as areas of both tradition and innovation.

Watson, Caroline [159] see Gonzales, Mikayla

Watson, James [38] see Chen, Jennifer

**Watson, Jim (University of Arizona) and Randy Haas (University of California, Davis)****[26]***When Is a Cemetery? Recursive Forager Occupation, Mortuary Deposits, and Social Memory at Soro Mik'aya Patjxa, Lake Titicaca Basin, Peru*

Soro Mik'aya Patjxa (SMP) is a Middle/Late Archaic (8.0–6.5 ka) forager camp located in the western Titicaca Basin of Peru. Surface collections and excavations produced abundant lithic artifacts and 16 individuals from eight mortuary features. Multiple lines of evidence indicate that these individuals were relatively mobile but permanent residents of the highlands. Individuals buried at the site range in age from young children to old adults with a parity of males and females. At first glance, the density of burials would seem to suggest that SMP was a meaningful place to bury the deceased. However, the density of burials could also be a byproduct of recursive mobility practices for purely economic motivations. This begs the question: When is a cemetery? On the one hand, our calculations demonstrate that if a small group re-occupied SMP for a short time each year for 1,500 years, the number of deaths expected by chance is similar to the number of burials present. On the other hand, localized placement of burials within the site, the presence of two modes of body placement, positionally adjacent burials, and reuse of mortuary pits is suggestive of mortuary place making through social memory across ancestral ties.

**Watson, Jim (University of Arizona)****[26]***Chair*

Watson, Robert [182] see Christman, Carrie

**Watson, Sara (University of California, Davis), Tamara Dogandžić (Max Planck Institute for Evolutionary Anthropology) and Nicolas Zwyns (University of California, Davis)****[186]***Bladelet Production in Howiesons Poort: A View from Montagu Cave, South Africa*

The miniaturization of stone tools represents an important technological innovation in early human behavior, often linked with the manufacture of complex composite tools or weapons. However, the presence of small blanks within an assemblage is not surprising, given the nature of core reduction processes. Therefore, identifying deliberate choices guided by tool design or core exhaustion due to economic constraints is an essential step toward understanding the evolutionary meaning of stone tool miniaturization. In southern Africa, Howiesons Poort is one of the earliest technocomplexes where small blades and bladelets are systematically produced and retouched into formal tools. Although these are often interpreted as some of the earliest evidence for mechanically assisted projectiles, little is known about their production. Here, we examined a lithic assemblage from Montagu Cave, South Africa, and ask two main questions: Are small blanks produced independently from the large ones? And are there specific methods and techniques associated with the smaller lithic artifacts? We aim to evaluate the roles of raw material and decision-making in Howiesons Poort technology. Doing so provides insight into the emergence of tool forms that later reoccur in various places of the world and potentially mark a turning point in tool and weapon design.

**Watt, David (Tulane University), Mark Rees (University of Louisiana, Lafayette), Tad Britt (National Park Service), Kory Konsoer (Louisiana State University) and Jill Trepanier (Louisiana State University)****[127]***Interdisciplinary Research, Actionable Science, and Community Engagement: The Mississippi River Delta Archaeological Mitigation Project*

Native American archaeological sites on Louisiana's Gulf Coast are endangered and being destroyed by sea-level rise, coastal erosion, and climate change. These cultural resources are crucial sources of information and represent the unique heritage of coastal Louisiana. In partnership with the Chitimacha Tribe of Louisiana and working with tribal communities, a team of

archaeologists, climate scientists, geologists, and engineers from Louisiana State University, Tulane University, University of Louisiana at Lafayette, and the National Park Service are assessing climate change vulnerabilities and developing plans for the impending loss of these irreplaceable cultural resources. An interdisciplinary team of researchers comprise the Mississippi River Delta Archaeological Mitigation Project (MRDAM) and work with tribal and coastal communities in cultural resource management (CRM) planning and advise resource managers and stakeholders on where and how to direct limited resources. Our goals for actionable science and outreach are accomplished through consultations, workshops, reconnaissance, site monitoring, vulnerability assessment, and development of appropriate climate adaptation measures. For this talk we will share different ways in which MRDAM shares research findings and communicates with the public, including digital storymaps and social media.

Watts Malouchos, Elizabeth [15] see Benson, Erin

**Waudby, Denis (University of Bradford), Gillian Thompson (University of Bradford) and Adrian Evans (University of Bradford)**

[162]

*Blind Test Evaluation of the Reliability of Bast Fiber Microfibrillar Angle and Circularity as Diagnostic Features*

A range of plant fibers was used in prehistoric Europe for cordage, woven textiles, and string. The analysis of degraded archaeological specimens to determine which types were being used is often challenging, partly due to uncertainties around the reliability of identification techniques. Here, two established diagnostic approaches are standardized, quantified, and blind tested in terms of their combined ability to separate reference material from nettle (*Urtica dioica* L.), flax (*Linum usitatissimum* L.) and hemp (*Cannabis sativa* L.). These approaches are longitudinal microfibrillar angle (MFA) and cross-sectional circularity (Ct) used in a two-step procedure to analyze a set of randomly selected modern fibers ( $n = 48$ , 16 from each species). The overall success rate for identification was 66.7% but this varied between the species, and the results show differences in the efficacy of the methods. In the first stage, MFA distinguished between hemp and flax/nettle, with 81.3% of the hemp samples being successfully identified. Twenty-seven samples proceeded to stage 2 and were classified using Ct analysis after which 66.7% of all flax, and 50% of all nettle samples were identified successfully. This suggests that some evidence for the use of wild nettles may have been underrepresented in archaeological reports.

**Wayman, Joseph (Independent Researcher)**

[76]

*Large Cutting Tools (LCTs) Were Not Hand Tools: Experiments Support the Hypothesis that LCTs Were Used in Traps to Injure Prey Animals*

That the Large Cutting Tools (LCTs) of the Pleistocene were created in their great numbers to serve as foot and leg damaging devices placed in traps by early humans was proposed in "Foot Cutters: A New Hypothesis for the Function of Acheulean Bifaces," *Lithic Technology*, Fall 2010, Joseph Wayman. Experiments show how they may have functioned and support the ideas in Wayman 2010. That similar to the historically known caltrop, the device would be moved around by animal footsteps and often come to rest with a sharp edge placed so as to make further footsteps dangerous.

**Weaver, Brendan (Stanford University)**

[60]

*Mermaids, Umbrellas, and Goats: Afro-Andean Worlds and the Sacristy Lintel of San Joseph de la Nasca (Peru)*

The aesthetic experience of the human body in contact with the material world is often contested and the generative site of politics. For the large population of enslaved Africans and Afro-descendants of the Jesuit vineyard haciendas of Nasca, Peru's Ingenio Valley, colonial tensions and contradictions manifested in sensory encounters with everyday objects, the built environment, and even works of art. This heterogeneity of experiences occurred in both public and restricted spaces, as demonstrated by archaeological research at the seventeenth and eighteenth-century Jesuit haciendas San Joseph de la Nasca and San Francisco Xavier de la Nasca. This paper explores one such restricted space: the gold-painted adornment of the sacristy lintel of San Joseph's late Andean-Baroque chapel, completed in 1744. The lintel features 15 panels running from its scalloped edge, adorned with figures, scenes, and floral and geometric decorations in shell gold paint. Through a detailed analysis of the lintel painting, I interrogate how diverse sensory experiences contributed to the ever-changing aesthetico-political regime at the haciendas, and simultaneously resonated with a broader African diaspora

Weaver, Eric [202] see McCrackan, Jennifer

Weber, Andrzej [198] see Schulting, Rick

Weber, Gerhard [191] see May, Hila

**Weber, Sadie (Universidade de São Paulo) and Matthew Sayre (High Point University)**

[151]

*Follow the Llamero: The Movement of Plant Foodstuffs in the Andes*

[WITHDRAWN]

Weber, Sadie [189] see Cusicanqui, Solsiré

Weber Scharff, Marion [78] see Rodriguez Osorio, Daniel

**Webster, Laurie (University of Arizona)**

[5]

*Wetherill's Long-Lost Keet Seel Collection from Northeastern Arizona: Archival Clues, Misidentifications, and a Remarkable Perishables Assemblage*

In 1897, as leader of the Whitmore-Bowles Expedition, Richard Wetherill mapped and excavated a large 120-room cliff dwelling in Laguna Creek, near Monument Valley in northeastern Arizona, after completing his fieldwork in Grand Gulch, Utah. Soon after, the expedition's collection was acquired by the American Museum of Natural History in New York as part of its Hyde collection. When curator Nels Nelson cataloged the collection decades later, he initially identified the large Laguna Creek cliff dwelling by its modern name, Keet Seel, but changed his identification to the Utah site of Poncho House after consultation with Southwestern archaeologist Earl Morris. For nearly a century, this Poncho House identification has persisted in the museum's records, while the location of Wetherill's 1897 Keet Seel collection has remained unknown. In this paper, I present archival and geographical clues that reidentify this large cliff dwelling as Keet Seel and then offer a brief glimpse of this large, well-provenienced, late thirteenth-century collection, with its rich assemblage of baskets, textiles, and wooden implements focused on cotton processing, spinning, and weaving.

**Webster, Rebecca**

[143]

*Indigenous Community Formation along the Potomac River Valley*

In recent years, Chesapeake archaeologists have placed more emphasis on the unique cultural landscape of the Potomac River Valley, including studies on subregional British community formation. However, one area that has been undertheorized in the subregion is Indigenous community formation during the colonial period. In this paper, we compare attributes associated with Indigenous-manufactured tobacco pipes from the Coan Hall (44NB11), Boathouse Pond (44NB111), Posey (18CH281), Zekiah Fort (18CH808), and Heater's Island (18FR72) sites in order to identify possible communities of practice throughout the Potomac River Valley. Identifying these communities of practice may highlight evidence of coalescence of Indigenous populations thought to have disappeared. Identifying instances of coalescence has the potential to assist archaeologists in understanding Eastern Algonquian persistence during and after the colonial period.

**Wedemeyer, Rachael (University of California, Riverside) and Kenichiro Tsukamoto (University of California, Riverside)**

[110]

*Preliminary Investigations of the López Plaza, a Small Plazuela Compound in El Palmar's Main Group*

This paper focuses on El Palmar, a Classic period (250–900CE) site located in the Southern Maya Lowlands. How did individuals interact within the multiple spaces of El Palmar's Main Group? The site's Main Group is configured by several large public plazas, monumental structures, and over 44 carved monuments containing epigraphic and iconographic data. The Main Group of El Palmar served as the civic-core during the Classic period. The López Plaza is a small plaza compound (plazuela) toward the southern perimeter of El Palmar's Main Group. The Gúzman Group is an area in the Main Group's northern periphery. How did the built environment of the López Plaza facilitate interactions between individuals, specifically within different areas of the Main Group? And, how does the spatial configuration of the López Plaza compare to other areas of the Main Group? Investigations in this paper will engage in spatial analyses and draw heavily from lidar data, preliminary archaeological surveys, and published literature concerning El Palmar's Main Group. Considering the topography and built environment of the site, the separation between the Lopez Plaza and other areas of the Main Group likely did not foster intensive interactions.

Wegmann, Karl [64] see Holcomb, Justin

**Weiner, Robert (University of Colorado Boulder), Richard Friedman (San Juan College) and John Stein**

[152]

*Monumental Roads of the Chaco World: New Fieldwork and Insights*

This talk reports on recent fieldwork at various locations throughout the Chaco World, with emphasis on the use and meaning of monumental roads at outlier Great Houses. Our documentation of Chacoan ritual landscapes, which combines lidar, SfM photogrammetry, GPS mapping, and phenomenological observation, reveals a distinctive suite of small-scale architectural features associated with roads. We present a taxonomy of these features—including “boxes,” “gates,” and “road rooms”—and suggest they offer key insight into human-level practices that, in turn, inform the role of roads within the greater Chacoan polity. We also present new findings regarding the “destinations” of select Chacoan roads previously unassociated with an endpoint. Some sites to be discussed, which span the Basketmaker III to Pueblo III periods, include Chambers, Dittert, Gasco Herradura, Holmes Group, Kin Nizhoni, Llave de la Mano, Navajo Springs, Reservoir Site, and Skunk Springs. One of the major findings of this work is that monumental roads, often considered a hallmark of the Bonito Phase, are well attested before and (especially) after the height of Chaco Canyon, thus problematizing the notion of “Chacoan” roads, which may in fact be one of the longest-lived expressions of monumentality, power, religion, and regional identity in the ancient Four Corners.

**Weir, Donald (Commonwealth Heritage Group)****[219]***Commonwealth Associates, Gilbert/Commonwealth, Commonwealth Cultural Resources Group, and Commonwealth Heritage Group*

Forty-four years of doing cultural resources management (CRM) work. Fourteen years working for a large private corporation and 30 years as the owner of my own firm with 10 offices in eight states. This paper will discuss the early years (1974–1988) when my work consisted of providing CRM support for large projects being developed through the NEPA process and later years (1988–2018) working primary with the Section 106/110 process. The profession of CRM has come a full circle in those years. The early work was done as part of a large teams represented by many disciplines, the middle years were mostly working on archaeology with little impute from other professionals, in the later years we realized that archaeology worked best by including a wide range of other professionals. It is important to understand that archaeology is one of many resources to be considered in project development. In addition, I will discuss my experience with expansion through acquisitions, and my experience with ownership transition to my son Andrew J. Weir, RPA.

**Weismantel, Mary (Northwestern University)****[55]***The Moche "huacos retratos": "Portraits" from the Indigenous Americas*

In stark contrast to most human effigies from the ancient Americas, the Moche ceramics known as "portrait pots" ("*huacos retratos*") appear to fulfill every criterion for portraiture. The faces are lifelike, the expressions are animated, and they seem to celebrate both individuality (through the variation in facial features from one pot to another) and shared membership in a wealthy elite (through carefully rendered details of clothing and adornment). But to use the word "portrait" implicitly makes us compare these Indigenous works of art to the long tradition of portraiture in the West. Instead, in this paper I explore aspects of the *huacos* that are obscured by the term "*retrato*" by explicitly comparing them to other works of Moche ceramic art. This comparison that leads me in two directions: toward the equally stunning portrayals of nonhuman persons, especially predatory birds such as owls and hawks; and toward the *huacos* as *huacos*—that is, as ceramic vessels that hold vital fluids and transmit them between bodies. From this perspective, crucial differences from European portraits of great men start to emerge, revealing Indigenous concepts of power and beauty that are more animist than anthropocentric, and more ancestral than individualistic.

**Weiss-Krejci, Estella (Austrian Academy of Sciences, Vienna)****[53]***Layered Temporalities: Tikal's Problematical Deposits and the Ancient Disturbance of Maya Graves*

The ancient Maya frequently disturbed the graves of their forebears. This behavior has been linked to the presence of certain types of ritual deposits called 'problematical deposits,' a term coined by members of the University of Pennsylvania Tikal Project. Problematical deposits are usually characterized by broken grave goods and stone monuments that originate from more than one time period, as well as commingled and incomplete human bones that occasionally show signs of burning and breakage. In honor of Marshall J. Becker's contributions to Maya archaeology and his work on the meaning of ritual deposits, this presentation will discuss the relationship between disturbed tombs and ritual deposits at Tikal. The spatial arrangements of problematical deposits, their material composition and their multi-temporality provide important clues as to why the ancient Maya reentered and cleared out older tombs.

Weiyu, Ran [54] see Shaw-Müller, Kyle

**Welch, John (Simon Fraser University)****[215]***Are Spaces between Places Also Places? Ancient Trails, Regional Interconnectivity, Negative Data, and Experiential Landscape Archaeology in the Arizona Transition Zone***[WITHDRAWN]****Welker, Martin (Arizona State Museum) and Amanda Semanko (Independent Scholar)****[68]***Constructing a Baseline: Dogs in the American Southwest*

In 1970 Harold S. Colton published what remains one of the seminal studies of archaeological dog remains in the American Southwest using linear morphometric data on 198 specimens. Unfortunately, these data were never published. We apply updated methods to a dataset including Colton's data transcribed from his original note cards, supplemental data from published sources, and data collected on specimens in the Arizona State Museum collections. In doing so, we reevaluate Colton's findings and construct a regional and temporal baseline on dog size and proportions in the Southwest. Our data suggest Colton is correct in identifying at least two dog populations in the Southwest, and attributing the larger dogs with later, Pueblo period occupations. However, when examining Colton's small dog type our data suggest a regional size gradient, with the smallest dogs persisting very late in time in the Four Corners region, when larger dogs appear to the south.

Wellings, Amber [161] see Jones, Eric

**Wells, Joshua (Indiana University South Bend), Mackenzie Edmonds (Indiana University South Bend), Eric Kansa (Open Context), Sarah Kansa (Alexandria Archive Institute) and David Anderson (University of Tennessee, Knoxville)**

[72]

*The Past, Present, and Future of the Archaeological Site Number: Analysis of Site Number Publication Patterns and Suggested Best Practices to Turn Identifiers into Linked Open Data and Revolutionize Archaeology for the Informatics Age*

Smithsonian Trinomial style site numbers which now dominate American archaeological site numbering strategies have been in use for almost a century. This poster presents the results from examination of tens of thousands of published Smithsonian Trinomial site numbers, text mined from the primary archaeological and anthropological literature in JSTOR, and incorporated into the Digital Index of North American Archaeology (DINAA) Linking Sites and Literature (LSL) project. The authors discuss trends in semantic variability of the trinomial format and geographic distribution of trinomial publication in various journals. The effects of incorporating these trinomials into the DINAA-LSL serves to illustrate emergent ways in which trinomials (and other site numbers) can serve as unique identifiers in a linked open data strategy across the Internet. Such use of trinomials and other site numbers with defined standards for identification demonstrates their important organizational potential for building archaeological informatics bridges between primary research, cultural resource management, curational facilities, archives, literature, and governmental reporting, to interoperate digital archaeology. Suggested ways in which DINAA-LSL practices can be easily incorporated into a wide variety of archaeological records keeping and publication strategies to make them interoperable will be presented.

**Wells, Joshua (Indiana University South Bend)**

[36]

*Discussant*

[72]

*Chair*

Wells, Joshua [72] see Edmonds, Mackenzie

**Wells, Sarah**

[138]

*Invisible Mothers: The Often-Overlooked Mother-Infant Nexus in Bioarchaeology*

Maternal mortality and the mother-infant relationship have been researched very little in the field of bioarchaeology. This paper aims to highlight and understand this lack of research, why it exists, and the ways in which it can be done effectively by analyzing the existing literature in both the mother-infant relationship and childhood bioarchaeology. The reasons for the gap in research include the relative rarity of mother-infant burials, motherhood still being viewed as only a “women’s issue,” and the fact that many of the theories and methodologies employed in this research have only been developed in the last 20 years. The theories and methodologies beneficial to this research are archaeoethnology, the mother-infant nexus, and the Developmental Origins of Health and Disease (DOHaD) hypothesis. All of these things encourage considerations beyond just the visible material and data from an archaeological site, and therefore are also beneficial to addressing the other issue discussed in this paper, which is an overall lack of interpretive thinking and discussion of implications in bioarchaeological literature.

**Wells, Sarah**

[138]

*Chair*

Welte, Caroline [70] see Rowe, Marvin

**Wenger, Sarah (University of Miami), Paul Wojtal (Rosenstiel School of Marine and Atmospheric Sciences), Kim Popenдорф (Rosenstiel School of Marine and Atmospheric Sciences), Hilary Close (Rosenstiel School of Marine and Atmospheric Sciences) and William Pestle (University of Miami)**

[89]

*Snuffs to Reach the Spirit Realm: A Forensic Analysis of Ancient Hallucinogenic Snuffs from the Middle Period of the Southern Andes*

The use of mind-altering substances to achieve an altered state of consciousness (ASC) is both demonstrably ancient and geographically widespread. Due, at least in part, to the broad availability of flora containing mind-altering secondary metabolites in the New World biota, the pursuit of ASC was deeply ingrained in the social and religious systems of many southern Andean societies. Indeed, among the Middle period (ca. AD 400–1000) societies of the southern Andes, hallucinogenic snuffs appear to have formed a central part of the social, religious, and political fabric and such snuffs, and their associated paraphernalia, appear with some frequency in mortuary assemblages of the period. The present research concerns 12 hallucinogenic snuff samples from Middle period sites in Chile and Peru, preserved due to the exceptional conditions of the region, which were analyzed by both GC- and LC-MS techniques in order to identify hallucinogenic compounds present and, if possible, discern the “recipes” used in their preparation. The results of these analyses provide heretofore unavailable quantitative insights into the processes of snuff preparation, regional, diachronic, and site-level variations in regard to the practice, and anthropological insight into the societal import of the role(s) that such hallucinogens played.

**Wernecke, D. Clark (Gault School of Archaeological Research), Alan Slade (Texas Archeological Research Laboratory) and Jennifer Gandy (Texas Archeological Research Laboratory)****[116]***Clovis in Kentucky: The Little River Clovis Complex*

In 2019, the Texas Archeological Research Laboratory (TARL) at the University of Texas at Austin was loaned a unique archaeological collection of great importance and potential significance for the understanding of the early peopling of Kentucky, the southeast region of North America, and for the Upper Paleolithic of the Americas. The collection came from an avocational archaeologist, Carl Yahnig, from his home neighborhood in Christian County, southwest Kentucky. Yahnig collected from a series of Clovis-age sites in the 1950s, starting with the Adams site (15CH90). Six main localities make up the Little River Clovis Complex, following the course of the Little River, a tributary of the Cumberland River, through Christian County. What makes Yahnig's collection so unique and important is that the sites are single component Clovis source camp / manufacturing sites, with a toolstone element made up of about 95% local St. Genevieve chert, known locally as Hopkinsville chert. The other toolstone present is Payne and Dover chert and a few pieces of unnamed chert. A complete production sequence from nodule, primary flaking, early stage preform, through to late stage fluted points was recovered by Yahnig.

**Werness-Rude, Maline (Ventura College)****[59]***The Chocholá Style: Expanding the Corpus*

As Late Classic northern Maya luxury goods, Chocholá style ceramics reflected and conferred status on their owners. Their deep carving, nuanced iconography, and distinctive dedicatory formulae projected a clear vision of quality and identity. Artists who developed and worked within the style made consistent formatting and shape choices that helped create a unique visual set. This group of vessels functioned sociopolitically in public and private spaces of northern exchange. The core style seems to have been oft mimicked, with outliers appearing frequently in the material record. Now, just over a decade after the publication of an updated corpus, additional examples and outliers can be included. These pieces add greater nuance to our understanding of Late Classic elite messaging, interaction spheres, and likely locations of pottery manufacture. While the works under consideration are often identified as Chocholá in brief publications, they have not been explored fully in the context of the larger style, its artistic integrity, physical dissemination, or the deposition of individual objects. Doing so will also broaden our understanding of artistic dialogue, variability, and agency within the Maya patronage structure.

**Wernke, Steven (Vanderbilt University) and Parker VanValkenburgh (Brown University)****[9]***GeoPACHA: An Online Platform for Collaborative Imagery-based Survey in the Andes*

Systematic visual survey of high resolution satellite imagery and historical aerial imagery has been proven to provide a large-scale, complementary perspective to archaeological feature and site distributions from field-based methods. Projects such as the CORONA Atlas and GlobalXplorer have completed large surveys to document endangered heritage and enable interregional scale analysis of site distributions. GeoPACHA builds on these approaches by enabling a "federated" approach to problem-oriented survey projects. Through GeoPACHA, research teams can pursue problem-specific research questions through imagery survey, while the platform permits inter-project analytical integration through a common data schema. Peer review is integral to the platform, as survey coverage and locus identifications can be reviewed by regional and general editors before data are committed to a canonical database. In this introductory talk, we present an overview of the platform architecture and its functionality, contrasting it to other existing large-scale satellite survey platforms and discussing the ethics of virtual survey.

**Wernke, Steven (Vanderbilt University)****[9]***Chair*

Wernke, Steven [9] see Kohut, Lauren

Wernke, Steven [87] see Tung, Tiffany

Wernke, Steven [9] see VanValkenburgh, Parker

Wernke, Steven [9] see Zimmer-Dauphinee, James

**Wescott, Konnie (Argonne National Laboratory), Kendra Kennedy (Argonne National Laboratory), Mark Grippo (Argonne National Laboratory), William Pringle (Argonne National Laboratory) and Peregrine Gerard-Little (Argonne National Laboratory)****[24]***Paleoenvironmental Research, Climate Modeling, and Coastal Archaeological Sites Monitoring at Tyndall AFB, Bay County, Florida*

In December 2017, Tyndall Air Force Base (AFB) engaged with Argonne National Laboratory (Argonne) to assist in the management of coastal archaeological sites within the installation. Less than a year later, Hurricane Michael directly struck Tyndall AFB and the Florida Panhandle as a Category 5 hurricane with 161 mph winds and 14 ft. storm surge. Driven by the vulnerability of coastal resources as demonstrated by Hurricane Michael, Argonne is using state-of-the-art, interdisciplinary methods to develop a holistic archaeological monitoring plan. A coastal risk analysis component uses cutting-edge atmospheric sciences and climate research being conducted at Argonne to model the local effects of sea-level rise, flooding, and storm events out to the year 2095. A paleoenvironmental study component uses archival maps, geomorphology data, and existing paleoenvironmental reconstruction studies to build a sensitivity model for both identified and potential offshore and coastal archaeological sites. The resulting monitoring plan guides multimodal monitoring methods like on-the-ground monitoring and comparative analysis of lidar data and aerial imagery to monitor potential impacts on the more than 230 known coastal archaeological sites that are increasingly vulnerable to natural processes and anthropogenic activity. By looking to the future, Argonne is helping Tyndall AFB to protect its past.

**Wescott, Konnie (Argonne National Laboratory)****[24]**

Chair

Wescott, Konnie [24] see Collins, Lori

Wescott, Konnie [24] see Duke, Daron

**Wesolowski, Veronica (Museum of Archaeology and Ethnology—University of São Paulo)****[26]***Entwined for Eternity: Insights about Remembrance and Shell Mound Builders' Communities through Funerary Practices*

Since the 1990s, Brazilian coastal shell mounds, known as Sambaquis, are understood to have resulted from intentional, transgenerational, community construction, and in many cases were express a symbolic dimension associated with funerals. Shell mound builders were sedentary fisher-gatherers who organized themselves in communities around lagoons and bays, explored environments rich in varied resources, and occasionally experimented with the production of staple vegetables, mainly tubers. This presentation synthesizes insights that articulate observations made in Sambaquis located in the State of Santa Catarina, to explore the funerary practices of these peoples. Several case studies demonstrate that the maintenance of memory of the dead and distinctive treatment given to children and young people suggests the existence of a continuum between the world of the living and the world of the dead. In this sense, funerary Sambaquis, built over generations by the deposition of the bodies of the dead, memorialize the ancestors into the coastal landscape, building significant places, at the same time supporting social relations existing between the living, between the dead, and between the living and the dead.

**Wesp, Julie (North Carolina State University), Melanie Miller (University of Otago, New Zealand), Daniela Trujillo Hassan (Centro de Estudios Históricos del Ejército), Lucero Aristizabal Losada (Fundación GÜE QUYNE) and Felipe Gaitán Ammann (Universidad de los Andes)****[193]***Heavenly Meals and Humble Hearts: An Isotopic Approach to Jesuit Foodways in Spanish Colonial New Granada and Early Republican Colombia*

Foodways are deeply entangled in our identities and can be particularly salient in religious practices, making food an ideal material for examining religiosity in the past. We explore how bone isotopic data ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ), in combination with analyses of dental pathology, dental calculus, and archival research, can illustrate relationships between food and social identities including status, and the norms of religious life in colonial New Granada. This research analyzes skeletal remains from the San Ignacio Jesuit church, an outstanding colonial landmark in Bogotá, Colombia that has served as a space of sacred burial for 400 years. Through our multidisciplinary approach, the intersections of age, sex, social status, and membership in religious society demonstrates how certain individuals mobilized food as symbols of opulence and wealth, while others consumed more meat in their diets despite notions of piety and vows of poverty. Similarly, there are varying levels of diversity in the plants being consumed, including the presence of some species that were brought to the city from more tropical and lowland areas. In the early Republican period, we see a shift in food choices and the adoption of new oral hygiene practices as methods of embodying new cultural notions of modernity.

Wesp, Julie [69] see Rosenberg, Ciele

**Westmont, V. Camille (University of the South)****[204]***The Power in the Landscape: Using Remote Sensing to Identify Features of Control within the Lone Rock Convict Stockade Landscape*

The Lone Rock Stockade (40GY78), located in Grundy County, Tennessee, was a ca. 1872 private prison used by the Tennessee Coal and Iron Company to house convict laborers leased from the state. At the Lone Rock Stockade, prisoners were forced to work—sometimes to death—on the company's coal and iron ventures for over two decades. While the stockade itself served as a prison structure, archival documents indicate that the landscape around the stockade was also used to control and oppress the imprisoned population. Using lidar and thermal imaging, archaeologists from the University of the South aim to locate the auxiliary carceral structures within the industrial landscape in order to reveal how imprisoned and forced labor were not just achieved through threats of violence and intimidation, but were built into the fabric of the landscape itself.

**Weyrich, Laura (Pennsylvania State University, University of Adelaide), Andrew Farrer (University of Adelaide), Abigail Gancz (Pennsylvania State University) and Keith Dobney (University of Sydney)****[111]***Biological, Pathological, and Temporal Drivers of the Oral Microbiome Composition in Ancient British Populations*

Previous ancient DNA examinations of ancient dental calculus revealed apparent major changes in oral microbiota (e.g., Neolithic and Industrial Revolutions) but did not incorporate geographic differences or technical biases. This is critical, as key findings that illuminate the evolution of human diet and health may be masked by these biases. Here, we conduct the largest ancient dental calculus study to date with 235 ancient oral microbiomes spanning 8,000 years in Great Britain. We control for geography by including 127 incredibly well provenanced individuals from London and control for known technical biases (e.g., oral geography). We identified two distinct oral microbial communities that were widespread across Great Britain until at least 1895, after which only one appears to have become dominant. Analysis of microbial functions also suggest that these differential oral communities may reflect past differences in diet—specifically differential access or utilization of dairy and dietary carbohydrates. London oral microbiomes were also linked to the presence of chronic, inflammatory diseases and the arrival of the Black Death, suggesting that past

pandemics may have shaped modern health. This study reveals the power of paleomicrobiome studies to identify unpredictable factors that shape human health today and illuminate chronic disease origins.

Weyrich, Laura [111] see Gancz, Abigail  
Weyrich, Laura [111] see Wright, Sterling

**Whalen, Michael (University of Tulsa)**  
**[14]**

*Supra-local Symbols, Cultural Evolution, and the Case of Paquimé, Chihuahua, Mexico*

There are several instances in Latin American prehistory of the spread of supra-local or “world” symbols, in what have been termed “interaction spheres,” followed by their abrupt demise. One such is the Olmec of Early Formative Mesoamerica, while another parallel case involved the Chavín of Early Horizon Peru. Characteristic of both was the emergence of long-distance trade in exotica and, especially, in supernatural symbols. These symbols diffused widely for centuries, although there is no indication that they had the same meanings everywhere. They vanish abruptly by the Middle Formative (Olmec) and the Initial period (Chavín). It is argued that incipient leaders in both areas required exotica and foreign symbols to cement their authority. Once such positions are established and local power bases are built, interregional interaction and the attendant supra-local symbols assumed other forms. It is suggested that something similar began among emerging leaders at Paquimé, where we see substantial trade in exotica and supernatural symbols. We see no cessation of this pattern because cultural development there never reached the levels of the Middle Formative or of the Initial period.

**Wheelbarger, Linda (San Juan College), Carol Lorenz (San Juan College) and David Preston (San Juan College)**  
**[144]**

*Discovery of a Basketmaker III Pithouse Occupation at the Point Great House Community in Northwestern New Mexico*

The Point Great House Community is located along the San Juan River near Farmington, New Mexico. San Juan College field school excavations from 2006 to the present have revealed a Chacoan Great Kiva, Great House complex with multistory rooms built of local style masonry, two small Mesa Verde Pueblo III houses, and two Mesa Verde kivas. The site is situated in a dramatic setting and would have represented an important regional center. Testing of a large depression at the site began in 2014 but was discontinued until 2019 at which time a small segment of burned wall representing the northwestern edge of an approximate 6 m diameter pit structure was discovered. The structure was filled with trash and analysis of ceramics demonstrated a predominance of late Pueblo I and early Pueblo II materials. In 2021, the trench was expanded another meter to allow excavation of a 2 × 2 m area of the structure. A Chapin Gray jar and Piedra B/W bowl were associated with a mealing bin on the floor. Wall construction indicates upright posts at the structure perimeter. A carbonized sandal fragment has been verified to represent one typical of the Basketmaker III time period. Additional analyses are being conducted.

Wheelbarger, Linda [144] see Rospopo, Steven

**Wheeler, Joseph, Madeleine McLeester (Dartmouth College) and Mark Schurr (University of Notre Dame)**  
**[164]**

*Beyond the Bunkers: Investigations of a Protohistoric Village at the Former Joliet Arsenal*

The protohistoric period in the Chicago region is defined by the Native American circulation of European-origin goods prior to direct European contact. This time period is essential to understanding the later colonial era as well as how agricultural communities navigated the especially cold temperatures of the Little Ice Age. Yet the widespread destruction of sites in the Chicago Region combined with the long occupation of many village sites, has resulted in a regional archaeological record that is fragmentary and/or chronologically difficult to untangle. This presentation provides findings from five years of remote-sensing and excavations at a uniquely well preserved, single-component protohistoric agricultural village, Middle Grant Creek, dating to the first quarter of the seventeenth century and located on the former Joliet Arsenal grounds. Results demonstrate a large, vibrant agricultural community who maintained widespread trade networks and rich ritual lives. Early findings at MGC are refining understandings of this critical era in the Chicago Region while simultaneously raising key questions about agriculture, village dynamics, and ritual practices.

Wheeler, Sandra [24] see Duncan, Neil

Whess, Kwun [155] see MacDonald, Brandi

Whitcher Kansa, Sarah [72] see Edmonds, Mackenzie  
Whitcher Kansa, Sarah [72] see Wells, Joshua

**White, Andrew**  
**[97]**

*Agate Basin in the Eastern Woodlands*

The recognized distribution of Agate Basin points (ca. 12,600–10,700 cal YBP) extends from the Rocky Mountains to parts of the Atlantic coast. These points are most closely associated with bison hunting on the Great Plains. Their presence deep into the Eastern Woodlands remains unexplained. This paper compiles published data on the distribution of Agate Basin points east of the Mississippi River and frames those data in archaeological and environmental contexts. A rapid demographic expansion from the

Plains into largely unoccupied swathes of the east around 11,900–11,700 cal YBP (i.e., after Clovis but prior to late Dalton) is proposed as a plausible scenario to account for the presence of Agate Basin points between the Great Lakes and the Ohio River.

**White, Andrew**

[97]

Chair

**White, Carolyn (University of Nevada Reno)**

[205]

*The Ruins of False Promises: Land Reform, Abandonment, and Heritage in Southern Italy*

The ruins created by an Italian land reform project are the focus of this paper. After World War II, the Italian government launched a program to place land in the hands of impoverished families in southern Italy. Nearly 70 years later, what was a spectacular disaster for the people and a bonanza for the state has left its physical evidence scattered across the countryside of Puglia and Basilicata in the form of dozens upon dozens of abandoned farmhouses in machine-cultivated fields. In 2017, I began an interdisciplinary project with photographer Steven Seidenberg to document the buildings, material culture, and landscapes and the contemporary reuse of the spaces by modern migrants. Our ongoing project aims to develop interdisciplinary methods to document these settlements, to investigate potential relationships among archaeology, heritage studies, contemporary art-making, and public awareness, and to better understand the development and displacement of precarious communities in the twentieth and twenty-first centuries.

**White, John (Center for the Study of the First Americans), Ted Goebel (Texas A&M University) and Michael Loso (Wrangell-Saint Elias National Park and Preserve)**

[113]

*Around the Basin and Beyond: GIS-based Least Cost Path Analysis Reveals Conveyance Patterns of Obsidian Sourced from the Copper River Watershed*

When traced to known sources, the distribution of volcanic lithic materials has informed studies of specific conveyance patterns. The Walker Road site in the Nenana valley of central Alaska has yielded tools manufactured on obsidian sourced to Wiki Peak, located in northern Wrangell-St. Elias National Park, and the as-yet unidentified A' (or Ringling) source which is presumed to be somewhere in the Copper River drainage. Yet the recently identified NAB-00533 site in the northern Copper River basin contains solely Wiki Peak obsidian. The presence of these southern Alaskan obsidians at Walker Road suggests either long-distance seasonal procurement or established trade networks connecting the Nenana valley to the uppermost Tanana River basin and possibly the Copper River basin. Though the lowest level of NAB-00533 has yet to yield obsidian, its occupation is contemporaneous with that of Walker Road. We use GIS-based least-cost-path analysis to identify the most probable route or routes used by Paleoindian peoples to transport obsidian to these sites. We use the Ringling site as a proxy for the location of the A' source and incorporate geologic estimates of Glacial Lake Ahtna's terminal Pleistocene shorelines as well as regional ice coverage in the Wrangell Mountains and Alaska Range.

**Whitehead, Megan**

[172]

*Artifact Density Analysis in Tlajinga*

This study compares artifact densities in Tlajinga, a neighborhood in the southern part of Teotihuacan, an ancient city in central Mexico. This study focuses on two apartment compounds: one occupied by obsidian workers and one without an obvious occupation, both of which were used as primary living spaces. Using artifact analysis and GIS (geographic information systems) mapping, this study aims to find a difference between the two apartment compounds, as well as similarities between the two compounds. This study compares the following artifact types: obsidian, shell, slate, greenstone, mica, basalt, adobe, seeds, ceramics, and animal bones. This study divides the number of artifacts recovered by the amount of material excavated, as an estimation of the density of artifacts across the two compounds. This study asks questions about the socioeconomic status of the people in this district, whether it changed across the district, and about artifact differences between public and private spaces, different occupation, and different social status. By examining artifact density using GIS, this study seeks to learn more about craft specialization and differences between public and private life in Teotihuacan.

**Whitley, David (ASM Affiliates Inc.)**

[146]

*Puberty Initiation and Rock Art in South-Central California*

The creation of pictographs during puberty initiations is very well documented in the southern California ethnographic record but whether this practice occurred in south-central California has been unclear. Some Yokuts evidence associated paintings with puberty rites but whether this was anecdotal or part of a wider practice was unknown. Recently identified ethnographic data combined with archaeological information indicate that puberty rites either produced pictographs or were conducted at rock art sites among the Yokuts, Chumash, Kawaiisu and Salinan, demonstrating that it was a widespread regional pattern. Unfortunately there is no clear stylistic signature that distinguishes initiatory from other kinds of rock art unlike in southern California, making its identification difficult. Still this evidence emphasizes the multiple uses of rock art ethnographically.

**Whitlock, Bethany (Brown University), Natali López Aldave (Universidad Nacional Mayor de San Marcos), Sophie Blumenstein (Brown University) and Makoto Kobayashi (Brown University)**

[9]

*Pastoralist Networks in the South-Central Andes during the Spanish Colonial Period*

Historians have long recognized the importance of Latin American colonial mining in the development of global economies. However, narratives of early modern development have tended to marginalize the central role long-established Andean pastoralist networks played in both the export of mined materials and the broader provisioning of often-remote mining centers. Here, I use remote sensing, modeling, and archival data to examine how pastoralist communities negotiated their involvement in these incipient global networks, with a particular focus on the logistics of Spanish colonial period trade and transport routes centered on the mining town of Huancavelica, in the south-central Peruvian highlands. Intensified caravan demand, coupled with declining camelid populations due to European-introduced epidemics and the arrival of European animals, likely resulted in shifts in environmental and herd management strategies. Combining archival analysis with digital survey data provides an opportunity to compare colonial policy with its on-the-ground effects, thus contextualizing practices within their environmental setting and suggesting how Andean caravanners managed Spanish demands on their time and herds.

Whitman-Moore, Stacey [162] see Bies, Michael

**Whitney, Kristina (US Army Corps of Engineers), Ed Hooker (National Cemetery Administration), Kirsten Hebert (US Army Corps of Engineers) and Andrea Gregory (US Army Corps of Engineers)**

[81]

*A New Push for the MCX: Historic Preservation with the National Cemetery Administration*

Following the spirit of Dr. Trimble's push for new ideas and management of cultural resources, USACE is working with the National Cemetery Administration under the Department of Veterans Affairs on a long-term historic preservation project focusing on superintendent's lodges listed on the NRHP located in numerous national cemeteries. Typical of federal infrastructure, these lodges were all erected prior to 1950 and are in need of repair and rehabilitation meeting SOI Standards. The project is complex for several reasons: the lodges are located across the country, are different architectural styles, have different periods and themes of significance, and have distinct but often overlapping needs for treatment. These are a unique and particular resource for our national cemeteries; each building is a record of the changes in cemetery administration and planning that have occurred since the Civil War. The Mandatory Center of Expertise for the Curation and Management of Archaeological Collections is excited to take on this logistically complex project due to its unique nature and the ongoing need and concern for managing federally owned historic properties. This paper will examine the Center's first steps into historic preservation management and examine several examples of the superintendent's lodges managed by the NCA.

Whittaker, John [187] see Berman, Mary Jane

**Whittemore, Anna (Cornell University), Tiffany Tung (Vanderbilt University), BrieAnna Langlie (Binghamton University), Elizabeth Arkush (University of Pittsburgh) and Matthew Velasco (Cornell University)**

[82]

*Growing Up with Warfare: Childhood Diet and Mobility at a Hillfort in the Lake Titicaca Basin (1275–1500 CE)*

Endemic warfare became a feature of life on the Andean Altiplano during the Late Intermediate period, following the disintegration of the powerful Tiwanaku polity and the onset of a severe, centuries-long drought. In the Lake Titicaca Basin, communities organized themselves into fortified hilltop settlements, which may have contributed to other changes in food production and consumption. This study addresses such food practices and social dynamics at Ayawiri, one of the largest of these hillforts, from the perspective of its youngest inhabitants, using stable isotope analysis of 27 dental enamel apatite samples from 25 individuals. The  $\delta^{13}\text{C}$  values (mean:  $-12.7\text{‰}$ ) reveal that they consumed a uniform diet dominated by  $\text{C}_3$  plants, such as the potatoes and quinoa grown on hillside agricultural terraces. The  $\delta^{18}\text{O}$  results indicate that all of the individuals sampled were raised in the region surrounding Ayawiri. Moreover, indicators of social differentiation, such as cranial modification, nonlocal burial goods, or burial location, are not associated with distinctive stable isotope values. These data, contextualized with other paleopathological and paleoethnobotanical data, present a picture of locally oriented childhoods within a corporate community, where children had access to similar weaning foods and were buffered from nutritional stress, despite living under precarious conditions.

Whitten, Ashley [173] see Mink, Philip

**Whittington, Stephen (National Mining Hall of Fame & Museum) and Soren Frykholm (University of Michigan)**

[220]

*Spatial Analysis of Chiyo Cahnu (Teozacoalco), Oaxaca*

Chiyo Cahnu, a precontact Mixtec mountaintop capital, is depicted within the body of the famous Mapa de Teozacoalco, a document painted by a Mixtec artist around 1580. GPS mapping of the core of the site between 2013 and 2017 produced data on structure size and density, as well as surface distribution of artifacts. New analyses based on these data are presented, which reveal (1) locations of statistically significant concentrations of various artifact types and room sizes, (2) viewsheds of the site and its surrounding territory, and (3) access routes to and within the site. These analyses help to pinpoint functional and status differences between areas of the site.

**Wholey, Heather (West Chester University), Joanna Maurer (West Chester University), Daria Nikitina (West Chester University) and Megan Heckert (West Chester University)****[127]**

*Connecting the Dots: An Interactive Approach to Building Climate Heritage Narratives along the Delaware Bay's Scenic Byways*  
Archaeology and cultural heritage have the inherent ability to engage people's imagination and curiosity. Yet outside of disciplinary research and cultural heritage management, there is limited awareness of the finite nature of these resources and the threats they face from climate change. Cultural resources along Delaware Bay's Scenic Heritage Byways hold the stories of thousands of years of connections between the communities, cultures, and resources of the largest preserved coastal marshes along the East Atlantic coast. Rising seas, flooding, and the effects from tropical cyclones jeopardizes some of the natural and cultural resources that local communities rely on economically and to build a sense of identity. A cross-disciplinary approach allows those working on the problem, and those we wish to communicate with to connect the dots and make the linkages between cultural and socioeconomic resources. We use StoryMaps to illustrate probabilistic future sea levels based on the IPCC RCP scenarios, foregrounding the impacts to cultural resources as broadly accessible and engaging narratives. At the same time, the StoryMap may allow users to visualize cultural resources as part of a total package along with other regional and community resources within the surrounding built environment.

**Wholey, Heather (West Chester University)****[127]***Chair*

Wibberly, Alaina [107] see Smith, Nicole

**Wichlacz, Caitlin (Arizona State University), Morgen Schreiner (Arizona State University), Brendan Hurla (Arizona State University), Dwight Courtney (Arizona State University) and Iris Staley (Arizona State University)****[173]**

*Reconstructing Relationships: Digitizing and Examining Data from Las Colinas Mound 8 Features and Ceramics*  
Despite the importance of the site of Las Colinas to regional research on Hohokam archaeology, published feature and artifact data remain incomplete and there is a serious disconnect between the published data and archival datasets. Generating useful, up-to-date datasets is therefore essential to making the most of the research potential of the extensive collections and archives generated through work at the site. To address the challenges presented by the gaps in these datasets, we digitized the feature and ceramic data from the Mound 8 (platform mound) area of Las Colinas. Working between published maps and digitized feature location data, we are able to partially construct a concordance of feature names and numbers for the Mound 8 area, creating a crucial link between the published and archival datasets. Linking feature locations to digitized ceramic tabulations allows examination of spatial patterning in ceramics across the Mound area. The digitized archival ceramics data offer more detail than those published in excavation reports, and have been updated to reflect recent typological reanalyses. By digitizing, linking, and revising these sources of information, this work has created newly usable datasets that will facilitate current and future research and allow clearer interpretations of published records.

**Wienhold, Michelle (Applied EarthWorks Inc.), Eric Nocerino (Applied EarthWorks Inc.), Douglas Harro (Paleo Analytics LLC) and Clayton Lebow (Applied EarthWorks Inc.)****[24]**

*Archaeological Data Recovery Excavations at CA SBA 695 on Vandenberg Space Force Base, Santa Barbara County, California*  
Archaeological site CA SBA 695 lies on the Pacific coast in the northern sector of Vandenberg Space Force Base (Vandenberg SFB), about 0.90 miles (1.46 km) south of Purisima Point. The data recovery excavations presented here were completed by Applied EarthWorks Inc. under subcontract with Argonne National Laboratory, to support compliance with Section 110 of the National Historic Preservation Act (as amended). The purpose of this work was to recover data from an archaeological feature that otherwise would be lost to erosion. A 1 × 1 m excavation unit centered on the feature was used to assess whether the feature was a chert heat-treatment oven. Upon analysis, the structure of the feature does not fit the expectations of a heat-treatment oven. Additional excavation and analysis at the site found that other activities such as lithic raw material procurement may have taken place. Although both the excavated volume and the recovered assemblage were relatively small, sufficient data were recovered to address important research issues related to prehistoric subsistence and land-use patterns, lithic technology, and chronology.

Wienhold, Michelle [24] see Nocerino, Eric

**Wiewel, Adam****[137]***Discussant*

Wigley, Sarah [114] see Mauldin, Raymond

**Wigodner, Alena (University of Arizona)****[138]***Presence or Participation? Gendering Small Finds in Religious Contexts*

At sanctuaries or pilgrimage sites, some objects are ritually offered to a deity while others are simply lost. We can assume purpose-made ex-votos were offered rather than lost, but how often was the same true for everyday items including coins, jewelry, and tools? This question is critical when studying gendered participation in ritual in the Roman world, where the most clearly gendered offerings, plaques and statues inscribed with the offerer's name, were made mostly by men. A survey of finds from sanctuaries in Roman Britain confirms that gendered purpose-made ex-votos were more often offered by men. However, when everyday items are included, the proportion clearly favors women. This indicates that failure to recognize everyday items as offerings rather than losses risks significantly underrepresenting women as participants in ritual. While lost items speak to women's presence at sanctuaries, offered items provide evidence of women's active participation in ritual. I study small finds at the Uley sanctuary in Gloucestershire, UK, which includes clear offering contexts (a temple) as well as structures supporting sanctuary activity (including a hostel and kitchen). Women's items are found across these contexts, and the distribution of items provides insight into gendered participation in ritual at the sanctuary.

**Wiktorowicz, Conner, Brian Shaw (Argonne National Laboratory), Anya Kitterman (Hill Air Force Base), Daniels O'Rourke (Argonne National Laboratory) and Andy Orr (Argonne National Laboratory)****[24]***The Historic Military Archaeological Landscape of the Utah Test and Training Range*

The Utah Test and Training Range (UTTR) is a 1,712,000-acre US Air Force facility used to test and evaluate new weapons systems as well as for air-to-air combat and air-to-ground attack training. Since Native communities settled the land more than 13,000 years ago, it has seen complex anthropogenic changes across its undulating sand dunes, mountains that rise abruptly from the desert floor, and rolling hills that build up to mountain ranges. Hill Air Force Base manages UTTR and hundreds of precontact and historical sites, but the historic military sites represent some of the most understudied landscape modifications. Using documentary research, aerial imagery, and lidar data, Argonne National Laboratory is conducting a landscape study, from World War II through the Cold War era, focusing on identifying individual target sites and contextualizing their use through a military archaeology lens. In World War II, the site was home to Wendover Field, which trained thousands of heavy bomber crewmembers critical to the Allied war effort. Afterward, the base continued to provide critical testing and training. This research supports target site evaluation for National Register eligibility, identifies potential adverse impacts, and recommends management strategies for the cultural resources of this Great Salt Lake Desert landscape.

**Wiktorowicz, Conner****[24]***Chair*

Wiktorowicz, Conner [24] see Gerard-Little, Peregrine

**Wilcox, Daniel (Kent State University) and Michelle Bebbler (Kent State University)****[4]***Understanding the Shift from Soapstone to Pottery in Eastern North America during the Late Archaic and Early Woodland Period: An Experimental Approach*

This research examines the decline of soapstone vessels and the adoption of pottery for cooking at the end of the Late Archaic (5000 BP to 3000 BP) into the Early Woodland period (3000–2000 BP). The reasons for this change in cooking technology have been debated by scholars. Several hypotheses have been put forward which consider factors such as change in diet, vessel characteristics, and vessel production. However, very few experimental studies have assessed the physical processes involved in the production and use of soapstone bowls compared to early clay vessels. Here, to better understand this change in cooking technology and generate comparative data, an archaeological experiment was conducted which involved the replication of vessels made from soapstone and natural clay. Thermal properties, including heat retention, transfer, and thermal shock resistance, were examined by heating the two vessel types over an open fire in a cooking experiment. This study provides insight regarding the replacement of soapstone vessels with those made of clay during the Early Woodland period and provides new information regarding the costs and benefits for each technology.

Wilcox, Michael [66] see Lippert, Dorothy

**Wilcox, Timothy (Stanford University)****[41]***Large-Scale Ceramic Analysis: The Social Lives of Bricks at Stanford University*

Bricks were an often overlooked archaeological material but more and more historic archaeologists have developed research methods to investigate this common and widespread material. Many years of historic period excavations at Stanford University have uncovered many brick deposits, some in situ and some in dumps following the 1906 San Francisco earthquake. Various historic home foundations, cellars, bridges, and waterworks dot the Stanford landscape. A man-made lake and a men's gymnasium swim tank were filled with bricks and debris from 1906. There is even a brick kiln site. Most recently a large dump of bricks was uncovered during the Arboretum Chinese Labor Quarters project. Scaling up ceramic analysis methods I will use the communities of practice framework to interpret brick data and perhaps glean some interpretations about nineteenth-century California communities surrounding the commencement of Stanford University.

Wilde, James [81] see Williams, Amy

Wilk, Elizabeth [140] see Katz, Steven

Wilk, Richard [188] see Pyburn, K Anne

**Wilkes, Margaret (NPS Northeast Region Archeology Program)**

**[137]**

*Discussant*

**Wilkie, Laurie (University of California Berkeley)**

**[100]**

*Moderator*

**Wilkin, Shevan (Institute of Evolutionary Medicine), Alicia Ventresca Miller (University of Michigan), Erdene Myagmar (National University of Mongolia) and Nicole Boivin (Max Planck Institute for the Science of Human History)**

**[99]**

*Complexities of Subsistence and Economy in the Mongol Empire*

In the popular press the Mongol Empire is often portrayed as a large horde of hostile raiders with subsistence strategies focused on pastoralism and grain extortion, lacking complex economic structures. Recent biomolecular studies have helped to better expand our knowledge of subsistence across Mongolia during the tenure of the empire. Recently, stable isotope analysis and ancient protein research has provided new insights into dietary practices in the empire. In tandem with established archaeological and historic data, we explore the diversity of pastoral animals used for dairy resources, as well as the range of millet use across the empire.

**Wilkinson, Darryl (Dartmouth College)**

**[124]**

*A Contested Quarter: The Historiography of Antisuyu*

The Inkas called their empire “the four parts made whole.” Of those four parts, Antisuyu is in many ways the least clearly understood. We can see this in the remarkably divergent accounts of Antisuyu that have emerged within Andeanist scholarship over the past half-century. Even the geographical boundaries of Antisuyu vary enormously, depending on whose work you read. Why exactly does Antisuyu seem harder to pin down than the other three parts? This paper will begin by exploring the lack of consensus around where Antisuyu was; and go on to argue that this emerges from an insufficient understanding of what Antisuyu was. Specifically, I will discuss three distinct manifestations of Antisuyu: metropolitan, heartland, and imperial. Whereas the first two were quite precisely defined based on ritual movements across the landscape, the third was an idea more than a place. As such, “imperial Antisuyu” was, from the Inka perspective, only vaguely located in space. I will conclude with the idea that Antisuyu primarily represented a geopolitical relationship with certain Upper Amazonian groups—mostly Arawak speakers—rather than a province, or region.

**Williams, Amy and James Wilde (US Air Force Civil Engineer Center, Retired)**

**[81]**

*Collaborating on Contingency Operations: A Reconnaissance Archaeological Survey of Air Base 201 in Niger*

In 2017, the US Air Force Civil Engineer Center (AFCEC) requested archaeological assistance from the US Army Corps of Engineers' Mandatory Center of Expertise (MCX) for the Curation and Management of Archaeological Collections (CMAC) to support a project in Niger, Africa. This collaboration led to a survey of over 1,200 acres of Airbase 201 (AB 201) near Agadez, where culturally sensitive materials had been identified. This paper focuses on the successful collaboration between AFCEC and MCX CMAC, which resulted in an update to AB 201's cultural resources management plan, the modification of training and visual aids for airmen on AB 201, and the recovery of several Acheulean hand axes and the recordation of burials for avoidance.

**Williams, Charlotte**

**[167]**

*Tools of the Trade: Capitalism and Industry in Twentieth-Century Central American Archaeological Practice*

In the twentieth century, archaeologists working in Central America used neighboring American-controlled industries to facilitate their excavations. From the appropriation of tools and trades of fruit growers, mahogany lumberman, and chicle extractors, archaeologists exploited local knowledge, techniques, and in some cases capitalist labor orders to extract and interpret the archaeological record. For instance, tasked with moving Maya stelae, archaeologists in the 1930s relied on the United Fruit Company's shipping monopoly, while simultaneously utilizing the labor of extracting the stones as a way to conduct a pseudo-controlled experiment meant to test how the stelae were originally erected. At the site of Piedras Negras, Guatemala, archaeologists speculated that Maya groups in the past moved stelae using the same fibrous ropes and techniques as did the contemporary Maya mahogany men moving lumber close to site, a conclusion that meshed essentialized notions of Maya knowledge with capitalist logics of efficiency. Using original archive research of the Penn Museum's Sitio Conte and Piedras Negras expedition collections,

this paper analyzes how the physical infrastructure of capitalist systems and the performance of labor greatly conditioned how archaeology was produced, recorded, and made public in ways that require greater theoretical intervention.

Williams, John [116] see Perrotti, Angelina

**Williams, Justin**

[83]

*Digitizing the HRI: A Tribute to the Work of William Andrefsky Jr.*

In 2006, William Andrefsky Jr. proposed a method to evaluate the retouch present on hafted bifaces. The hafted biface retouch index (HRI) measures the degree to which, the blade of a hafted biface has been retouched. The HRI does this through an examination of flake scars found along the margins of the blade of a bifacial tool. Though originally proposed as a method for the analysis of physical artifacts, this paper provides a methodology through which this analysis can be done on images of bifaces. In many instances, the analysis of digital images has been found to be equally accurate and more convenient than analyzing physical artifacts. ImageJ and even simple software like PowerPoint can be utilized to calculate the hafted biface retouch index on digital images of hafted bifaces. To test the validity of the digital method of calculating HRI, it is tested on a sample of 100 Clovis hafted bifaces from across Western North America. The index score is then compared between sites, between site types, and between culture areas.

Williams, Mark [12] see Jefferies, Richard

**Williams, Patrick Ryan (Field Museum), David Reid (University of Illinois at Chicago) and M. Elizabeth Grávalos (Field Museum)**

[129]

*Wari Influence across the Andes: Reviewing the Radiocarbon Evidence*

The expansion and influence the Wari polity has held across the Andes has been heavily debated by scholars over the past two decades. We use radiocarbon dates, Bayesian statistics, and contextual data from several Andean regions to review the chronology for Wari expansion, political reorganization, and impact on local settlements. We recognize that Wari political and economic influence will vary in space and time and present a model that addresses how influential moments (expansion, reorganization, collapse) in Wari's trajectory may or may not have had broader impacts across the landscape of its peer polities. Our model, while not completely comprehensive, draws on both Wari's presence in the north highlands and in the south, where scholars have argued for distinct trajectories and character of Wari influence. It also examines data from local communities in these same regions contemporary with Wari identified settlements, but perhaps without outward indicators of Wari hegemony, to evaluate broader patterns in Middle Horizon settlement through the latter half of the first millennium CE.

**Williams, Patrick Ryan (Field Museum)**

[9]

*Discussant*

[87]

*Chair*

Williams, Patrick Ryan [87] see Guengerich, Anna

Willis, Anna [26] see Muir, Brianna

Willis, Mark [153] see Harrison-Buck, Eleanor

**Wilson, Evan (New York Consortium of Evolutionary Primatology), Peter Lanzarone (University of Georgia), Brady Kelsey (University of Connecticut), Elisabeth Hildebrand (Stony Brook University) and Steven Brandt (University of Florida)**

[90]

*Making the Cut: Combining Photogrammetry and GPR to Model a Late Pleistocene Paleosurface at Mochena Borago, Southwestern Ethiopia*

Mochena Borago Rockshelter (MB) in southwestern Ethiopia preserves a discontinuous record of human occupation from Late Pleistocene (>50 ka) to present times. Three decades of MB research have revealed complex, localized stratigraphies indicating diverse natural and anthropogenic site formation processes. Excavations in MB's central sector have uncovered a highly indurated volcanic layer (INV) that is laterally extensive with unknown thickness. INV has been cut/scoured along 9 linear m, creating a cavity (>80 m<sup>2</sup>, >2 m depth) where Late Pleistocene deposits accumulated in western parts of the shelter. East of the cut, INV has an unconformable paleosurface bearing evidence of human activity (grinding/pounding holes and other intentional modifications). Reconstructing MB formation processes depends on determining the extent of INV's paleosurface, and the shape and dimensions of the cut. Here we offer a photogrammetric 3D representation of INV's top surface and vertically cut/scoured walls visible in excavation units. Integrating this with recently published ground-penetrating radar (GPR) data, we model INV surfaces, and shape/depth of the cut, in unexcavated areas. This model serves as the foundation for future research concerning the nature of MB site formation and artifact distribution through space and time.

Wilson, Evan [90] see Kelsey, Brady

Wilson, Gregory [15] see Ferree, Tyler  
 Wilson, Gregory [8] see Friberg, Christina  
 Wilson, Gregory [8] see Noe, Sarah

**Wilson, Jeremy (Indiana University-Purdue University, Indianapolis), David Pompeani (Kansas State University) and Broxton Bird (Indiana University-Purdue University, Indianapolis)**  
 [15]

*The Muddy Waters of Horseshoe Lake: Understanding the Environmental and Climatological Context of the Mississippian Occupation at Cahokia*

In parallel to recent archaeological research on Cahokia and related settlements in the American Bottom, there has been a renewed interest in Horseshoe Lake's sediment with the goal of obtaining proxy measures of flooding, environmental, and climate variability, as well as anthropogenically related inputs and erosion. Here, we review our recently published research on sediment cores obtained in 2012 and 2013, while highlighting our ongoing work related to Mississippian land-use and pollution. The sedimentological and geochemical data from Horseshoe Lake track population growth and land-use patterns during the Stirling and early Moorehead phases, including a distinct fine-grained layer with higher  $^{15}\text{N}$  in organic matter, elevated sorbed metals (e.g., Pb), and decreased  $^{13}\text{C}$  in carbonates indicative of intensified human activity within the watershed. Meanwhile, our oxygen isotope record demonstrates that the ratio of precipitation to evaporation for Horseshoe Lake was high and indicative of wet conditions from AD ~1100–1200 and subsequently decreased during the Moorehead and Sand Prairie phases (AD ~1200–1350) when Mississippian populations reorganized and eventually depopulated the American Bottom. These results demonstrate that the American midcontinent is susceptible to severe drought and that past hydroclimate change likely contributed to demographic instability by undermining agricultural productivity.

Wilson, John [126] see Langlie, BrieAnna

**Wilson, Kurt (University of Utah), Brian Coddling (University of Utah), Weston McCool (University of California Santa Barbara), Daniel Contreras (University of Florida) and Joan Brenner Coltrain (University of Utah)**  
 [47]

*Climate Change Drives 7,000 Years of Dietary Variation in the Central Andes*

Explaining the factors that influence past dietary variation is critically important for understanding changes in subsistence, health, and status in past societies; yet systematic studies comparing possible driving factors remain scarce. Here we compile a large dataset of past diet derived from stable isotope  $\delta^{13}\text{C}\text{‰}$  and  $\delta^{15}\text{N}\text{‰}$  values in the Americas to quantitatively evaluate the impact of 7,000 years of climatic and demographic change on dietary variation in the Central Andes. Specifically, we couple paleoclimatic data from a general circulation model with estimates of relative past population density inferred from archaeologically derived radiocarbon-dates to assess their influence on dietary variation using an ensemble machine learning model capable of accounting for interactions among predictors. Results reveal that Central Andean diets across elevational contexts converge over time, culminating in near-complete homogenization under the Inca Empire. While this convergence appears in conjunction with changing sociopolitical conditions, the pattern quantitatively correlates more strongly with local climatic conditions than population size, indicating that the past 7,000 years of dietary variation was driven by climatic more than socio-demographic change. This finding and approach establishes a general framework for understanding the influence of climate on dietary change across human history.

**Wilson, Kurt (University of Utah)**

[47]

Chair

Wilson, Kurt [47] see McCool, Weston

**Windle, Morgan (ROOTS Cluster of Excellence, Kiel University)**

[214]

Chair

**Wingfield, Laura (School of Art and Design, Kennesaw State University)**

[82]

*Subtle and Not-So-Subtle Resistance by the Guaimí of Western Panama: The Case of the Church of San Francisco de la Montaña*

In today's western and central Panama an abstract aesthetic in volcanic stone, ceramic, gold, and wood was developed by indigenous Chibchans to express their distinct and highly sophisticated culture, yet their lifeways were challenged by the Spanish invasion beginning in the sixteenth century. Here, the Guaimí, as they are known today, resisted Spanish missionary and military overlords through subtle and not-so-subtle ways. Specifically, in the "Indian town" of San Francisco de la Montaña, established by Spanish friars in the 1600s, a letter from a Guaimí chief to Catholic authorities boldly protested friars' treatment. More covertly, the decoration within the Guaimí-built church hints at the resistance of these indigenes to succumb to the entirety of Catholic control. The altar ostensibly refers to Christian theology but subversively to Chibchan beliefs, while the 14 columnar supports reference 14 Guaimí guards who protected Panama at the enforcement of the Spanish governor. Through analysis of Chibchan art past to present as well as the beliefs of colonial through contemporary Chibchans, as recorded in ethnohistoric and ethnographic documents, a vision of the persistence of the ancient ways of the Guaimí emerges.

**Wise, Karen**

[217]

*Discussant*

**Witt, David (NYS Department of Environmental Conservation)**

[95]

*A Quick Characterization of Lithic Materials with Ultraviolet Light: An Attempt to Accurately Determine the Presence of Narbona Pass Chert*

This poster presents the results of a quasi-quantitative characterization of chert materials obtained from sites and sources within the Middle San Juan Region, New Mexico, United States. The project's goal is to develop a field methodology for differentiating Narbona Pass chert—a stone associated with the Chacoan polity—from other cherts. The stone is commonly described as an almost transparent orange to pink stone with occasional white banding; this orange-pink color is considered diagnostic. However, other colors such as yellow, pale blue, dark gray, and red are known. Additionally, high-quality orange and pink cherts are also known from other local sources such as Ojo Alamo gravels. This may lead to some materials being incorrectly categorized as Narbona Pass, and some Narbona Pass material being misnamed. However, the pink colors within Narbona Pass materials fluoresce bright green under shortwave ultraviolet light. This green fluorescence is likely due to the presence of uranium compounds, which are a discriminating factor between Narbona Pass chert and other materials. The presence of these uranium compounds and the resultant ultraviolet fluorescence phenomena is investigated to determine its potential utility as a quick and inexpensive method to characterize Narbona Pass chert in field and laboratory settings.

**Witt, David (NYS Department of Environmental Conservation)**

[7]

*Moderator*

[211]

*Discussant*

Witt, Kelsey [68] see Thomas, Ariane

**Witte, Emilee, Donna Nash (University of North Carolina at Greensboro) and Emily Schach (University of California Santa Cruz)**

[162]

*People, Pigments, and Parallels*

The Late Intermediate period is viewed as a time of collapse, when the Wari and Tiwanaku polities fragmented and new cultural traditions emerged. In this poster I use portable X-ray fluorescence (pXRF) to examine changes from the Middle Horizon to Late Intermediate period in the availability and use of slip pigments and colorants. Pigments are essential to polychrome pottery production seen in the various cultural traditions studied. The knowledge of production was transferred between communities. The spread of ideas followed social networks and led to the development of new communities of practice. I will describe changes and continuities in the use of pigments in the Moquegua Region and discuss the implications these results have for understanding the transmission of craft knowledge and the scope of exchange networks from the Middle Horizon to Late Intermediate period.

**Woehlke, Stefan (University of Maryland College Park)**

[204]

*The Seen and Unseen: The Dynamic Visualscape of African Americans in Slavery and Freedom*

Visibility is a key factor in the structure of plantation landscapes in the United States of America. The position of African American people in the rural visualscape shifted over time, with the most dramatic changes occurring at the transition from legal enslavement to the post-emancipation period. The calculation of total viewshed maps at multiple ranges enables an interpretation of the ways in which the enslaved and freed community in the western portion of Orange County, Virginia, negotiated surveillance, community solidarity, social status, and aesthetics in slavery and freedom.

**Woehlke, Stefan (University of Maryland College Park)**

[204]

*Chair*

Wojtal, Paul [89] see Wenger, Sarah

**Woldekiros, Helina (Washington University in Saint Louis)**

[6]

*Discussant*

**Wolf, Marc (GC CUNY)****[130]***Architectural Embodiments of Identity and Order*

Shallowly viewed as a stage from which anthropological characters enact their particular cultural lifeways or as an active participant that is simultaneously shaped by and exerts influence on society, architectural assemblages (isolated buildings as well as amalgamated clusters, and significantly, walls, ports, drainages, reservoirs, quarries, caves, bridges, roads/paths, etc.) give crucial framework for iconographic studies, linguistic approaches, lithic and ceramic analyses, exchange/trade analysis, geomorphological studies, zoo- and bioarchaeological investigations, migration studies, social structure modeling to name a few—arguably every discipline within our science. Architecture is perhaps the most obvious marker of social inequality, highlighting to all—past inhabitants and transients to modern audiences—social status and organization. This paper discusses ancient Maya architecture in the Central American lowlands of Guatemala, Mexico, and Belize considering several differing but related means of creating and re-enforcing human identity. Archaeology has increasingly posed questions regarding the human processes of survivance, embodiment, and practice theory, giving a more nuanced view of the forging, assertion, and preservation of cultural and individual identity than is often detailed in many traditional theories couched in rigid dichotomies. The architecture and exchange networks of Maya archaeological sites provide a robust arena in which to investigate and illustrate these behaviors.

Wolfe, Cody [66] see Bledsoe, Jacob

Wolfe, Lydia [110] see Roldan, Jonathan

**Wolff, Christopher (University at Albany)****[216]***Is Maritime Archaic an Archaic Term? A Consideration of Terminology in Newfoundland and Labrador*

The Archaic period of Newfoundland and Labrador is vaguely defined. It shares aspects with the Paleoindian period elsewhere because the “Maritime Archaic” peoples of the region were the first to colonize it (ca. 8000 BP) following the melting of the ice sheets. It differs in that it does not fit the historical Paleoindian timeframe and because the Maritime Archaic developed a coastal economy and technology unlike the terrestrial assemblages associated with traditional views of Paleoindians. However, characteristics that define the Archaic period elsewhere, such as broader subsistence strategies, territoriality, and greater sedentism, are rare in the early Archaic period of the region. Moreover, near the end of the Archaic period, there are no changes from a highly mobile, hunter-gatherer society that traditionally defines Woodland periods elsewhere. There are some shifts to a more generalized economy, larger residential groups, and more reliance on terrestrial fauna, but those traits elsewhere define “Archaic” periods instead of distinguishing them from later periods. With this in mind, this paper will ask if the term “Archaic” in Newfoundland and Labrador is useful? Is it just a chronological marker or something more important, and does it fit with traditional ideas of what it means to be “Archaic?”

**Wolff, Christopher (University at Albany)****[216]***Chair*

Wolff, Christopher [28] see Holly, Donald

**Wolfhagen, Jesse (Purdue University)****[40]***Examining “Young Male Culling” with Bayesian Multilevel Mixture Models*

The “Young Male Culling” model of early domestic animal herd management describes early herders as slaughtering excess males before they reached sexual maturity to maintain larger herds of adult females. Importantly for zooarchaeologists, this management system should produce distinctive patterns in the age and sex structure of the zooarchaeological assemblages, consisting of large-sized unfused specimens and smaller-sized fused specimens, particularly for elements with later-fusing epiphyseal ends (Zeder and Hesse 2000). While this pattern has been explored using log-standard index (LSI) values from archaeological sites to identify general biometric patterns, supplemented with mixture modeling (e.g., Arbuckle and Atici 2013), multilevel modeling of LSI values addresses biometric variation across different elements that can obscure patterns (Wolfhagen 2020). This poster combines multilevel LSI modeling with mixture modeling to estimate the age and sex structure of 10 zooarchaeological assemblages of measured sheep (*Ovis aries*) remains from Neolithic sites in Anatolia. By using the parametric results of the biometric model to estimate the age and sex of unmeasured specimens, sex-specific age profiles can be constructed for different age stages. Comparisons of these sex-specific age profiles provide a framework to evaluate the probability that these assemblages suggest the presence of “young male culling” in Neolithic Anatolia.

**Wolfhagen, Jesse (Purdue University)****[40]***Chair*

**Wolforth, Thomas****[56]***A Context to Assist in Determining the Eligibility Status of Foxholes on Military Installations*

The soldier's foxhole is no stranger to the military bases that many archaeologists contend with. If you have stumbled into one or more in your work, you may have struggled in your pursuit to determine whether they are eligible for listing on the National Register. A context for evaluating foxholes on National Guard lands in Alaska is presented here. The context identifies the data required to create reproducible and independent evaluations including information on morphology, landscape, chronology, typology, and social connotations. Two themes guide the evaluation for the Alaska Guard context. Context themes and chronologies can be modified to fit other installations.

**Womack, Andrew (Furman University)****[150]***Connecting Pots to Potters in the Qijia Period in Northwest China*

Recent excavations at the Majiayao type-site in Gansu Province, China have revealed extensive occupational layers dating to both the Majiayao and subsequent Qijia periods. Petrographic analysis was undertaken on two types of sherds from a Qijia period context, revealing two distinct paste groups, both comprised of locally available raw materials but not exactly matching the two sherd types. This paper will focus on how to interpret these remains: are the different paste recipes a result of different intended functions of the vessels or do they instead reflect different communities of practice operating simultaneously at the site or at separate sites? Comparison with other sites in the region as well as other ethnographic and archaeological studies are used to hypothesize about the range of possibilities, with discussion centering on the challenges of identifying and interpreting communities of practice in a fragmented archaeological record.

**Womack, Andrew (Furman University)****[150]***Chair***Wong, Gillian (University of Tübingen), Britt Starkovich (University of Tübingen) and Nicholas Conard (University of Tübingen)****[85]***How Local Are Those Paleoenvironmental Reconstructions? A Taphonomic Analysis of the Microfaunal Remains from Langmahdhalde, a Magdalenian Site in Southwest Germany*

The Late Glacial period (~18–11.6 k cal yr BP) is a time of dynamic European climates, as the glaciers of the Last Glacial Maximum retreat northward and forests take their place. During this time of transition, Magdalenian people recolonize Central Europe, making local paleoenvironmental reconstructions necessary to understand human behavior during this time. Our work with the faunal remains from Langmahdhalde, a Magdalenian site in the Lone Valley of the Swabian Jura (southwest Germany), provides a new understanding of Late Glacial environments. We argue that the area was tundra, with pockets of denser vegetation, during this time, and was likely more productive and taxonomically diverse than modern tundra. But how local are these paleoenvironmental reconstructions? We conducted a taphonomic study of the microfaunal remains from the site to answer this question. We find that several species of owl, such as the Eurasian eagle-owl (*Bubo bubo*), tawny owl (*Strix aluco*), and great gray owl (*Strix nebulosa*), likely deposited the microfaunal assemblage. These species all have hunting ranges within 70 km<sup>2</sup>, suggesting that our paleoenvironmental reconstructions apply to the Lone Valley and its surroundings. We use these results to discuss Magdalenian recolonization of the region.

**Wong, Gillian (University of Tübingen)****[85]***Chair***Woo, Katherine (James Cook University)****[154]***Tracking Mangrove Forest Evolution in the East Alligator River Region Using Molluscan Remains*

Mangroves, or mangal forests, are highly productive and dynamic ecosystems that can, and have, provided humans and their fossil ancestors with a plethora of resources. Despite their high productivity, and evident importance to humans in the past, there has been relatively little attention paid to them by archaeologists. This is particularly the case in Northern Australia where, despite copious evidence that shows these environments dominated the landscapes of the region throughout the Holocene, there remains a paucity of information regarding how humans interacted with, and responded to, changes in mangal forests. This talk will discuss how molluscan remains from archaeological sites can be used to examine these human interactions with mangal forests, and to develop rich pictures of localized variation in forest structure.

Wood, Sunny [56] see Esdale, Julie

Wood, Warren [46] see Damour, Melanie

**Woodfill, Brent (Winthrop University)****[153]***Empowering Professionals, Students, and Communities: Alphawood's Impact at Salinas de los Nueve Cerros, Guatemala*

For the entire 12-year trajectory of Proyecto Salinas de los Nueve Cerros, the Alphawood Foundation has been a constant funding source, which has allowed for an unprecedented level of experimentation, flexibility, and security for students, upcoming scholars, and local community members alike. This presentation focuses on the key insights that have resulted from this project, specifically how to ensure that each of the primary shareholders of our research are able to work together to meet each of their needs—publications, dissertations, sustainable income, clean water, and myriad other skills, products, and resources.

**Woodhead, Genevieve (University of New Mexico) and Asia Alsgaard (University of New Mexico)****[190]***Helping Hands and Hands-On Learning*

The University of New Mexico laboratory course for the Introduction to Archaeological Method and Theory aims to give undergraduate students hands-on experience with lab and field techniques prior to attending field school. Transitioning to remote learning impacted our ability to meet course objectives. However, through collaboration and assignment restructuring, we provided a hybrid class experience that allowed for hands-on learning, even at a distance. We set two main goals: (1) make the transition as smooth as possible and (2) teach students observational and argument development skills through kinesthetic learning and hands-on experiences. To meet these two goals, we implemented three strategies. First, we delegated tasks and shared labor. Secondly, to offset the computer-heavy 2020–2021 academic year course load, we created and distributed “lab kits” (i.e., ceramics, lithics, and owl pellets) and offered two in-person, outdoor lessons. Finally, we targeted our instruction style to emphasize observation and the formation of logically valid arguments. With this focus, students, including non-anthropology majors, could gain widely transferrable skills. In this talk, we outline what did and did not work with our two-goal, three-strategy approach including the rate of lab kit returns and the accuracy and reproducibility of data collected by students working remotely.

**Woodson, Kyle (Gila River Indian Community)****[126]***Finding and Understanding Ancient Hohokam Irrigated Agricultural Fields in Southern Arizona*

For over a century, archaeologists have investigated the vast network of prehistoric Hohokam canal irrigation systems in the lower Salt River and middle Gila River valleys, as well as in other areas of southern Arizona. However, documentation of the agricultural fields in which prehistoric farmers irrigated their crops generally was lacking until the last 25 years. This is largely a result of the difficulty in identifying ancient fields, since they are not visible on the surface and have been obscured or destroyed by natural landscape processes as well as historic and modern disturbances. More recent archaeological investigations have revealed ancient Hohokam irrigated fields through innovative methods and excavation techniques that have exposed the faint traces of these fields. These discoveries occurred during projects conducted in compliance with the National Historic Preservation Act, enacted in 1966. In this presentation I will highlight these important studies that have expanded our view of ancient agricultural landscapes in southern Arizona.

**Woolfolk, Paige (Saint Xavier University) and Rosalba Yasmin Cifuentes Argüello (Universidad San Carlos de Guatemala)****[91]***Contextualizing Commingled Remains from the Ex-Convento de Santo Domingo, La Antigua, Guatemala*

The ex-Convento de Santo Domingo was one of the first churches in La Antigua, Guatemala, and remained in use until its destruction by an earthquake in 1773. Most of the skeletal remains recovered from the ex-Convento de Santo Domingo were commingled, as individuals were periodically exhumed and reburied elsewhere in and around the church to make space for new burials. Laboratory commingling has further complicated the bioarchaeological analysis of individuals and the assessment of mortuary practices. This study uses osteometric pair-matching, epiphyseal union sorting, and the bone representation index, among other methods, to assess the use of each distinct mortuary space within the ex-Convento de Santo Domingo. These data are used in conjunction with data from archaeological excavations and historical documentation to recontextualize the remains. We also calculate the most likely number of individuals represented in each burial space.

**Worman, F. Scott (Missouri State University) and Elizabeth Sobel (Missouri State University)****[77]***“A rural backwater of poverty and illiteracy”: Preliminary Investigations at the Phenix Company Town Site*

For nearly a century, books, movies, and other media have portrayed the Ozarks region as isolated, rural, and backward. During the summer of 2019, we led an archaeological field school investigating a company town constructed by the Phenix Stone and Lime Company in southwestern Missouri. We documented remnants of public architecture, including the community hall, school, and church, as well as a barn and root cellars used by multiple families. We also identified architectural remains and domestic refuse associated with several households. In combination with our ongoing collection of oral histories and documentary research, the archaeological data are beginning to reveal a more complex and nuanced picture of life in the Ozarks during the late nineteenth and early twentieth centuries. Quarry workers and their families came from a wide range of backgrounds and re-shaped the demography of the area while participating fully in regional, national, and international economic networks. This project adds to our broader investigations of large-scale industrial production of lime, dimensional stone, marble, and other materials in the area; the environmental impacts of those industries; and the roles of race and class in mediating how economic change affected diverse households.

**Worman, F. Scott (Missouri State University)****[77]**

Chair

Wren, Linnea [59] see Spencer, Kaylee

**Wright, Aaron (Archaeology Southwest) and Myles Miller III (Versar)****[14]***The Question of Mesoamerican Deities in the Indigenous Pantheons of the Southern Southwest*

Comparative ethnographic studies of religious traditions and metaphors maintained by Southwestern and Mesoamerican societies have identified various strands of connectivity that factor into broader research around the nature of Southwest-Mesoamerican cultural and historical relationships. Archaeologists working in the American Southwest tend to use the connectivity established for the not-too-distant ethnographic past to support analogies between Mesoamerican and Southwest Indigenous ideologies, cosmologies, and religions in antiquity. Lacking pertinent oral histories and canonical texts, iconographies serve as the primary lines of evidence for any such analogy. Some researchers have gone so far as to use pottery designs to populate Southwest Indigenous pantheons with Mesoamerican deities. For the southern Southwest in particular, pecked and painted images of “goggle-eyed” figures and horned/plumed serpents have been presented as indicia of the Mesoamerican deities of Tlaloc and Quetzalcóatl within Mogollon and Hohokam religions, respectively. In this paper we review the current state of evidence pertaining to the spatial breadth and temporal depth of these iconographic motifs across the Southwest, and beyond, to evaluate the presence, if any, of these quintessentially Mesoamerican religious figures in Mogollon and Hohokam media and, by inference, religion.

Wright, Carrie [158] see Iorga, Anastasia

Wright, Henry [97] see Nash, Brendan

**Wright, Kevin (University of Oklahoma)****[140]***Considering Collaboration: Reflections for Students Wanting to Engage in Indigenous Archaeologies*

Indigenous archaeologies can produce holistic knowledge by building relationships with academic institutions and descendant communities. However, institutional policies frequently act as bulwarks preventing students from forming the relationships necessary for meaningful collaboration. By reflecting on my involvement with Choctaw Nation Historic Preservation’s (CNHP) efforts in protecting cultural sites, this paper offers insight into how students enrolled in degree-seeking programs can practice elements of community-based participatory research (CBPR). This paper also stresses the importance of Indigenous archaeologies by affirming their ability to directly benefit communities.

**Wright, Lori (Texas A&M University) and J. Alex Canterbury (Texas A&M University)****[53]***The Children of Group 4H 1, Tikal, Guatemala*

In 1962, Marshall Becker excavated a series of small residential groups on a peninsula jutting into the Bajo Santa Fe, east of central Tikal. These small residential groups would form the basis of his doctoral dissertation. Each sporting an eastern shrine structure, he dubbed this group type as “Plaza Plan 2.” Among them, Group 4H-1 produced a large number of human burials, as well as an extraordinary funerary deposit within Chultun 4H-9, which he designated Burial 107. We revisit the skeletal remains from group 4H-1 and report stable isotope data obtained from the teeth of these human burials. We report stable carbon, nitrogen, oxygen, and strontium isotopes to examine food consumption during childhood as well as place of childhood residence. This seemingly ordinary small household group had some occupants with interesting life stories.

**Wright, Sterling (Penn State University), Marine Chkadua (Georgian National Museum) and Laura Weyrich (Penn State University)****[111]***Characterizing the Ancient Oral Microbiome in the Northern Caucasus*

To date, the ancient oral microbiome in the Caucasus remains poorly understood and largely uncharacterized. Here, we present ancient DNA results of dental calculus samples from archaeological sites across Georgia, spanning from the Bronze Age to the Medieval period. In addition to having rich archaeological assemblages, previous paleopathological analyses were also performed on the individuals in which these samples were taken. These prior investigations concluded that the number of carious lesions and abscesses decreased over time, a greater number of antemortem tooth loss in the Antique period, a higher frequency of abscesses in females, and a greater prevalence of antemortem tooth loss and calculus observed in males. We test whether these pathologies could be correlated with oral microbiome composition. MapDamage and SourceTracker (v.2.0) were used to assess endogenous content. Quantitative and qualitative analyses to examine whether there are significant differences in oral microbiome composition according to time period, archaeological site, oral geography, age-at-death of an individual, and dental pathologies were evaluated using QIIME2. This study reveals that the ancient oral microbiome research can provide an additional framework in answering archaeological questions on a broad regional scale.

Wright, Sterling [111] see Gancz, Abigail

Wrobel, Gabriel [91] see Marshall, Aubree  
 Wrobel, Gabriel [216] see Stemp, W. James

**Wu, Dongming (Columbia University)**

[32]

*Identity and Economic Organization in Eastern Zhou China (770–256 BCE): A Statistical Analysis of the Sifangtang Cemetery*  
 This paper studies how copper mining was organized in the southeastern Hubei in the Eastern Zhou time through examining the social organization at the Tonglushan mines and the identities of the miners as reflected by the Sifangtang burials. The Tonglushan mines had the richest copper deposit in ancient China; the newly discovered Sifangtang site sheds light on how the mining community was reformed politically and economically during the great transformation after the fall of the Western Zhou dynasty. This paper adopts statistical method to analyze the burial data, which is especially powerful in revealing the patterns of human behaviors in archaeological record. The existence of typical Chu-style mortuary artifacts makes scholars argue that the cemetery belonged to the Chu invaders. However, a statistical analysis indicates that peoples of both Chu and local origins were buried in the cemetery though the social classes were strictly differentiated by burial practice and artifacts. This study thus presents a more complex picture of the social structure of the mining society than the dichotomy between invaders and locals. By situating the statistical result in historical context, this paper further manifests the correlation between political turbulence and economic transformation in the Eastern Zhou China.

**Wurtz Penton, Michelle (Versar Inc.), Peter Condon (Versar Inc.), Maria Hroncich-Conner (Versar Inc.), Ashley Norred (Versar Inc.) and Trevor Lea (Versar Inc.)**

[24]

*Intensive Survey of 4,400-Acres on the Sacramento Mountain Alluvial Fans: Settlement and Landscape Analysis within the Boles Well Water System Annex, Holloman Air Force Base, Otero County, New Mexico*

This poster presents a targeted examination of prehistoric landscape utilization and mobility patterns within the broader context of the Jornada Mogollon cultural of southern New Mexico. Between 2019 and 2022, Versar Inc. conducted an intensive cultural resources inventory of 4,400-acres (ac) in the Boles Well Water System Annex of Holloman Air Force Base, Otero County, New Mexico. Sixty-three prehistoric sites were identified and spatial analyses applied to further evaluate the social dynamics and landscape positioning of these occupations. The resulting data augments our current understanding of prehistoric mobility within the upland settings of the Sacramento Mountains and lowland environments of the Tularosa Basin. Finally, these datasets are discussed within the broader realm of cultural resource management on Holloman Air Force Base.

Wurz, Sarah [155] see Hodgskiss, Tammy

**Wyatt, Andrew (Middle Tennessee State University) and Clélie Cottle Peacock (University of Southern Mississippi)**

[136]

*A Practice-based Approach to Teaching Archaeology at the Undergraduate Level: Methods and Techniques Using Real-World Experiences at a Historic African American Community in Nashville, Tennessee*

Students learn best by doing, and this is particularly true when they experience the real thrills and joy of conducting actual archaeological excavations. Using practice-based approaches to teaching archaeology at the introductory undergraduate level, however, provides multiple challenges. We only see students for three hours a week (as opposed to a field school); we need to be able to complete excavations, from setting up units to backfilling, in a short amount of time; and we need to protect the site from the damage potentially caused by untrained archaeologists. In this presentation I will outline our practice-based approach to teaching archaeology at the undergraduate level at a historic African American neighborhood near Fort Negley in Nashville, Tennessee. This neighborhood was demolished in the 1940s, and in many ways has been forgotten, but it is significant as one of the first post-emancipation Black neighborhoods in Nashville. This historical significance aids in the students' understanding of the importance of archaeology as a discipline. As well as addressing challenges outlined above, I will discuss various other benefits of our project, including the use of field-trained anthropology majors in teaching students in the class, providing further positive experiences, and the positive attention the community receives.

**Wygal, Brian (Adelphi University), Kathryn Krasinski (Adelphi University), Charles Holmes (University of Alaska, Fairbanks), Barbara Crass (Museum of the North) and Kathlyn Smith (Georgia Southern University)**

[57]

*Mammoth Ivory Rods in Eastern Beringia: Earliest in North America*

The Holzman archaeological site, located along Shaw Creek in interior Alaska, contained two mammoth ivory rods, of which one is bi-beveled, within a stratigraphically sealed cultural context. Dated 13,600–13,300 cal BP, these are the earliest known examples of osseous rod technology in the Americas. Beveled ivory, antler, and bone rods and points share technological similarities between Upper Paleolithic Europe, Asia, eastern Beringia, and the Clovis tradition of North America, and are therefore important tool types in understanding the late Pleistocene dispersal of modern humans. The Holzman finds are comparable to well-known Clovis tradition artifacts from Anzick (Montana), Blackwater Draw (New Mexico), East Wenatchee (Washington), and Sherman Cave (Ohio). We describe these tools in the broader context of late Pleistocene osseous technology with implications for acquisition and use of mammoth ivory in eastern Beringia and beyond.

**Yaeger, Jason (University of Texas at San Antonio)****[156]***Peopling the Mopan Valley Landscape: The Legacy of Wendy Ashmore's Xunantunich Settlement Survey*

From 1991 to 1997, Wendy Ashmore co-directed the Xunantunich Archaeological Project, overseeing the Xunantunich Settlement Survey (XSS). With NSF funding, XSS conducted pedestrian survey of 590 ha, the largest survey in the Upper Belize River Valley at that time. The survey was followed by more focused, intensive excavation programs of agricultural terraces and hinterland communities of different scales, a comparative analysis of lithic assemblages, and geological and geomorphological studies. This research resulted in a much more robust and multifaceted understanding of the dynamic and changing socio and political organization of the Mopan Valley, the links that bound together hinterland settlements, and the ways in which hinterland people participated in larger political and economic processes. In this paper, I will discuss how these findings served as a springboard for later research in the valley. I focus particular attention on research that elucidates the active role of non-elite people in political and economic dynamics, the ways in which Preclassic people created meaningful landscapes and how those enduring landscapes influenced later people, the reasons for shifts in regional political authority, and the development of agricultural and social micro-landscapes throughout the valley. Through these cases, I will highlight Wendy Ashmore's broader contributions and legacy.

Yaeger, Jason [153] see Brown, M. Kathryn

Yaeger, Jason [54] see Cap, Bernadette

**Yamamoto, Atsushi (Yamagata University) and Ryan Clasby (Western Illinois University)****[84]***Centering the Ceja de Selva: Reexamining the Idea of the Eastern Andes as a Cultural Frontier*

The eastern slopes of the Andes, or Ceja de Selva, have traditionally been considered a frontier or geographical buffer zone between the Andes and Amazonian lowlands, an area defined primarily by its interaction with neighboring regions. Recent investigations, however, suggest that certain areas of the Ceja de Selva were densely populated with unique cultural traditions that developed over long periods of time. In this paper, we reassess the value of the term "frontier" for describing Ceja de Selva societies by presenting an in-depth diachronic analysis of the region's archaeology, particularly during the Formative period. We aim to show that Jaén was the locus of complex cultural developments organized around the region's principal rivers, and that societies from these zones engaged in extensive networks of both intraregional and interregional networks of exchange that helped to reinforce local identities while also stimulating trans-Andean contact.

Yamamoto, Atsushi [124] see Clasby, Ryan

Yáñez, Germán [221] see Meinecke, Helena

Yanez-Montalvo, Alfredo [48] see Torrescano-Valle, Nuria

**Yaworsky, Peter (Aarhus University) and Shumon Hussain (Aarhus University)****[47]***Terminal Pleistocene Environmental Changes and the Impacts on Human Reindeer Reliance*

The European Terminal Pleistocene is marked by periods of rapid climate change and long-term ecosystem transformation. Changing climates affected both human and faunal population distributions, thereby also structuring human diets, paleo-demography, and cultural processes. The interconnected nature of climate, diet, and demography can be studied in the archaeological record and can help us better understand the complex dynamics of how humans respond to rapidly changing ecologies, past and present. Here, we use downscaled paleoclimate data from Terminal Pleistocene Europe derived from PaleoView and a species distribution model of modern reindeer (*Rangifer tarandus*) distributions to predict past distributions of reindeer. Next, we test whether reindeer, as a high-ranked prey item, structured human land use and lithic technology from ca. 17,000 to 9,000 BP in post-LGM Magdalenian societies and transitional/early Late Glacial techno-complexes, and thus whether declines in reindeer habitat led to more generalized human diets and the incorporation of alternative or complementary prey items.

Yaworsky, Peter [47] see Vernon, Kenneth

Yepez Alvarez, Willy [157] see Kellner, Corina

**Yerkes, Richard (Ohio State University)****[119]***Assessing the Evidence for Ohio Hopewell Sedentism and Food Production*

Myths about Hopewell tribes persist. "Mound builders" myths faded but claims that Hopewell mounds and earthworks were built by sedentary farmers are taken as fact, even though all available evidence is not considered. Rather than argue "Hopewell were not sedentary farmers," following William Lovis, I examine "how do we know, or think we know, what we know" about Hopewell farming. We know that (1) "three sisters" farming (squash, maize, and beans) was not practiced before the late thirteenth century, (2) maize was not grown before AD 900, when (3) the first archaeological correlates of sedentary farming appear (e.g., bell-shaped storage pits, tools with "hoe polish," and fortified villages). Ofer Bar-Yosef and Richard Meadow stated that assertions about sedentism must be based on biological evidence such as (4) commensal species like rodents and small birds in faunal assemblages. Evidence for commensal species at Hopewell settlements is evaluated, along with (5) evidence for tooth cavities and dental wear associated with

high carbohydrate agricultural diets in Hopewell burials. Hopewell subsistence and settlement practices need not be unique, with no ethnographic analogs. Native American tribes have ties to the Hopewell. Collaboration and engagement with them are also needed to better understand Hopewell lifeways.

Yerkes, Richard [2] see Gyucha, Attila  
Yerkes, Richard [147] see Schultz, Julian

**Yeshurun, Reuven (University of Haifa), Hila May (Sackler Faculty of Medicine, Tel Aviv University) and Kathryn Crater Gershtein (AR Consultants Inc.)**

[191]

*Nesher Ramla Unit III: An Aurochs Mass Hunting Site?*

Large-scale accumulations of bison/aurochs remains exist in the European Middle Paleolithic, and are sometimes portrayed as mass hunting sites. Such accumulations are rare in the Levantine Paleolithic. Unit III is a distinct ~30 cm thick layer within the 8 m thick Middle Paleolithic deposits of the Nesher Ramla sinkhole (ca. 130,000 BP) in Israel. Numerous faunal and lithic remains, as well as minerals, manuports, and combustion features have been retrieved in this Unit in much greater densities compared to the overlying or underlying deposits. The anthropogenic faunal assemblage was mainly composed of aurochs and tortoise bones. To test the hypothesis that the aurochs assemblage in Unit III represent a mass hunting event or a few such events, we examined their age, sex, and taphonomy. We also present and discuss a unique find, a flint chip stuck in an aurochs tibia, with evidence to show that it resulted from a failed hunting attempt. The Unit III assemblage is heavily dominated by prime-age cows; while the classic natural herd demographic profile was not attained, it actually corresponds well with other Pleistocene and Holocene mass-hunting sites of bovines. We integrate bovine demography, hunting methods and carcass transport to explain the Unit III deposition.

**Yeshurun, Reuven (University of Haifa)**

[191]

*Chair*

Yeshurun, Reuven [191] see Varoner, Oz

**Yin, Ruixue, Fengshi Luan and Luc Doyon**

[139]

*Cultural Changes and Stasis in Bone Technologies circa the 4.2 kyr Event: Insights from the Yingjiacheng Site, Shandong, China*  
Changes in ceramics and prestige goods played an important role in defining historical chronologies retracing the emergence of complex societies in Ancient China. However, it remains unclear whether, and if so to what extent, these cultural changes also affected other aspects of material culture. Here, we present the analysis of bone tools found in Longshan ( $n = 79$ ) and Yueshi ( $n = 125$ ) contexts at Yinjiacheng, Shandong Province. We identify a continuum in the techniques used to manufacture bone tools during the Longshan and Yueshi eras. From a typological standpoint, both tool types and intra-typological diversity increase during the Yueshi compare to Longshan. Longshan tools are generally more standardized than Yueshi tools; the latter often show evidence suggesting they were expediently manufactured. We argue this pattern reflects the preservation of a common know-how among the human groups occupying Yinjiacheng throughout the Longshan to Yueshi eras. The typological diversification and decreased standardization observed during the Yueshi era are coherent with social groups adopting flexible technological behaviors to cope with deteriorating environmental conditions.

Yoder, David [225] see Allison, James

**Yoffee, Norman (University of Michigan)**

[163]

*Discussant*

**York, Logan (Archaeological Research Institute), Marcus Schulenburg (Archaeological Research Institute), Evan Rouse (Archaeological Research Institute) and Aaron Comstock (Indiana University)**

[20]

*Testing Eastern Woodland Metallurgy: Reconstructing a Conducive History*

Native America has a history of copper working extending back 8,500 years, making early Native coppersmiths contemporary with early copper work documented at Yarim Tepe and the Timna Valley in southwest Asia. The archaeology of coppersmithing in the Midwest has identified quarries in Michigan's Keweenaw Peninsula, and a workshop in Cahokia, where it is assumed copper was worked in open fires. With these open fires they supposedly created both sheets of copper to be chiseled into artful pieces and crafted utilitarian copper tools. Based on these finished pieces, we seek to examine the efficacy of working copper in open fires by experimentally reproducing both sheet copper art and copper tools. Our methods are guided by a combination of the archaeological record, previous experimental archaeology, and oral traditions of copperwork maintained among descendant communities. The data derived from this study provide both empirical and experiential insights into the time, energy, and methods that likely accompanied Native copper production and frame future investigations by our team.

York, Logan [114] see Comstock, Aaron

Young, Colleen [19] see Ross, Ann

Young, D. Craig [24] see Duke, Daron  
 Young, D. Craig [187] see Freund, Kyle

**Young, Lisa (University of Michigan), Hannah Hoover (University of Michigan) and Sarah Oas (Arizona State University) [141]**

*Native American Seed Keepers and the Watermelon*

Food sovereignty grows from seeds. Native American food sovereignty advocates are working to reconnect and return heirloom seeds to their communities of origin. Understanding the history of these seeds is an essential part of this repatriation process. In this paper, we explore seed sovereignty by investigating the history of watermelon grown by Native communities in North America. Watermelon (*Citrullus lanatus*) was introduced into the Americas during early contact between Indigenous communities and European colonizers. By the late sixteenth century, historic accounts document that Indigenous farmers in diverse regions of North America grew watermelon. Today, tribes in the Great Lakes and the American Southwest continue to grow heirloom varieties of red/brown seeded watermelon that has a long shelf life and is often shared at community events. Using archaeological, historical, and linguistic information, we explore the adoption and spread of watermelon in the past and seed keeping by Indigenous communities in the twentieth and twenty-first centuries.

**Young, Michelle (Vanderbilt University) and Nicholas Brown (Yale University)**

[192]

*The Origins of Civilization in the Central Andean Highlands: Contextualizing Atalla and Chawin Punta within the Chavín Phenomenon*

Richard Burger's foundational work on "Chavín and the Origins of Andean Civilization" revolutionized our understanding of early social developments in Peru. His research at sites like Chavín de Huántar and Huaricoto in the north-central highlands of Áncash, and on the Manchay culture of the central coast demonstrated both "unity and heterogeneity within the Chavín Horizon." The reasons for the emergence of ceremonial centers in the highlands south of Chavín de Huántar and the relationship between these centers were open questions raised by Burger that our research at the sites of Atalla and Chawin Punta have begun to clarify. In this presentation, we demonstrate how our research at previously unexcavated sites in the under-studied regions of Huancavelica and Pasco has both benefited from, and in turn contributed to, Burger's vision of a diverse yet interconnected Andean world around the turn of the first millennium BC.

**Young, Michelle (Vanderbilt University)**

[155]

*Chair*

Young, Michelle [155] see Smit, Douglas

**Yu, Xin, Hailin Liu and Chunxue Wang**

[158]

*A Study on the Animal Remains Unearthed from the Shengjindian Cemetery in Turpan, Xinjiang, China*

The custom of burying animals has continued in Xinjiang since the Bronze Age. Shengjindian cemetery is located in the southern suburb of Shengjindian Village, Turpan City, on the slope between the reservoir and Flaming Mountain, about 40 km away from Turpan City in the West. The existing cemeteries are oval, and the tombs are evenly distributed and orderly arranged. The cemetery dates to the Western Han Dynasty, between 2200 and 2050. The phenomenon of sacrifice in tombs is common, but there were only sheep, fewer goats, and more sheep. Sacrificed animals mostly occurred in the multiple burials, and there were two-story platforms in the tombs. Animals were usually placed on the container in the tomb. The sacrificial animals were not complete individuals and were more often skulls. The sex ratio and age distribution of sacrificial animals were balanced, and there was no clear selective tendency.

Yu, Xin [158] see Liu, Hailin

Yue, Hongbin [32] see Ledin, Lauren

Yusuf Mohamed, Osman [186] see Brandt, Steven

**Zacharias, Laura and Khori Newlander (Kutztown University)**

[114]

*Amateur Collections Need Love Too: How the Kramer Assemblage Adds to Our Understanding of Precontact Eastern Pennsylvania*

The farm fields of east-central Pennsylvania present ample opportunities for amateurs to amass amazing collections, often including artifacts that span much of regional prehistory. Yet collaboration between archaeologists and private collectors remains a contentious issue. Here, we present an analysis of the Kramer collection, an assemblage of hundreds of lithic artifacts collected over several decades from the fields surrounding Kutztown University. We describe the collection and compare it to lithic assemblages from other archaeological sites in the region. We find that the Kramer collection augments the understanding of regional prehistory

and lithic technological organization obtained by studying other archaeological sites in east-central Pennsylvania. Accordingly, we conclude that ethical collaboration between archaeologists and artifact collectors can be beneficial, especially in improving our understanding of regional prehistory and promoting stewardship of the archaeological record.

Zacharias, Laura [149] see Newlander, Khori

**Zaidner, Yossi (Hebrew University of Jerusalem)**

[191]

*Nesher Ramla Site, Late Middle Pleistocene Homo Behavior, and Modern and Archaic Homo Interactions in the Middle Paleolithic*

The open-air Middle Paleolithic site of Nesher Ramla, Israel, contains an 8m-thick archaeological sequence consisting of six stratigraphic units (Units I to VI). All units demonstrate evidence for in situ human activities containing large and well-preserved lithic, faunal, and ground stone tool assemblages, along with hearths and other well-defined spatial features all dated to Marine Isotope Stage (MIS) 5. An array of studies on lithic raw material exploitation, lithic technology and tool use, fauna, and use of fire suggest that the function and the importance of the site fluctuated throughout the sequence, but that it always was focused mainly on hunting and exploitation of animal resources. Discovery of the Middle Pleistocene (MP) *Homo* fossils in Unit VI dated to MIS 5e suggests that archaic *Homo* chronologically overlapped with *H. sapiens* in western Asia. Lithic analysis reveals that MP *Homo* mastered stone-tool production technologies, previously known only among *H. sapiens* and Neanderthals. The Levallois knapping methods they used are indistinguishable from that of concurrent *H. sapiens* in western Asia. The most parsimonious explanation for such a close similarity is the cultural interactions between these two populations. Nonetheless, specific cultural features associated only with Nesher Ramla *Homo* were also identified.

**Zaidner, Yossi (Hebrew University of Jerusalem)**

[191]

Chair

Zaidner, Yossi [191] see Falgueres, Christophe

Zaidner, Yossi [191] see Mercier, Norbert

Zaidner, Yossi [191] see Varoner, Oz

**Zaldivar, John Jhussein**

[181]

*Occupational Safety and Health into the Discourse of Archaeology in the Philippines*

Archaeological research in the Philippines has offered vast discourses through the convergence of science, humanities, and legal studies. It is also acknowledged that conducting archaeological research in the Philippines as a professional practice. And as a professional practice, there seem to be no formal discourse yet on the occupational condition of archaeological work in the Philippines. Varied spectrums of disciplines and professional circles had already recognized manpower as an asset and economic resource. And in the Philippines, there were legal frameworks that grant the rights of workers for a safe and healthy working condition. In comparison with counterparts outside the Philippines, there were publications that can serve as recommendations and suggestions. But with the COVID-19 pandemic in the Philippines, the occupational safety and health became a novel subject matter. It was at this time of pandemic where occupational safety and health initially came into discussions. This paper then will present occupational safety and health as an emerging topic due to the impact of COVID-19 pandemic and as one of the unique challenging issues in the contemporary trends and themes for the discourse of archaeology in the Philippines.

Zapata Benites, Carlos [214] see Price, Seth

**Zaro, Gregory (University of Maine), Martina Celhar (University of Zadar), Igor Borzic (University of Zadar) and Dario Vujevic (University of Zadar)**

[226]

*What Lies Beneath: Revealing the Liburnian Character of a Roman Townscape in Northern Dalmatia*

Croatia's Ravni Kotari has been described as the most urbanized region of Dalmatia in antiquity. It supported the Roman colony of Iader (present-day Zadar) and a suite of municipia that included Aenona, Asseria, Corinium, Nedinum, and Varvaria. Although the distribution of settlements during Antiquity was certainly pronounced, the historical, epigraphic, and archaeological records make it clear that the Ravni Kotari had already experienced a period of intense urbanization during the preceding Iron Age. Yet, as with most ruined cities and towns, unraveling their millennial-scale histories has proven difficult due to the sheer volume of the archaeological deposits and the palimpsestic nature of urban records. However, recent collaborative work at Nadin-Gradina (Nedinum) is beginning to expose the ways in which the Iron Age settlement beneath continued to shape the local character of the town during the Roman era. With an explicit focus on urbanization and landscape change, the Nadin-Gradina Archaeological Project has documented a remarkable continuity expressed in the urban built environment from the early first millennium BCE into the sixth century CE. In this paper, we propose that the greatest factor in shaping the character of Antique Nedinum stemmed from its local roots in a Liburnian hillfort a millennium earlier.

**Zaro, Gregory (University of Maine)**

[226]

Chair

Zaro, Gregory [126] see Countryman, Jamie

**Zavodny, Emily (University of Central Florida), Jelena Jovic (Muzej grada Šibenika), Tatjana Kolak (Muzej Like Gospic), John Krigbaum (University of Florida) and George Kamenov (University of Florida)**

[2]

*Multi-isotope Investigation of Transhumance and Herd Management at a Copper Age site in Lika, Croatia*

Transhumance, or the seasonal rounds of livestock between various grazing grounds, was a significant economic and ecological development for farming communities in prehistoric Croatia. The timing and scope of the first iterations of this specialized animal management strategy, however, are still not well understood. Materials from ongoing excavations at the site of Stari Grad (4235–4050 cal BC) provide an opportunity to potentially identify and characterize this practice at the only known Copper Age settlement in the Lika region. Here we integrate faunal analysis with light isotope (carbon, oxygen, nitrogen) and radiogenic isotope (strontium, lead) ratios derived from bone and teeth to better understand how this prehistoric community managed its livestock. Our results suggest the adoption of more intensive husbandry practices during this period that were especially adapted to Lika's rugged environment and harsh climate.

**Zborover, Danny (Pacific Rim Project)**

[123]

*Colonial Seascapes: European Maritime Atlases as Sources for the Historical Archaeology of Southern Mexico*

The Spanish "Derrotero General del Mar del Sur" atlases and their English offshoots, the Hack(e) atlases, contain a trove of cartographic and historical information regarding the Pacific littoral of the Americas. Scattered today in repositories worldwide, these late seventeenth-century pictorial and annotated volumes depicted the major coastal towns, ports, bays, and islands from Baja California to Tierra del Fuego. A detailed comparison of the various atlas editions reveals an intense geopolitical rivalry between European maritime empires and the involvement of Indigenous groups, such as the Oaxacan Chontal, in the formation of the Transpacific Modern World. By reassessing these historical sources along with ethnographic data, experiential learning, and digital reconstructions of the coast, this presentation will highlight several categories of information represented in the atlases and that can be of interest to archaeologists, such as Indigenous and European colonial settlements and forts, isolated architectural features, and shipwrecks. Other useful information types include toponyms, ethnographic commentaries, raw materials and commodities central to the colonial economy, and trade routes.

Zechini, Mariana [190] see Means, Bernard

**Zedeño, María Nieves (University of Arizona), François Lanoë, Danielle Soza, Lucas Bond Reis and Lauren Bridgeman**

[216]

*Reimagining the Plains Archaic*

A few decades ago, Plains archaeologists debated whether to retain or abandon the term "Archaic" in their chronologies. At issue was a poorly defined Late Paleoindian–Archaic transition coupled with a dearth of evidence of broad-spectrum adaptation and decreased mobility seen in other regions. Yet, what evidence was available differed noticeably from south to north and east to west. Today, two archaic chronologies exist: one that retains the original term (e.g., Kornfeld et al. 2010) and one which uses the nondescript "Middle" term (e.g., Peck 2011). Given substantive chronological updates and new evidence, we argue that Plains societies, most notably those in the northwestern Plains, should rightfully be termed "Archaic." These mobile hunters' socioreligious developments, including a significant record of collective action, parallel or perhaps even connect to Archaic mound builders to the east. In turn, such developments point to ethnogenetic processes that began 5,000 ago, eventually leading to the formation of historically known groups.

Zeigen, Chen [191] see Hartman, Gideon

**Zejdlik, Katie (Western Carolina University), Zsolt Nyárádi (Haáz Rezsó Museum), Jonathan Bethard (University of South Florida), Kathryn Kulhavy (University of Tennessee, Knoxville) and Andre Gonciar (ArchaeoTek Canada LLC)**

[71]

*Investigation of a Hungarian Szekler Church (AD 1050–1800) in Harghita County, Transylvania, Romania*

Investigation of the Papdomb site in Transylvania, Romania is one of the largest and most comprehensive church excavations in Eastern Europe. Persistent Hungarian Szekler presence in the highly tumultuous Transylvanian landscape (since AD 1050) offers a unique opportunity to look at biological and community continuity through the lens of skeletal biology and mortuary context. Since 2014, 770 partial and complete individuals have been excavated from a space first used as a pre-Christian cemetery and then later as a formalized, rural church affected by changing theological practices. Interment of individuals ranges from perinate to old adult and in single and multi-person burials. Demographic analysis shows males, females, and non-adults had access to burial all over the mortuary space rather than restricted areas. Grave goods were minimal but the presence of coffin materials, coins, hairpins, and beaded headbands provide additional interpretive information. This is the first presentation of project objectives and results to an American audience. Our goal is to meet other scholars working in Transylvania and to generate discourse and collaboration via our work.

Zejdlik, Katie [71] see Bethard, Jonathan

Zewdu Tizazu, Michaela [186] see Brandt, Steven

Zhang, Changping [185] see Li, Yung-ti

Zhang, Cuimin [32] see Wang, Yifan

**Zimmer-Dauphinee, James (Spatial Analysis Research Lab, Vanderbilt University), Parker VanValkenburgh (Brown University) and Steven Wernke (Vanderbilt University)**

[9]

*Eyes of the Machine: Comparing Automated and Brute Force Satellite Surveys in the Andes*

Archaeological surveys conducted through the manual inspection of high-resolution satellite imagery are fundamentally changing how archaeologists conceive of large-scale regional and supraregional research. Regions that were once too inaccessible to effectively survey are now readily available for investigation and scales of research that were once inconceivably large can now be interrogated. However, such a manual survey remains labor- and time-intensive, and gruelingly monotonous. Far from a trivial issue, psychological research has demonstrated that low target prevalence, as is the case with archaeological features, substantially increases the likelihood of miss-errors (false negatives). As a result, important archaeological features may go unrecorded. To address this concern, this presentation examines the results of a survey conducted using state-of-the-art computer vision techniques (Convolutional Neural Networks and Contrastive Deep Learning) to autonomously identify archaeological features in high-resolution satellite imagery. The computer-assisted survey results are compared to data collected and edited by a team of experts through the GeoPACHA platform to examine differences in feature detection and to explore any biases introduced through either survey method.

**Zimmerman, Larry (IUPUI/Eiteljorg Museum)**

[195]

*Discussant*

**Zimmermann, Mario (Washington State University), Tom Connolly (University of Oregon), Shannon Tushingham (Washington State University), David Gang (Washington State University) and Thomas Stafford (Stafford Research LLC)**

[18]

*Nicotiana Residues Identified on Pipe Bowl and Stem from Fort Rock Cave, Oregon*

Fort Rock Cave, in the northern Great Basin of Oregon, is an iconic site best known for the recovery of dozens of sagebrush bark sandals and sandal fragments in 1938, subsequently dated to between ca. 10,300 and 9,000 years ago. In 2015 and 2016, the site was revisited to attempt locating undisturbed cultural deposits, and effort that confirmed the near total destruction of intact deposits at the site. But artifacts recovered from disturbed contexts included a pipe bowl of vesicular basalt and small diameter hollow bones caked with a tarry residue considered possible pipe stem fragments. Chemical residue analysis of these artifacts match residue signatures with chemical standards for nicotine, confirming the probable use of tobacco.

**Zimmermann, Mario (Washington State University)**

[18]

*Chair*

Zimmermann, Mario [18] see Adams, Betty

Zimmermann, Mario [18] see Shantry, Kate

Zipkin, Andrew [39] see Hirniak, Jayde

Zipkin, Andrew [90] see Murray, John

Zollinger, David [221] see Petrovic, Vid

**Zori, Colleen (Baylor University), Peter Tropper (University of Innsbruck, Austria), James Fulton (Baylor University) and Davide Zori (Baylor University)**

[132]

*Glass from the Medieval Fortified Castle of San Giuliano (Lazio Province, Central Italy)*

Glass production in Italy underwent significant technological changes in the Early to High Middle Ages, evidencing a shift from natron to plant-ash fluxed glasses. Recycling of earlier Roman glass, as well as combining natron and plant-ash cullet to produce glasses of intermediate chemical composition, occurred with variable frequency. We here present analysis of 32 glass samples from the site of San Giuliano, located in Lazio province about 75 km northwest of Rome. Excavations conducted there from 2015 to 2019 focused on a medieval hall comprising part of a fortified castle complex, with glass sampled from secure habitation surfaces or trash deposits spanning the mid-eleventh through mid-thirteenth centuries AD. pXRF and WDS-EPMA analyses reveal that while most of the glass was fluxed with plant ash, recycled natron glass cullet had been introduced into most or all the batches. The variation in glass composition attests to the reuse of raw materials, as well as the technological transition underway. The presence of these glasses at San Giuliano, a hinterland site situated along a corridor connecting Rome with the northeastern Italian peninsula, indicates how increasing economic exchange in the eleventh to thirteenth centuries made prestige goods like glass more accessible to those aspiring to greater social stature.

Zori, Davide [132] see Zori, Colleen

Zou, Qiushi [185] see Li, Yung-ti

Zou, Qiushi [185] see Su, Xin

**Zovar, Jennifer (Whatcom Community College), Erik Marsh (CONICET, Universidad Nacional de Cuyo, Mendoza) and Arik Ohnstad (Vanderbilt University)**

[87]

*Khonkho through the Ages: Memory and Ritual in a Living Andean Landscape*

John Janusek directed Proyecto Jach'a Machaca from 2002 to 2009, based around the Aymara village of Qhunqhu Liquilique, which is surrounded by three major archaeological sites. Khonkho Wankane was founded in the Late Formative and saw limited later reuse. Pukara de Khonkho was occupied during the Late Intermediate period, and Ch'aucha de Khula Marka was in use during the Inca and early colonial periods. Today, these sites are incorporated into the living community through ritual activity and historic remembrance. While initially designed to investigate the rise of Tiwanaku, research in this area grew to consider how the lived environment has been constructed within a living landscape over more than 2,000 years of occupation. Each site is emplaced within an environment that has long been inhabited by the remains of past human activity, and where other natural features are understood to have an agency of their own. In this presentation, we review the history of Proyecto Jach'a Machaca to assess what it has taught us about community formation within a living, historical landscape. We consider how the everyday and ritual practices of people living in different settlements at different times contributed to the creation of history and the construction of social memory.

**Zweig, Christina (University of Wisconsin–Milwaukee Archaeological Research Laboratory Center)**

[66]

*Beyond Boundaries: Interments Outside of Historic Cemeteries in Wisconsin*

Human burial sites in the state of Wisconsin are protected through Wis. Stat. § 157.70, and are defined as any place where human remains are buried. Specific to historic cemeteries, the boundaries for the burial sites are often defined by recorded deeds or plats of survey to indicate the extent of human interments. However, across cultures there are different requirements defined by traditions and rituals that determine the organization and placement of the dead, including interment beyond perceived cultural boundaries. Occurrences have been reported for the presence of human burials located outside and adjacent to historic cemeteries beyond the recorded boundaries of the burial site. The potential for the inadvertent disturbance of buried human remains generates challenges from a cultural resource management perspective, and predication of the potential for human burials outside of the cemetery's legal boundaries can allow for appropriate investigations and planning to avoid or mitigate potential disturbance to human burials. This review of previous findings of burials outside of cemeteries in Wisconsin can help determine what contexts there may be a higher potential for burials outside of the perceived cemetery boundaries, and decrease the potential for unforeseen mitigation during a project.

Zwyns, Nicolas [186] see Watson, Sara