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Presentations and posters that were officially withdrawn by March 31, 2021, but after the online meeting site was launched, have been marked as [WITHDRAWN] in the Final Program and Individual Abstracts; however, these presentation/poster placeholders will still appear on the meeting website.

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## **Symposium Abstracts**

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Throughout much of the Holocene, humans in many parts of the world have relied on ground stone milling tools to increase the amount and breadth of edible foodstuffs. Despite the favorable preservation generally afforded these tools, and the central role they once had in processing many plant-food staples, ground stone milling tools remain an understudied and undertheorized category of technology. This poster session highlights experiments and formal modeling approaches that explore investments of time, labor, or knowledge represented by ground stone milling tools. The posters integrate experimental data on technological choices with use-wear analysis, ethnographic data, and evolutionary models.

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

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

**[33] Poster Session • CURRENT ZOOARCHAEOLOGY: NEW AND ONGOING APPROACHES**

*(SPONSORED BY ZOOARCHAEOLOGY INTEREST GROUP)*

Zooarchaeology is a dynamic and diverse field in which many disparate approaches are used to understand human interaction with nonhuman animals. In this new era of research and education, many approaches of the past continue to hold merit while new approaches emerge with greater and greater frequency. This poster session, sponsored by the Zooarchaeology Interest Group, engages with this diversity by presenting posters with wide-ranging foci. Presenters discuss the approaches that they are currently using to address zooarchaeological problems and to disseminate zooarchaeological data. Posters range from pilot studies, field methods, analytical methods, and reports on the analysis of individual faunal assemblages to pan-regional syntheses of extant data, discussions of zooarchaeology's contributions to modern species conservation and management, and methods for engaging with and presenting zooarchaeological data. This includes strategies for teaching zooarchaeology in this new era of education. The goal of this poster session is to spark discussion about the myriad approaches employed in zooarchaeology today and the benefits of these approaches.

**[34] Poster Session • MCDONALD CREEK AND BLAIR LAKES: LATE PLEISTOCENE-HOLOCENE HUMAN ACTIVITY IN THE TANANA FLATS OF CENTRAL ALASKA**

In 2013, we began working at the McDonald Creek and Blair Lakes sites, located in the Tanana Flats area of central Alaska about 30 miles south of Fairbanks. Both sites contain multiple cultural components, representing human occupation from about 14,000 to 1000 BP. Preservation is excellent in these contexts with thousands of lithic artifacts, osseous materials, faunal remains, and paleoethnobotanical remains. In this poster symposium, we present current results of our interdisciplinary efforts, including stratigraphy, radiocarbon and IRSL chronology, site formation, soil micromorphology, lithic technological and raw material studies, zooarchaeological studies, paleoethnobotanical analyses, site-spatial analyses, and eDNA work.

**[35] Poster Session • BEYOND TRIAGE: PRIORITIZING RESPONSES TO CLIMATE CHANGE IMPACTS ON ARCHAEOLOGICAL RESOURCES**

(SPONSORED BY CCSAR)

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

**[36] Poster Session • GEOARCHAEOLOGY RESEARCH**

(SPONSORED BY GEOARCHAEOLOGY INTEREST GROUP)

This poster symposium focuses on geoarchaeological research. It provides a broad overview of natural and anthropogenic formation processes that have affected the distribution of artifacts and features in the archaeological record. Posters may identify and/or interpret natural formation processes and agents of postdepositional disturbance, and describe how they contribute to our conceptualization of past human behavior. Together these posters highlight research related to theoretical and practical foundations in geoarchaeology, and illustrate the dynamic relationship between a site's context and wide-ranging physical and biological processes. Posters may be specific to methodological or landscape archaeology approaches, or related to sediments, stratigraphy, or chronology.

**[37] Poster Session • RESEARCH HOT OFF THE TROWEL IN THE UPPER GILA AND MIMBRES AREAS**

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

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

The Defense POW/MIA Accounting Agency's mission is to provide the fullest possible accounting for our missing personnel from past conflicts to their families and the nation. We search for missing personnel from World War II, the Korean War, the Vietnam War, the Cold War, the Gulf Wars, and other recent conflicts. Our research and operational missions include coordination with countries and municipalities around the world, and also involves a growing number of partner organizations who work closely with the agency. DPAA has initiated and developed its partnerships program over just the past few years. This symposium offers a closer look at its results by opening a window into the efforts, and perspectives, of a select group of partners themselves. From university departments to cultural resource management firms, from the simple coordination of information to the complexity of launching massive field projects, from the involvement of accomplished scholars to passionate amateurs—the power of partnerships already excites. With more than 82,000 Americans still missing, however, we aim here to not only discuss the successes of the program but to also foster dialogue regarding how partnerships can be a sustainable and effective tool in the context of the accounting effort.

**[39] Poster Session • PEOPLE, CLIMATE, AND PROXIES IN HOLOCENE WESTERN NORTH AMERICA**

Regional research programs continue to explore the value of radiocarbon and dendrochronological databases for paleodemographic modeling. In western North America trends in population, subsistence, and settlement are being studied within several dynamic ecosystems. This poster session proposes to examine, and begin comparing, models of Holocene climate change and its impact (or lack thereof) on regional adaptations in Western North America. Some models now include multiple paleoclimatic and demographic proxies, but often neglect to explicate their theoretical models for either climate or demographic subsistence models. This session will explore the development and application of radiocarbon and stable isotope methods, including related cautions in statistical analysis and data interpretation, with regard to climate and demographic/subsistence models. Questions of causality in cultural change are examined in the context of the chronological resolutions of proxy datasets.

**[40] Poster Session • HUMAN ORIGINS MIGRATION AND EVOLUTION RESEARCH CONSORTIUM POSTER SYMPOSIUM**

The Human Origins Migration and Evolution Research (HOMER) Project is a collaborative effort that seeks to understand the emergence of human uniqueness. The last 100,000 years have witnessed the extinction of many species in the genus *Homo*, while *Homo sapiens* have undergone an unprecedented and successful global expansion. The biological, social, cognitive, and environmental factors behind this event have been the focus of archaeological and paleoanthropological research. To understand the origins of these behaviors, the HOMER Project built a large-scale research model, one that can compare *Homo sapiens* and sister species through a multiproject, transcontinental research collaboration. All project members share a standardized field and lab

methodology to generate a highly effective comparative analysis. HOMER uses data collected at archaeological sites in Italy, Malawi, and South Africa to examine the questions of when and how *Homo sapiens'* unique adaptations arose. In this symposium, HOMER students will present research conducted at these sites, involving archaeoinformatics, zooarchaeology, biological archaeology, and lithic analysis.

**[41] Poster Session • EXPERIMENTAL ARCHAEOLOGY IN RANGE CREEK CANYON, UTAH**

Since 2013, staff and students of the Range Creek Field Station (RCFS), eastern Utah, have been studying Fremont farming techniques by conducting actualistic farming experiments. These experiments are designed to understand the costs and benefits of irrigating and storing maize under modern environmental constraints. By farming small plots of maize at the RCFS, we are able to build expectations about what past farmers would have done. One experiment looks at the productivity of maize (yield) depending on amount of water given to each plot. A second experiment measures the costs of irrigation by constructing a simple surface irrigation system using only simple tools available 1,000 years ago to Fremont farmers. A third experiment records the rooting depth of maize plants watered at varying depth. A fourth experiment measures the costs and benefits of constructing small replica storage structures used by the Fremont. The posters in this session will discuss the results of these experiments and how the results inform on the archaeology of Range Creek Canyon and other desert farmers. The topics include actualistic experiments, excavation of historic ditches, changes in rooting depth of heirloom maize varieties, and variability in maize starch when watered different amounts during the growing season.

**[42] Symposium • CELEBRATING 20 YEARS OF SUPPORT: CURRENT WORK BY RECIPIENTS OF THE DIENJE KENYON MEMORIAL FELLOWSHIP FOR ZOOARCHAEOLOGISTS**

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

**[43] General Session • GENDER IN ARCHAEOLOGY: CONTEMPORARY DISCUSSIONS**

**[44] Symposium • IDENTITY, INTERPRETATION, AND INNOVATION: THE WORLDS OF ISLAMIC ARCHAEOLOGY**

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

**[45] Symposium • A NEW HORIZON: REASSESSING THE ANDEAN MIDDLE HORIZON (AD 600–1000) AND RETHINKING THE ANDEAN STATE**

The Andes has long been cited as one of the few global regions in which a pristine state emerged. Alongside Moche, archaeologists commonly position the Middle Horizon polities of Wari and Tiwanaku as the candidates poised to claim this distinction. Influential arguments frame these latter cities as geopolitical rivals at the center of expansive empires. However, expected networks of imperial administrative centers have not materialized. New empirical evidence suggests that Wari or Tiwanaku did not control expansive regions. These developments coincide with growing tendency to question the validity of the “state” concept more generally. Many archaeologists have responded to such critiques with novel theories. However, the idea of the neoevolutionary state has long shaped archaeological narratives. Andeanists have largely interpreted data in accordance with these models. Without underestimating the influence of Wari or Tiwanaku, we ask participants in this session to reexamine patterns in the archaeological data. We urge participants to propose new models of Middle Horizon polities and interregional interactions that attend to the construction and eventual abandonment of historically specific political institutions, discourses of authority, and notions of community. We encourage a focus on the motivations and desires that could have shaped these processes.

**[46] General Session • CONTEMPORARY CONCEPTS IN ANCESTRAL PUEBLOAN ARCHAEOLOGY**

**[47] General Session • USES OF SURVEY IN WORLDWIDE CONTEMPORARY ARCHAEOLOGY**

**[48] Symposium • RECENT MULTIDISCIPLINARY INVESTIGATIONS IN THE MIRADOR BASIN, GUATEMALA**

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

Recent multidisciplinary archaeological investigations in the Mirador Basin of northern Guatemala have determined the presence of an extraordinary concentration of large and early Maya sites in a circumscribed area. These sites are connected by a dendritic web of causeways that were an integral part of early state formation within the geographically and geologically defined system. Such

infrastructure facilitated economic, social, and political development and stability in the Middle and Late Preclassic periods as evident by the quantity and density of Preclassic Maya sites and associated structures, architectural monumentality, uniform economic, political and religious ideologies, the development of integrated agricultural and hydraulic logistics systems, and exchanges of goods and commodities that allowed for the formation of an early state system in northern Guatemala. The primary focus of the investigations are (1) the origins of complex societies in this region and related environmental and geological phenomenon; (2) the cultural, political, and economic dynamics that sustained and maintained the system; (3) the causes and implications of the demographic degradation and collapse of a what was a vibrant and dynamic society; and (4) the conservation, protection, and economic sustainability of the tropical forest system and the associated cultural resources within the basin.

**[49] Symposium • REFINING ARCHAEOLOGICAL DATA COLLECTION AND MANAGEMENT TO ACHIEVE GREATER SCIENTIFIC, TRADITIONAL, AND EDUCATIONAL VALUES**

(SPONSORED BY ARIZONA ARMY NATIONAL GUARD)

Archaeological data have much to offer in learning about the past, preserving heritage, contributing to cross-disciplinary scientific studies, and informing on public policy. Cultural resource management (CRM) efforts are producing an ever-increasing volume of archaeological data. Yet, once data are collected and reported on for individual projects, they typically remain dormant and largely untapped. Current CRM data collection and management methods are not often designed to cumulatively and longitudinally address major research topics within archaeology and other disciplines, and their accuracy and reliability are rarely tested. Additional problems are that CRM data are often difficult to access, inter-operationalize, and reuse, and are challenging to synthesize at a broad scale. Moreover, there have been few incentives in CRM to explore multiple methods and data models that can refine or augment standard approaches. Papers in this session will explore methods, mechanisms, and requirements for refining data collection and management in CRM that will enable archaeological data to be more broadly accessible and useful to multiple disciplines and constituencies.

**[50] Symposium • THE PALACE OF XALLA IN TEOTIHUACAN: A POSSIBLE SEAT OF POWER IN THE ANCIENT METROPOLIS**

The Xalla palace is located 235 m to the north of the Pyramid of the Sun. Since 1997, it has been under research by my "Teotihuacan: Elite and Rulership: Excavations at Xalla and Teopanazco Project." This multifunctional palace may have been one of the seats of power for ancient Teotihuacan: it has an unusually large size in the context of the city, with a surface of approximately 55,000 m<sup>2</sup>. Also, it is not located along the Street of the Dead, but 235 m east from this avenue, providing a sense of privacy; it is isolated by a double wall about 3 m wide that would have allowed watchmen to walk around it. This symposium will deal with the first results of the extensive excavations by Linda R. Manzanilla from 2000 to 2020; the possible functional sectors; and the results of different analyses: archaeomagnetic and radiocarbon dating; lapidary objects, pigments, mica, marine shells, worked bone, faunal remains, figurines, and ancient DNA.

**[51] Symposium • DANCING THROUGH ICONOGRAPHIC CORPORA: A SYMPOSIUM IN HONOR OF F. KENT REILLY III**

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

**[52] General Session • NORTH AMERICAN ARCHAEOLOGY**

**[53] Symposium • FROM THE PLAINS TO THE PLATEAU: PAPERS IN HONOR OF JAMES D. KEYSER**

Growing up in Ronan, Montana, within the Flathead Indian Reservation, instilled James D. Keyser with a keen interest in Northern Plains archaeology and anthropology. PhD studies at the University of Oregon expanded the scope of his interests to the Plateau. Both regions have been the focus of his research for the subsequent four decades. Although Keyser's early publications in the 1970s and early 1980s focused on subsistence and lithics, he increasingly began to focus on his real interests: the iconography of ledger drawings and rock art. By the 1990s Keyser added ethnographic interpretations to this mix. His efforts have yielded numerous sites documented, with detailed symbolic and historical interpretations, creating a body of evidence about Northern Plains and Plateau iconography that rivals the knowledge accumulated in other archaeological subdisciplines. The papers in this session reflect Keyser's research interests, approaches, and results, in some cases constituting additions to our understandings of the art and iconography in these two regions, in others applying his methods elsewhere, but in all cases emphasizing the significance of research on iconography, art, and the prehistoric past.

**[54] General Session • ARCHAEOLOGIES OF CALIFORNIA AND THE GREAT BASIN**

**[55] Symposium • INCREASING THE ACCESSIBILITY OF ANCIENT DNA WITHIN ARCHAEOLOGY**

Building on 2019's session examining how ancient DNA research can best support the goals of archaeology, we focus this year's session on how ancient DNA research and the data it generates can be made more accessible to archaeologists, and why this is essential for the future of archaeogenetics. The field of ancient DNA continues along a trajectory of rapid growth, with many studies now analyzing tens or hundreds of individuals from previously unexplored regions of the world or periods of time. This trend emphasizes the need for an increase in the quantity and quality of communication between archaeologists and geneticists surrounding the standards and guidelines used to develop research agendas as well as the analytical methods used and interpretations made in studies of the past. The papers in this session provide examples of integrative archaeogenetics projects, present methodological developments that have enabled such projects, and otherwise discuss and explore the symbiotic relationship between archaeology and genetics. By increasing the transparency of our research and taking further steps toward a common language understood by researchers from these different, but complementary, disciplines, the papers in this session broadly contribute to the overarching goal of furthering active dialogue between archaeologists and geneticists.

**[56] Lightning Rounds • MULTISCALAR APPROACHES TO EXTRAPOLATING SOCIOPOLITICAL BOUNDARIES IN THE MAYA LOWLANDS**

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

**[57] Forum • WOMEN IN THE SAA: ISSUES FOR THE NEW MAJORITY**

Neither the SAA nor AAA requires members to identify as male or female, so the ratio of men to women members is estimated. From voluntary identifications and numbers seen at meetings, women appear to be half the membership of the SAA. 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? More archaeology PhDs are earned by women 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—instead, women are funded for lab work? Some women challenge conventional models and regional or disciplinary boundaries: does this marginalize them, or have they been marginalized as women? An “archaeologist” used to be a man at a major university or a museum curator, freed of all but professional responsibilities by a wife who also typed his publications. Now we see couples pushing strollers through meetings, both spouses presenting papers. What can the SAA do to level the playing field and lessen players' stress?

**[58] Symposium • INFERENCE IN PALEOARCHAEOLOGY**

In interpreting the archaeological record, archaeologists either explicitly or unknowingly construct inferences on the basis of referential knowledge or models that are external to that record. Common sources of this knowledge include experiments, ethnography, social studies, biological theories, and our own experiential logic. However, the application of these “middle-range theories” in interpreting emergent properties of the paleo-record often employs a single line of hypothetico-deductive reasoning as a direct path to all levels of behavioral interpretation. This risks reducing the complexity of record formation to singular explanations, and producing interpretations that are predetermined by the units of analysis of the models used. Our discipline has been aware of these theoretical and practical issues. Nonetheless, and despite the increasing multitude of available data and the variety of advanced analytical approaches, overcoming these issues when inferring past behavior is still extremely uncommon. With examples including stone, osseous, sediment, and other kinds of archaeological finds, we aim for presentations exploring and enacting different ways of alternating between the models and the data to construct archaeological inference.

**[59] Electronic Symposium • PLACE-MAKING IN INDIGENOUS MESOAMERICAN COMMUNITIES PAST AND PRESENT**

Throughout prehispanic Mesoamerica, community was defined by a shared identity based on a relationship to sacred geography and a charter with specific progenitor deities. Nahuatl-speaking communities were conceptualized as *altepetl* “water-mountain,” a concept shared broadly across Mesoamerica. Classic Maya foundational narratives feature a central water source surrounded by four sacred directional mountains. More recent expressions of these concepts are seen among the Tz'utujil Maya in highland Guatemala, where creation is said to have begun at Lake Atitlán, and in Yucatecan communities organized around *cenotes*. This symposium explores examples of place-making strategies utilized in prehispanic sites in the Maya area and Oaxaca, protohistoric settlements in Chiapas, sixteenth-century communities in Guerrero and Yucatán, the late nineteenth-century Caste War period in Yucatán, and highland Guatemala today. Strategies discussed include the creation of sacred space—and community building—through ritual processions, artistic programs, and reengagement with ancestral structures; mapping communal history to maintain control over lands; transferring wealth to reproduce socio-geographic identities; activating domestic and sacred space through renewal rituals; defining particular places as living space by enacting ceremonies to harness the energy within the natural and built worlds; and the performance of traditional Maya rituals within built environments derived from European models.

**[60] Forum • INCREASING TRANSPARENCY IN THE SAA**

White, colonial institutions are often hierarchically organized to improve efficiency and the flow of information in meeting their mission. As a result, decisions are generally made in relative secrecy, information flows from the top of the hierarchy to lower echelons, and it is difficult for those who lack power to understand the inner workings of an organization and how to effect change. Anti-racist values, when engaged intersectionally, compel us to transform policies, procedures, and practices that promote secrecy and create conditions of greater transparency to ensure a more equitable distribution of power that creates a more humane organization. In this forum we hold an open and frank conversation with some of the SAA's leaders and gatekeepers to determine what barriers the SAA faces in claiming an anti-racist identity and how they can be overcome.

**[61] Symposium • THE PRECLASSIC LANDSCAPE IN THE MOPAN VALLEY, BELIZE**

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

**[62] Symposium • RAISE YOUR GLASS TO THE PAST: AN EXPLORATION OF THE ARCHAEOLOGY OF BEER**

In its earliest forms, beer was vastly different from the beverage we enjoy today. Third-millennium BCE written records in Mesopotamia suggest that beer had already been brewed and enjoyed for hundreds if not thousands of years. Beer was brewed in temples by designated brewers but was also brewed at home by women for their households. This beer could be brewed, fermented, and served all in the same container. It had an exceptionally short shelf life and was drunk through straws to avoid the surface-floating detritus. Even with these differences, ancient beer shared the common presence of ethanol with our modern libation, as well as its usage in social gatherings and feasts. Here we explore beer's deep time (pre)history through a variety of eras and locations. Our goal is to highlight the diverse brewing and consumption patterns of beer around the globe and across the millennia. Unhindered by modern definitions limiting beer to barley, water, hops, and yeast, ancient peoples used their favorite ingredients to craft libations unique to their cultural milieu. These ancient brews were deeply steeped with meaning, were shared with both family and elites, and were used to create and maintain relationships between people and the gods.

**[63] Symposium • APROXIMACIONES ARQUEOLÓGICAS Y PALEONTOLÓGICAS EN SANTA LUCÍA, MÉXICO**

En el año 2019, en el noroeste de la Cuenca de México, comenzó la construcción del nuevo Aeropuerto Internacional Felipe Angeles y, con ello, un proyecto de salvamento arqueológico y paleontológico que, hasta el momento, registra 16 áreas con material prehispánico, así como más de 200 puntos de hallazgo con restos de megafauna correspondientes al Pleistoceno Tardío. El objetivo de este simposio es el presentar, de la propia voz de quienes son partícipes, algunas aproximaciones de ambos focos de interés dentro del proyecto y, a través de las exploraciones arqueológicas, dar un panorama general de lo que fue el antiguo Lago de Xaltocan desde hace 2500 años hasta la época prehispánica.

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

(SPONSORED BY TEACHING ARCHAEOLOGY INTEREST GROUP)

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

**[65] Symposium • THE BIG BEND COMPLEX: LANDSCAPES OF HISTORY**

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

**[66] Symposium • ARCHAEOLOGY IN THE XINGU RIVER BASIN: LONG-TERM HISTORIES, CURRENT THREATS, AND FUTURE PERSPECTIVES**

This session brings together researchers working in different portions of the Xingu River basin, a primary tributary of the Amazon. Recent archaeological and anthropological research reveal a complex and diverse cultural and environmental history extending from late Pleistocene to contemporary Indigenous, Maroon (*quilombola*) and riverine (*ribeirinhos*) occupations. The session focuses on core areas of the basin, the "Xingu corridor," which forms one of the largest protected areas of tropical biocultural diversity in the world. It highlights how Indigenous and traditional communities and practices have created complex anthropogenic landscapes over the millennia and have significant implications for conservation and sustainability in the region today. Current pressures include a

spike in deforestation in the southern Amazon's "arc of deforestation," which threatens local communities, biodiversity, and the functional integrity of regional ecosystems. The session considers the Xingu basin as a meso-scale area of analysis in Amazonia, a level of analysis generally lacking from regional studies, which tend to focus on minimal sampling in small plots or macroscopic remote sensing analyses to the expense of in-depth contextualized studies. Such in-depth studies, by necessity conducted in partnership with local communities, are precisely what is needed for archaeology to be relevant cultural heritage rights and sustainability.

**[67] General Session • CONTEMPORARY BIOARCHAEOLOGY AND SKELETAL ANALYSES**

**[68] General Session • PAST AND PRESENT IMPLICATIONS OF ENVIRONMENT AND CLIMATE**

**[69] Symposium • THEM AND US: TRANSMISSION AND CULTURAL DYNAMISM IN THE NORTH OF PERU BETWEEN AD 250 AND 950: A VISION SINCE THE RECENT NORTHERN INVESTIGATIONS**

The Mochica, Cajamarca, (pre)Chachapoyas, and Huamachuco, among others, have been the focus of attention of the last decades in the northern archaeology. The more we approached an internal understanding of the cultural dynamics of each region, more evidence of contact between them was recorded in the archaeological remains. In recent years the work on the north coast, the north mountain range, and northwestern Peru opened a new debate about the process of cultural transmission and dynamism in the area between AD 250 and 950. A lapse in time that was marked by important climatic alterations, intense movement of populations, and a process of integration that clearly broke with impermeable territorial paradigms; conversely, the ethnic identity that is associated and strengthened by an exposure to the "other." This symposium looks to analyze and understand the territorial dynamic and the conception that a cultural group had of the others in the valleys of the north coast, the northern mountain range, and the eastern flanks of the Andes. We will discuss aspects of the verticality and horizontality in the Peruvian north, starting with the mobility of goods, diffusion of ideas, populational displacement, stylistic integrations, and the local transformations of foreign elements.

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

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

**[71] Symposium • LANDSCAPES: ARCHAEOLOGICAL, HISTORIC, AND ETHNOGRAPHIC PERSPECTIVES FROM THE NEW WORLD / PAISAJES: PERSPECTIVAS ARQUEOLÓGICAS, HISTÓRICAS Y ETNOGRÁFICAS DESDE EL NUEVO MUNDO**

The study of landscapes in archaeology has a long and venerable history. In the New World, Willey, Sanders, Kidder, Haury, Parsons, Piña Chan, Lorenzo, and Armillas, among others, began pioneering research that reoriented archaeology toward a regional perspective concerned with settlement patterns, population, and the environment, starting around the middle of the last century. This research agenda further evolved in the 1990s by incorporating geographical and historic perspectives drawn from Carl Sauer and Fernand Braudel and has thrived, making vital contributions. However, disciplinary isolation has partially impeded further development of archaeological research and its capacity to articulate with sister disciplines concerned with landscapes (e.g., historic studies, agroecology, common pool resource management, and sustainability, etc.). Also, engagement with paleoecology has tended to be sporadic, nonsystemic, and post hoc. Thus, this symposium seeks to bring together a group of scholars from within and outside of archaeology to address these lacunae with the goal of increasing dialogue with sister disciplines.

**[72] General Session • WORLDWIDE ZOOARCHAEOLOGICAL RESEARCH**

**[73] Forum • TROWELS, BLOGS, AND PODCASTS: THE EXCITEMENT AND CHALLENGE OF MEDIA USE IN THE INFORMATION AND MISINFORMATION AGE**

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



**[74] Symposium • GEOMETRIC MORPHOMETRICS IN ARCHAEOLOGY**

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

**[75] Forum • TRIUMPHS, CHALLENGES, AND POSSIBILITIES IN HERITAGE EDUCATION**

*(SPONSORED BY THE HERITAGE EDUCATION NETWORK (THEN))*

The past few years have witnessed major accomplishments in heritage education, including the successful implementation of new and established public outreach programs and additions to the scholarly and popular literature on programming and its assessment. There are many challenges remaining, though. Heritage educators are still not reaching all the audiences they need to reach, particularly among those currently underrepresented in heritage professions. Funding also remains a perennial problem and looting is on the rise internationally, though agreements among countries and a growing number of academic programs have increasingly focused on cultural heritage. The Heritage Education Network (THEN) invites the audience to participate in a forum focused on evaluating what has worked in heritage education in the past and what challenges remain. One of the Heritage Education Network's core goals is "to provide a forum and network for practitioners, professional educators, and the public to communicate and collaborate about heritage education." Toward that end, what concrete steps can we take collectively in the future to reach across disciplines and specialties and help each other achieve our educational goals? What solutions can we devise for the challenges we face as we enter a new decade?

**[76] Symposium • NEW LIGHT ON DZIBANCHÉ AND ON THE RISE OF THE SNAKE KINGDOM'S HEGEMONY IN THE MAYA LOWLANDS**

Since 1995, the Kaanul (Snake) kingdom has been known as one of the most influential states in Classic Maya history. According to epigraphic evidence, its kings acted as overlords over most of the southern and central Maya Lowlands' kingdoms. The notion that a vast hegemony encompassing much of the lowlands has since subverted prior assumptions on the complexity and scale of Classic Maya states. However, many questions remain regarding the place of origin of the Kaanul kingdom and the processes that led to its rise as a hegemonic state, as well as a nuanced understanding of the nature of the hegemony. The location of its capital had long been a subject of debate, first erroneously identified with La Corona, Guatemala, then, correctly, with Calakmul, Campeche. Later finds leave little doubt that before Calakmul, the site of Dzibanché, Quintana Roo, was an earlier capital of the Kaanul kingdom. Here we present currently available archaeological, lidar, and epigraphic data recovered from Dzibanché and affiliated lowland sites with updated interpretations on the early history of the Kaanul kingdom and on the urbanistic features of the center of a hegemonic Classic Maya state.

**[77] Symposium • CASE STUDIES IN TOOLSTONE PROVENANCE: RELIABLE ASCRIPTION FROM THE GROUND UP**

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

**[78] General Session • CURRENT RESEARCH IN BRONZE AGE AFRICA, ASIA, AND EUROPE****[79] Forum • QUINTESSENTIAL SCHOLAR AND ROLE MODEL: DR. CATHERINE CAMERON AND A LIFE IN SOUTHWEST ARCHAEOLOGY**

This forum brings together a team of Southwest scholars who have worked with, learned from, and continue to be influenced by the work of Dr. Catherine Cameron. Her intellectual curiosity and publications have influenced generations of scholars worldwide. This uniquely formatted Festschrift will reflect on major themes of Cathy's work—Southwest archaeology, Chaco and its outliers, abandonment, complex societies, slavery, migration, fieldwork, mentorship, and service. Speakers will briefly discuss how Cathy's research and many roles as an academic, editor, public archaeologist, leader, mentor, and more have influenced them, followed by an open discussion with the audience about the impact Cathy has had on their research and in their lives.

### **[80] Symposium • ARCHAEOLOGY AND THE HISTORY OF HUMAN-ENVIRONMENT INTERACTION IN THE LOWER BELIZE RIVER WATERSHED**

This organized session presents archaeological investigations in the lower half of the Belize River Watershed. The Belize River East Archaeology (BREA) project was initiated in 2011 and comprises a study area between Belmopan and Belize City that measures roughly 6,000 km<sup>2</sup>. In the first decade of the project, the BREA team has documented over 100 ancient Maya settlements as well as numerous colonial period archaeological sites within the Belize River Watershed, most previously unrecorded. An overall goal of this interdisciplinary research has been to document changing human-environment interaction through time, specifically examining wetland use in this low-lying coastal zone. As home to the largest inland wetland in the country, this part of Belize is biologically diverse and provides a rich repository of sediments, fauna, and plant remains that offer important proxies for gauging climate change, such as drought, and for understanding the history of human-environment interaction through time. Perhaps not coincidentally, the area shows evidence of thousands of years of continuous occupation, beginning in preceramic times and continuing with ancient Maya and colonial period occupation. This session offers a comprehensive review of these finds.

### **[81] Symposium • PRESIDENTIAL SESSION: WHAT IS AT STAKE? THE IMPACTS OF INEQUITY AND HARASSMENT ON THE PRACTICE OF ARCHAEOLOGY**

Research and reporting on equity and harassment in the academy and across both public and private sectors has revealed the extent of chronic inequalities and significant problematic behaviors in a variety of workplace settings. Those most negatively affected by these often illegal behaviors are women, members of the LGBTQ+ community, and underrepresented minorities (URM). For archaeologists, workplaces include many locales (offices, labs, classrooms, field sites, conferences) and thus many potential sites for inequity, harassment, and assault to occur. This is not a women's problem, but a disciplinary issue affecting the very performance of archaeology. In addressing this looming and serious problem, this session brings together both students and professionals to consider (1) equity (e.g., gender pay gap, publication/citation practices), and (2) sexual harassment and assault (e.g., as experienced by different subgroups, effects on professional outcomes, effective training and reporting, resources for survivors, etc.). Wherever possible, papers include recommendations for future directions at several scales (e.g., individuals, workplaces, field settings, conferences). This session is timely, and we hope that highlighting these issues at the forefront of the SAA's annual meeting broadens the dialogue to the larger archaeological community so that we may collectively consider preventative solutions in addition to post-hoc sanctions.

### **[82] Symposium • AVANCES EN LOS ESTUDIOS DE LA ARQUITECTURA DE MONTE ALBÁN**

La ciudad prehispánica de Monte Albán, construida sobre un macizo montañoso en el centro del valle de Oaxaca es un emblema de la construcción masiva de expresiones arquitectónicas asociadas al poder de la cultura zapoteca y un referente en la arqueología mesoamericana. El desarrollo de nuevos proyectos de investigación para la conservación y restauración de sus basamentos, unidades residenciales, juegos de pelota, plazas otros elementos arquitectónicos, como es el caso del Proyecto Arqueológico del Conjunto Monumental de Atzompá, así como el Proyecto de Conservación de los Edificios Dañados por los Sismos del 2017 en Monte Albán-Atzompá; han permitido importantes descubrimientos sobre las técnicas constructivas, materias primas empleadas y acabados, componentes de una impecable arquitectura mediante la que los zapotecos antiguos solucionaron problemas complejos de ingeniería y al mismo tiempo dejaron manifiesta su cosmovisión. Con la aplicación de nuevas tecnologías no destructivas empleadas de manera conjunta con los métodos de la arqueología tradicional, estos proyectos logran una documentación novedosa.

### **[83] Symposium • WHEN THE WILD WINDS BLOW: MICRONESIA COLONIZATION IN PACIFIC CONTEXT**

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

### **[84] Electronic Symposium • MUSIC ARCHAEOLOGY'S PARADOX: CONTEXTUAL DEPENDENCY AND CONTEXTUAL EXPRESSIVITY**

Invoking "music" in archaeology triggers assumptions and questions about what is musical, who makes music, and the methodologies used to identify, determine, and explore musical concerns in archaeological materials and practices. Music-making, viewed as a cultural practice, is both contextually dependent and contextually generative-expressive. Therefore, archaeological inferences about music are particularly sensitive to anachronistic and cross-cultural biases. Music archaeology must somehow reflect material culture and perhaps address human experience, yet how? Such ontological and epistemological concerns become sidelined when tools and praxis are standardized; not the case for music archaeology, with its particular precedents, diverse contributing fields, and controversies aplenty. Definitions of music differ, constraining and compartmentalizing how music and sound are recognized, addressed, and integrated in archaeological research. For example, whether acoustical science is leveraged previously distinguished music archaeology from archaeoacoustics, which arose as separate fields, but appear synonymous to many. Shifting sonic terminology—such as "soundscape"—carries historical and disciplinary significance frequently misunderstood. Our session brings together practitioners of music archaeology across the Americas who take distinct and context-specific approaches. The papers and case-study summaries that introduce panelists in our group conversation foreground the ways that research perspectives and archaeological contexts shape methodologies, revelations, and interpretations.

**[85] General Session • WORLD WAR II ARCHAEOLOGY****[86] Symposium • THE CONCEPTUAL AND ETHICAL LIMITS OF HERITAGE IN ARCHAEOLOGY**

The papers in this panel will push the theoretical discussion about the material, economic, and legal aspects of archaeological sites and artifacts. Though a large literature focuses on the best practices and politics of heritage management, this has placed an overwhelming focus on how different academic, national, and local stakeholders create narratives around heritage objects. The goal here is to move the discussion beyond the politics of telling stories around heritage to examine the legal, technical, and ethical limits of how those sites are physically transformed and financially exploited. At stake is the need to create legally consistent and intellectually rigorous notions of heritage management that can help manage archaeological sites without reproducing hierarchies that have deep roots in the history of academic and museological institutions.

**[87] General Session • NEW WORLD CERAMIC PRODUCTION AND ANALYSIS****[88] General Session • CURATION, REPATRIATION, AND ACCESSIBILITY: VITAL ETHICAL CONVERSATIONS****[89] General Session • APPROACHES TO ARCHITECTURE IN MESOAMERICA AND THE ANDES****[90] Symposium • CURRENT DYNAMICS OF HERITAGE VALUES IN THE AMERICAS**

(SPONSORED BY HERITAGE VALUES INTEREST GROUP)

Heritage concerns the transmission of history, cultural traditions, and landscapes from the past into the present. Heritage can take many forms (tangible, intangible, natural). The heritage concept was developed in the nineteenth century by nation-states making heritage designations linked to provisions for funding and protection. In recent years, this top-down management of heritage has been challenged by numerous bottom-up movements of local groups who demand to be partners in determining what their heritage is and acquiring associated government support. This session brings together diverse case studies from the Americas: five papers discuss precontact archaeological heritage in Peru from the perspectives of archaeologists, local communities, and regional governments developing strategies for public education and protection of heritage sites and objects. One paper explores a Maya artist's discoveries of how to reproduce ancient Maya turquoise pigment from plant extracts. Two discussants will outline patterns in the papers and add reflections on heritage from a landscape perspective in the American Southwest. The year 2020 adds new questions regarding the pandemic's role in impacting and changing the values and management of heritage. Specifically, we ask: Can heritage be successfully communicated online or is a hands-on, personal experience part of its definition?

**[91] Symposium • BIRDS IN ARCHAEOLOGY: NEW APPROACHES TO UNDERSTANDING THE DIVERSE ROLES OF BIRDS IN THE PAST**

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

**[92] Symposium • REGIONAL SETTLEMENT NETWORKS ANALYSIS: A GLOBAL COMPARISON**

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

**[93] Symposium • NEW DIRECTIONS IN MONGOLIAN ARCHAEOLOGY**

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

**[94] Symposium • CULTIVATING CITIES: PERSPECTIVES FROM THE NEW AND OLD WORLDS ON WILD FOODS, AGRICULTURE, AND URBAN SUBSISTENCE ECONOMIES**

Systems of food production and distribution are closely tied to the economic organization and social structure of societies, particularly urban ones, where many households do not produce their own food. Urbanism emerged within specific historical and ecological settings with unique floral and faunal communities. These contexts inspired diverse practices of plant and animal exploitation, embedded within particular economic systems of production and distribution. Expanding archaeological research around the globe demonstrates that urbanism does not follow a one-size-fits-all trajectory, and yet our understanding of urban processes is still largely derived from studies in the Old World—particularly from cities where domesticated animals supplied crucial secondary products, such as fiber and dairy, and provided valuable labor for the transport of goods and intensification of horticultural practices. The papers in this session represent a diversity of urban systems by specifically examining aspects of foodways from both New World and Old World cities. Bringing together these papers in a comparative setting, this session endeavors to shed light on the common processes of urban provisioning, and to provide new understanding about urbanism as a global phenomenon.

**[95] Symposium • FAR WEST PALEOINDIAN ARCHAEOLOGY: PAPERS FROM THE NEXT GENERATION**

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

**[96] General Session • ARCHAEOOMETRY, MATERIAL ANALYSIS, AND MITOGENOME ANALYSIS: RESULTS FROM AROUND THE GLOBE**

**[97] Symposium • CONSTRUCTING CHRONOLOGIES I: STRATIFICATION AND CORRELATION**

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

**[98] Symposium • ADVANCES IN GLOBAL SUBMERGED PALEOLANDSCAPES RESEARCH**

*(SPONSORED BY ISLAND AND COASTAL ARCHAEOLOGY)*

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

**[99] Symposium • CABINETS OF CURIOSITIES: COLLECTIONS AND CONSERVATION IN ARCHAEOLOGICAL RESEARCH**

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

**[100] General Session • GIS, REMOTE SENSING, AND COMPUTER MODELING IN ARCHAEOLOGY**

**[101] Symposium • TEOTIHUACAN: MULTIDISCIPLINARY RESEARCH ON MESOAMERICA'S CLASSIC METROPOLIS**

Teotihuacan, always an important presence in Mesoamerica, has recently regained the spotlight with new discoveries and research. This research comes from multiple fields and disciplines. In this multidisciplinary session, we approach the study of Teotihuacan

through these multiple lenses in an attempt to create a cohesive image of the behemoth city of Mesoamerica's Classic period. Advanced students and professionals alike are invited to gather in these discussions of the legendary site.

**[102] Symposium • CHOLULA TO CHACHOAPAN: CELEBRATING THE CAREER OF MICHAEL LIND**

Friends and colleagues of Michael Lind were heartbroken to learn of his passing in late 2019. Mickey was a graduate of the University of Arizona with research specialization in precolumbian cultures. He went on to teach at the Universidad de las Americas in Cholula, Puebla, before finishing his career in the Santa Ana School District. Following retirement, his scholarship went into high gear. The scope of Lind's interests was vast, encompassing detailed analysis of context and content of ceramics he excavated at households in the Mixteca Alta to a magisterial synthesis of Zapotec religion at the time of the Spanish conquest. His excavations and subsequent analyses of Cholula's ethnohistorical accounts have profoundly shaped reinterpretations of the Postclassic period for this highland religious center. Excavations at the Valley of Oaxaca center of Lambityeco resulted in a long-awaited volume on Zapotec political and religious structures. This symposium is designed to celebrate the legacy of Mickey Lind, with contributions by students and lifelong friends who have been influenced by his teachings and collaborations on the archaeology and ethnohistory of Cholula, the Mixteca Alta, and the Zapotecs of Oaxaca.

**[103] Symposium • HEARTH AND HOME IN THE INDIGENOUS NORTHEAST**

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

**[104] Symposium • ANCIENT MESOAMERICAN POPULATION HISTORY: DEMOGRAPHY, SOCIAL COMPLEXITY, AND CHANGE**

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

**[105] Electronic Symposium • INTERACTIONS ACROSS THE NORTH AMERICAN MIDCONTINENT**

The North American Midcontinent, from the eastern Great Plains to the Ohio River Valley, provides extensive evidence of interaction among and within past cultural groups, interconnected by the Mississippi River watershed, the Great Lakes, and overland trails. For thousands of years, travel and exchange routes facilitated movement of information, ideology, and material culture, supporting long-distance social and economic networks. The material record of the Midcontinent allows for multiscale examinations of interactions spanning time and space. We interpret distributions of transported items as evidence of relationships amongst communities. Yet, boundaries of these archaeological cultures were more fluid or transitional than our organizational frameworks imply. While archaeologists often are forced to work within existing typologies, we recognize that boundaries were permeable and situational, with interactions regularly occurring among and across archaeologically defined groups. This session convenes scholars working across the Midcontinent to explore varied aspects of past interactions, which often fostered conflict, change, and innovation. By examining the nature and distribution of past material culture, we can better interpret the significance of motifs, styles, foodways, and other precontact material culture indicative of community association and (often) social change. Understanding such processes is critical in today's world of increasing globalization and connectivity.

**[106] Symposium • COMMUNITIES OF PRACTICE IN THE ANCIENT ANDES: THINKING THROUGH KNOWLEDGE TRANSMISSION AND COMMUNITY MAKING IN AND BEYOND CRAFT PRODUCTION**

The term "Communities of Practice" (CoPs) has been applied to craft production to describe the sharing, learning, and materialization of specialized knowledge in a localized and intimate context. Beyond craft production, CoPs can also offer a new approach to thinking about knowledge transmission between individuals and groups; for example, in ritual practice, subsistence technologies, mnemonics, etc. This symposium challenges its participants to explore this framework to identify and evaluate CoPs in the ancient Andes. What social, political, economic, ecological, or ideological circumstances allowed for the creation and maintenance of CoPs? What evidence or material markers can we use to understand CoPs in the Andean world? How did CoPs share knowledge across distant places and generations? Papers presented here span all periods and regions of the Andes and encompass topics such as craft production, gendered practices, ritual, architecture, bioarchaeology, food production and cuisine, and iconography.

**[107] Symposium • SCULPTURE OF THE ANCIENT MEXICAN GULF COAST, PART 1**

The ancient cultures along the Gulf Coast of Mexico produced some of the most significant sculptural traditions of Mesoamerica. The types of sculptures range from colossal heads, figurative statues, carved and plain stelae, large-scale terracotta sculptures,

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

**[108] Electronic Symposium • THE IRON AGE OF NORTHWEST PORTUGAL: LEFTOVERS OF BEHAVIOR**

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

**[109] Symposium • COLLABORATIVE AND COMMUNITY ARCHAEOLOGY**

This session focuses on archaeology projects involving varied and innovative collaborative efforts that focus on partnerships with local communities, especially tribal colleagues and related governments. Emphasis will be on the varied ways that archaeology can embody the various types of Community Engaged Scholarship as defined by Doberneck, Glass, and Schweitzer (2010, *Journal of Higher Education Outreach and Engagement* 14(5):5–35) including Research and Creative Activities, Teaching and Learning, Service and Practice, and Commercialized Activities. Presentations will also cover example trajectories of developing from research about to research for, in, and (or) with communities. Discussion will encompass ways to initiate relationships that lead to respectful, useful, and productive Community Engaged Scholarship.

**[110] Forum • THE FUTURE OF ARCHAEOLOGICAL REPOSITORIES?**

(SPONSORED BY THE CURATION INTEREST GROUP)

From large, multidisciplinary museums to small anthropology departments, and government-run facilities (federal, tribal, state, local) to local nonprofits, a diverse array of archaeological repositories houses the nation's collective heritage. A recently held Wenner-Gren Foundation-sponsored workshop focused on repositories and their "social lives" by exploring them as sites of social relations that operate to construct the past through their practices, policies, spaces, and networked actors. The highlights of that workshop will be presented, including the degree to which repositories operate independently or collaborate with various stakeholders. The goal of this forum, however, is to expand on the Wenner-Gren workshop and explore whether archaeological repositories would benefit by working together more cohesively and systematically. Would an association of archaeological repositories be a useful way to unite the different repository types? What would the possible mission, goals, and outcomes of such an association be? And, how might it impact the future of archaeology as a discipline?

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

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

**[112] Forum • COMMUNITY-ENGAGED METHODS IN BIOARCHAEOLOGICAL RESEARCH: RECENT ADVANCES AND NEW DIRECTIONS**

Over the past three decades, there has been a significant theoretical and methodological shift in bioarchaeology toward the more meaningful inclusion of descendant communities, worldviews, and knowledge into research programs. This shift has driven fundamental changes in how human skeletal remains are conceptualized in bioarchaeological discourse. Rather than viewing skeletal remains as specimens for scientific research, scholars now pose them as ancestors who have social lives and political importance in the present. The more widespread engagement with descendant and other stakeholder communities has also stimulated important discussions about the ethical responsibilities of bioarchaeologists toward interested publics, and the power dynamics underlying the study and representation of their material pasts. In this panel, discussants are invited to reflect on recent advances in public, collaborative, or community-based approaches in bioarchaeology. What are some of the key theoretical debates and ethical considerations defining the field today? How are they influencing scholarly approaches to either the study of archaeological skeletal remains, or practices for engaging with stakeholder communities? And finally, what are the implications of the current political moment for bioarchaeological research? By addressing such questions, this session hopes to define new pathways for collaborative bioarchaeological research in the future.

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

(SPONSORED BY OF COMMITTEE ON CLIMATE CHANGE STRATEGIES AND ARCHAEOLOGICAL RESOURCES)

Climate change affects archaeological sites at an ever-growing rate. There is neither enough funding nor enough excavators to dig our way out of the problem, while repositories are also underfunded and understaffed. When limited resources are available, ideally they are used for the maximum benefit of all stakeholders. This requires a broadly applicable transparent prioritization scheme. It must be usable within particular sets of constraints, like governmental agency missions or funding sources with restricted geographical or temporal interests. Several prioritization schema exist. Most are intended to deal with resources already determined to be important (World Heritage sites, National Parks, etc.). Challenges include ways to deal with sites of unknown potential, and to better balance the interests of all stakeholders, including underrepresented groups. This forum is envisioned as a way to move discussions forward. A planned companion poster session sponsored by the Committee on Climate Change Strategies and Archaeological Resources ("Beyond Triage: Prioritizing Responses to Climate Change Impacts on Archaeological Resources") will provide information on various approaches for prioritization, which we hope can form the basis for a broader discussion.

**[114] Symposium • HISTORIES OF HUMAN-NATURE INTERACTIONS: USE, MANAGEMENT, AND CONSUMPTION OF PLANTS IN EXTREME ENVIRONMENTS**

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

**[115] Symposium • APPROACHES TO THE ARCHAEOLOGY OF HEALTH: SEWERS, SNAKEBITES, AND SKELETONS**

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

**[116] General Session • DEATH AND SOCIAL PRACTICE IN THE NEW WORLD**

**[117] Symposium • THE ARCHAEOLOGY OF TRADE AND EXCHANGE**

The trade and exchange of resources between people throughout the world has been the building block for crucial human relationships. The reciprocity in these interactions has allowed humans to survive and thrive. This session will focus on the many different ways humans have managed these relationships throughout history and the archaeological signature these activities leave behind. This cross-cultural, comparative session will highlight cases from around the globe to demonstrate the breadth and variety of exchange interactions, to promote new ways of thinking about the archaeological impact of such endeavors.

**[118] General Session • TOPICS IN ANDEAN ARCHAEOLOGY**

**[119] General Session • EMERGING RESEARCH ON BUILT ENVIRONMENTS AND SOCIAL DYNAMICS IN MESOAMERICA**

**[120] Symposium • ART STYLE AS A COMMUNICATIVE TOOL IN ARCHAEOLOGICAL RESEARCH**

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

**[121] Forum • WE, THE VOYAGERS: OUR VAKA AND OUR MOANA, CONSIDERING A FILM SERIES BY TAUMAKO VOYAGERS**

(SPONSORED BY PACIFIC TRADITIONS SOCIETY)

**Part 1. Our Vaka (57 minutes):** We Polynesians of Taumako, Solomon Islands, share our history, motivations, and skills through storytelling and canoe building. We use the designs, materials, and methods of our culture-hero, Lata, who built the first voyaging vaka and navigated to distant islands. Chief Kaveia, our Master Navigator, leads us in planting gardens, feeding workers, making rope from plants, weaving and sewing sails, caring for our trees, adzing parts for voyaging canoes, and lashing them together. Kaveia enlists a sailor/anthropologist to help us make films. Kaveia dies and Chief Holani became our new Lata. We build a vaka and prepare for open ocean voyaging. Our living story of Lata teaches us to welcome everyone in Lata's crew, and how to avoid big mistakes. **Part 2. Our Moana (57 minutes):** We choose crew, including hard workers with skills, thieves, and people who sleep on the job. Our community blesses our vessel and crew. We learn to sail in Lata's arms, finding our way by interacting with patterns of winds, waves, stars, and lights our ancestors show us when we need them. We arrive at islands and learn what happened to family members since the last voyage some generations earlier. We reconcile, reaffirm our love for each other, and look to our reunited future. This is the real Moana with details of crew work, vessel performance, and our ancient navigation system. **Q&A / Discussion:** Topics include deficits and opportunities for analyzing artifacts of voyaging cultures, including vessels, oral traditions, cultural principles of inclusion and relationally, navigational knowledge systems, and relevance of ancient voyaging knowledge to climate change, sustainability, and resilience.

**[122] Symposium • SCULPTURE OF THE ANCIENT MEXICAN GULF COAST, PART 2**

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

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

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

**[124] Symposium • ARCHAEOLOGY IN MOZAMBIQUE: CURRENT ISSUES AND TOPICS IN ARCHAEOLOGY AND HERITAGE MANAGEMENT**

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

**[125] Symposium • SCALING POTTING NETWORKS: RECENT CONTRIBUTIONS FROM CERAMIC PETROGRAPHY**

Over the last two decades, ceramic petrography has played an integral role in deciphering the social networks associated with past pottery production and exchange. Pots themselves are the outcome of individual or collaborative practices governed by larger social bodies. While the burgeoning literature on communities of practice and technological style has made use of pottery analyses, we argue that the benefits of ceramic petrography to this kind of research have not been fully realized. Point-counting specifically provides information on tempering and forming techniques that were often mediated by kinship, marriage, and identity. Provenance data serve as evidence of object exchange that followed the contours of political and religious movements. At root, these insights share common ground; they tell us how pottery making was informed by specific kinds of relationships that existed between potters and larger social networks. The case studies presented here use a variety of techniques within ceramic petrography to decipher these relationships. Our goal is to showcase through diachronic, cross-cultural analyses the utility of using all aspects of petrographic analysis to better characterize past potting networks. We ultimately use these case studies to demonstrate how social archaeology can benefit by employing a multifaceted petrographic approach.



**[126] Symposium • PALEO LITHICS TO LEGACY MANAGEMENT: RUTHANN KNUDSON—INAWA'SIOSKITSIPAKI**

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

**[127] Symposium • FRYXELL AWARD SYMPOSIUM: PAPERS IN HONOR OF DEBRA L. MARTIN**

(SPONSORED BY FRYXELL COMMITTEE)

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

**[128] Symposium • DEVELOPMENTS THROUGH TIME ON THE SOUTH COAST OF PERU: IN MEMORY OF PATRICK CARMICHAEL**

The south coast of Peru has a rich past through which developments of Peruvian prehistory and broader anthropological themes can be studied. Research from Cañete, Chíncha, Ica, and Nasca is included here, spanning from the Early Horizon to the Late Intermediate Period. Early Horizon themes include the organization and function of Tajahuana within a regional context, and economic specialization among fishermen. Early Intermediate Period topics include models of exchange during the Paracas–Nasca transition, social relations within a civic-ceremonial center in Ica, and spatial and social configuration of communities within an urban settlement in Cañete. The Middle Horizon is addressed through research on symbolic behavior in Nasca household archaeology as well as Wari colonialism in Nasca. Subjects from the Late Horizon and Late Intermediate Period comprise Chíncha ceramics, the relationship between Inca administration and local Cañete practices, and the interaction of Chíncha elites with the Inca state. The presenters cover a variety of themes and theoretical perspectives but are united in their contributions to unfolding the South Coast past. This session is dedicated to the memory of Patrick Carmichael, a great scholar and friend whose survey work and studies of Nasca ceramics constitute a major contribution to archaeology.

**[129] Symposium • ANIMAL BONES TO HUMAN BEHAVIOR**

(SPONSORED BY ZOOARCHAEOLOGY INTEREST GROUP)

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

**[130] Symposium • CONSTRUCTING CHRONOLOGIES II: THE BIG PICTURE WITH BAYES AND BEYOND**

(SPONSORED BY THE SOCIETY FOR ARCHAEOLOGICAL SCIENCES)

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

**[131] Symposium • FINDING FIELDS: LOCATING AND INTERPRETING ANCIENT AGRICULTURAL LANDSCAPES**

Archaeological analysis of ancient agricultural fields can provide key anthropological insights into past subsistence strategies, communities' political economies, environmental entanglements, and ideologies of land, labor, and gender. And yet the subtle traces of agricultural fields (e.g., field boundary features, stone clearance mounds, anthropogenic soils, and artifact scatters) are among

the most difficult features to resolve archaeologically. Moreover, the expansiveness of ancient field systems combined with their often ephemeral nature make agricultural landscapes a serious challenge to preserve and protect as they are easily lost to erosional processes and modern development. This session brings together a group of scholars employing innovative new methods to discover, map, and interpret ancient field systems. These new approaches to fields explore the social and political contexts of agriculture, challenge colonial narratives about Indigenous field systems, and engage with emerging global discourses of the Anthropocene.

**[132] Symposium • POSTCLASSIC MESOAMERICA: THE VIEW FROM THE SOUTHERN FRONTIER**

Papers will consider the question of Mesoamerica's southern frontier during the Postclassic period (800–1520 CE) from the perspectives of El Salvador, Honduras, Nicaragua, and Costa Rica. Long considered peripheral from a world systems perspective, ethnohistorical accounts describe migrations from central Mexico to lands along the Pacific shore of Central America by Otomanguean- and Nahuatl-speakers in the centuries leading up to European contact. The chronology of these migrations is frustratingly vague, as are the explanations of why the migrations occurred. These historical accounts have been mined to highlight the Mexican connections, and in many cases have been incorporated into the cultural identities of these Central American countries. Using the ethnohistorical sources to guide hypotheses and structure interpretations, the past 20 years have been busy in terms of producing archaeological data to challenge and evaluate interaction scenarios relating "Mesoamerica" with neighbors from the southern frontier. These papers offer important new insights into the Mesoamerican frontier with substantive information and updated interpretations. Can these perspectives be used to revision what is "Mesoamerica"? Papers in this symposium provide archaeological case studies from throughout the region, as leading scholars attempt to critically integrate the ethnohistorical accounts with the material record.

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

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

**[134] Forum • REGIONAL LEADERSHIP FORUM**

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

**[135] Symposium • A CONSTRUIR PUENTES / BUILDING BRIDGES: DIÁLOGOS EN OAXACA ARCHAEOLOGY A TRAVÉS DE LAS FRONTERAS**

Over three decades ago, the volume *\*Debating Oaxaca Archaeology* (1990) was published. It was supposed to be an authoritative summation of current research and ongoing arguments in Oaxaca archaeology. However, several key voices were missing from both the volume and the debates, most notably from women, Mexican, and Indigenous scholars. Since that time, archaeologists and anthropologists working in Oaxaca have made incredible advancements in several different ways. New data and analyses from recent studies have greatly contributed to our overall knowledge about Oaxaca's past. There have also been several critical shifts in the theoretical framing of research to more practice-, agency-, and poststructuralist-oriented perspectives as well as increasing collaboration with descendant communities. Given these critical advancements, the goal of this symposium is to reexamine the arguments presented in *\*Debating Oaxaca Archaeology* and discuss how we have advanced, where we have made missteps, and where we still need to make changes. Most importantly, this symposium brings together American and Mexican-based researchers who work in Oaxaca so that we can continue to build bridges of dialogue between us. By connecting and bringing researchers together, we can solve present questions about Oaxaca's history and heritage while moving past old debates.

**[136] Symposium • ANCIENT MAYA EMBEDDED ECONOMIES  
(SPONSORED BY SOCIETY FOR ECONOMIC ANTHROPOLOGY)**

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

**[137] Symposium • PEOPLE AND SPACE: DEFINING COMMUNITIES AND NEIGHBORHOODS WITH SOCIAL NETWORK ANALYSIS**

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

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

Recent research indicates that, in terms of chronology, magnitude, and geographical location, the Ilopango eruption in Central America was one of two eruptions that caused the worldwide climatic crisis beginning AD 536 with distal effects that darkened the earth, brought on a 14-year cold spell in the northern hemisphere from Italy to Ireland, and led to crop failures from China to the Mediterranean and Mesoamerica. The event may have contributed to a major outbreak of bubonic plague in the Byzantine Empire. In Mesoamerica and Central America, effects of this catastrophe may have been felt from central Mexico to northern Colombia. Sometime around AD 539, Ilopango caldera provided a colossal Plinian eruption that had the proximal effect of blanketing an area of 10,000 km<sup>2</sup> with more than 80 km<sup>3</sup> of pyroclastic flows and ash. The immediate impact zone included all of El Salvador and adjacent portions of eastern Guatemala, western Honduras, and southwest Nicaragua, within a radius of about 100 km from Ilopango. Major centers were temporarily abandoned in an area of 20,000 km<sup>2</sup>. Trade routes in the southern Pacific regions of Central America were disrupted, and agricultural production was paralyzed for many decades.

**[139] Symposium • THE PRECOLUMBIAN DOTTED-DIAMOND-GRID PATTERN: REFERENCES AND TECHNIQUES**

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

**[140] General Session • MULTI-REGIONAL RESEARCH USING LITHIC ANALYSIS****[141] General Session • NEW AND ONGOING RESEARCH IN EAST ASIA****[142] General Session • ETHNOARCHAEOLOGY AND EXPERIMENTAL ARCHAEOLOGY****[143] General Session • LAND USES, INTERACTIONS, AND ICONOGRAPHY IN THE SOUTHWEST UNITED STATES****[144] Symposium • DOCUMENTING DEMOGRAPHICS IN ARCHAEOLOGICAL PUBLICATIONS AND GRANTS**

Since Joan Gero's (1985) pioneering article "Sociopolitics and the Woman-at-Home Ideology," feminist archaeologists have been gathering data on the gendered dynamics of archaeological publication and funding. After a lull in the early 2000s, this literature has been undergoing a renaissance. Recent publications have shown that NSF-funded senior grants (Goldstein et al. 2018), and articles in *American Antiquity* (Gamble 2020; Rautman 2014) and *Journal of Field Archaeology* (Heath-Stout 2020), are male-dominated due to differential submission rates rather than bias in the review process. Others have demonstrated that there is a "peer review gap," where women are more likely to publish in non-refereed venues (Fulkerson and Tushingham 2019; Tushingham et al. 2017) or present at conferences (Bardolph 2018; Bardolph and VanDerwarker 2016) rather than publishing in peer-reviewed journals, including regional journals (Bardolph 2014). This session highlights recent data-driven approaches to the issues of diversity and equity in archaeology publications and grants. Suggested topics for this session include demonstrated or recommended approaches to promoting diversity in submission rates; analyses or self-studies of submission demographics for grants or regional, national, or international journals (peer-reviewed or non-peer-reviewed); methodological complexities; and historical perspectives on inequities in the discipline.

**[145] Symposium • NORTHERN RIO GRANDE HISTORY: ROUTES AND ROOTS**

All human life is fashioned on-the-move, just as it is shaped by the commitments to situated places that emerge along the way. However, the relative value placed on routes versus roots—on trajectories and ways of moving versus localism and modes of emplacement—has varied substantially across historical time and cultural space. This session draws together six papers that examine how such value systems have developed over time in the northern Rio Grande valley of New Mexico, from the early foraging traditions of the Archaic, through the rise of Pueblo villages, and on to the arrival of Spanish settlers, Comanche raiders, and White counterculturalists. Drawing on a wealth of new archaeological evidence, we offer, in part, a novel account of the region's history. But at a broader level, we seek to clarify how the ongoing negotiation between routes and roots is itself a generative and defining process in the emergence and transformation of cultural traditions.

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

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

**[147] General Session • APPROACHES TO NEW WORLD COLONIALISM****[148] Symposium • SOCIAL ARCHAEOLOGY IN THE NORTH AND NORTH ATLANTIC (SANNA 3.0): INVESTIGATING THE SOCIAL LIVES OF NORTHERN THINGS**

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

**[149] Symposium • RECENT INNOVATIONS IN ECUADORIAN ARCHAEOLOGY**

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

**[150] Symposium • THE CURRENT STATE OF ARCHAEOLOGICAL RESEARCH ACROSS SOUTHEAST ASIA**

*(SPONSORED BY SOUTHEAST ASIAN ARCHAEOLOGY INTEREST GROUP)*

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

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

Coastal-focused narratives have dominated our understanding of the behavioral diversity seen in the Late Pleistocene and Holocene archaeological records of southern African during the past 20 years. However, these narratives tend to overlook the persistent presence of hunter-gatherers in diverse landscapes in the interior regions of the continent. Recent fieldwork and research demonstrates the presence of hunter-gatherers in montane, desert, semi-desert, grassland, and riverine environments from at least

the Late Pleistocene onward. This session will therefore bring together researchers working across the distinctive environments found within southern Africa to contribute toward a more cohesive understanding of hunter-gatherer landscape use in this region during the past 100,000 years. In this respect, rather than focusing on one biome as a source of innovation, this session will emphasize the presence of hunter-gatherers across southern Africa's diverse environments, and the connections and interactions across these landscapes, as a means to better approach an understanding of the past in this region.

**[152] General Session • CURRENT CLASSIC PERIOD LOWLAND MAYA RESEARCH**

**[153] Symposium • FEMALE FIRSTS: CELEBRATING ARCHAEOLOGY'S PIONEERING WOMEN ON THE 101ST ANNIVERSARY OF THE 19TH AMENDMENT**

*(SPONSORED BY HISTORY OF ARCHAEOLOGY INTEREST GROUP (HAIG))*

In recognition of the 101st anniversary of the ratification of the 19th Amendment, we celebrate other female firsts, specifically those of pioneering women in American archaeology and beyond. Although they gained the right to vote in 1920, women were not yet regularly allowed to participate on their own merit in American archaeology, with few exceptions. It wasn't until the mid-1920s that women were able to train beside men in graduate schools or field schools. During the 1930s the numbers of women doing fieldwork and completing MAs greatly increased, and during the 1940s and 1950s women had more access to earning PhDs. Despite these gains across the decades, women continued to experience lower pay grades, limitations on degrees obtained, and relegation to specific research niches. We focus on our predecessors who broke such barriers. These women, whether they were the first female PhDs in anthropology programs or female archaeologists of color, forged a path for others while also creating waves. Importantly, breaking barriers is not an artifact of the past; female archaeologists today, and certainly female archaeologists of color, continue to make strides in the field and achieve their own female firsts in the discipline.

**[154] Symposium • NEW PERSPECTIVES ON RITUAL VIOLENCE AND RELATED HUMAN BODY TREATMENTS IN ANCIENT MESOAMERICA**

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

**[155] General Session • FROM THE CLASSIC PERIOD TO THE POSTCLASSIC IN HIGHLAND MESOAMERICA**

**[156] Symposium • THINKING ABOUT EATING: THEORIZING FOODWAYS IN ARCHAEOLOGY**

In 1962, Claude Lévi-Strauss famously said that food is not only "good to eat" but also "good to think." Today, archaeological food studies are expanding and progressing in wonderful directions, illuminating past individuals and groups, their identities, meanings, and daily practices. In addition to the ever increasing number of technological strategies for investigating food in the past, there are a range of ways to approach and integrate the many datasets that can be harnessed to think about eating in the past, including approaches such as social, political, economic, nutritional, cooking technologies, material structuring, exchange routes, consumption patterns, and webs of meaning. Symposium participants will present a range of theoretical positions and approaches within food archaeology from across the globe, with specific focus on the use of multiple datasets. While the emphasis is on teasing out the social values and meaning structures of the patterns of food use, the most robust examples will also consider how food archaeologists can obtain a 3D view through multiple datasets to get closer to the daily lives of people gaining and eating food.

**[157] Symposium • INDIGENOUS STORIES OF THE INKA EMPIRE: LOCAL EXPERIENCES OF ANCIENT IMPERIALISM**

The interdisciplinary study of the Inka Empire has a long history. However, this scholarship is heavily informed by a robust body of ethnohistoric research that relies on Spanish-era documents mediated through Inka-centric narratives of expansion that sought to portray the empire as a civilizational mission that brought order and progress to previously chaotic lands. Currently, most studies that focus on provincial Inka archaeology tend to cast conquered societies as reactive to Inka policies rather than active agents with specific agendas. Furthermore, recent developments in historical archaeology show that local identities and practices outlived the Inka Empire. As such, in this session, we ask presenters to "flip the script" by focusing on how local communities resisted, accepted, and/or creatively appropriated "empire" into their historical trajectories. Specifically, presenters will focus on how local people actively engaged (or actively disengaged) with Inka imperial ideology, policies, and materials, rather than to detail how imperial demands changed local practice. By analyzing archaeological, historical, and ethnographic data from across the Andes, this session aims to complement and expand provincial scholarship by asking how non-Inka Andean communities experienced, performed, portrayed, and understood Inka expansion.

**[158] Symposium • THE SUBTERRANEAN IN MESOAMERICAN INDIGENOUS CULTURE AND BEYOND**

Mesoamerican cultures proclaim the central importance of landscape in both architecture and iconography as pyramids and temples

replicate hills and caves. These landscape features are magnets that attract people to them and structure activities around them. This session focuses on the subterranean and its influence on Indigenous culture in Mesoamerica and the Southwest. Subterranean features are particularly significant to archaeology in often holding purely ritual assemblages that represent the field's best context for studying the archaeology of religion.

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

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

**[160] Forum • WORRIED ABOUT FINDING WORK? HOW TO INTERVIEW, PREPARE RESUMES, AND WRITE TECHNICAL DOCUMENTS**

This forum provides an opportunity for undergraduate and graduate students to ask archaeologists of a variety of career paths and stages questions regarding how to prepare for an ever-increasingly competitive job environment. Focusing on industry and government work, come prepared with your queries regarding interviewing skills, writing resumes, and technical writing. If you have a resume you'd like us to review, or any specific questions, feel free to submit those to the moderators at [dwitt@buffalo.edu](mailto:dwitt@buffalo.edu) by April 3, 2021. We may not be able to address everyone's questions during the forum, but we welcome continued conversations after the session. There are no stupid questions, and we all started out at the same place you are!

**[161] Forum • TO THE ACADEMY AND BEYOND: A BIOARCHAEOLOGY JOBS FORUM**

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

**[162] Forum • TEACHING INTEGRITY IN EMPIRICAL ARCHAEOLOGY  
(SPONSORED BY OPEN SCIENCE IN ARCHAEOLOGY INTEREST GROUP)**

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

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

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

**[164] Forum • CONSTRUCTING CHRONOLOGIES III: WHERE DO WE GO FROM HERE?**

Bayesian approaches are now used by Europeanist archaeologists when they construct chronologies, and are increasingly being adopted by Americanists. Given the maturity of these methodologies, now seems like a perfect time to pause and reflect. For some, these techniques offer a powerful and coherent way to combine information from a range of sources, arriving at fully probabilistic chronologies from the data. For others, they are a collection of software tools, to be used as black-boxes, which seem to work relatively well in a range of situations. For most users, of course, they are a blend of the two. This forum will offer a chance to reflect on these perspectives and any others that are raised by the first two Constructing Chronologies sessions. We will start with a formal, curated discussion, focused around a series of big picture questions selected by the moderators and shared with invited discussants in advance. The discussants will include both users and developers of chronology construction tools and software, thus allowing for interactive discussion as well as pre-prepared statements. The second part of the session will be an open discussion, which will provide an opportunity for participants to ask questions or comment on constructing chronologies.

**[165] Forum • ARCHAEOLOGICAL APPROACHES TO ANTHROPOGENIC FIRE AND GLOBAL PYRODIVERSITY**

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

**[166] General Session • RELIGION, RITUAL, AND SPIRITUAL WORLDVIEW: CURRENT RESEARCH****[167] Symposium • WATER AND SANITATION MANAGEMENT IN THE MEDITERRANEAN**

As research into daily life, especially in lower status households, has increased in Mediterranean archaeology, focus on water and sanitation systems has developed more interest. The basic questions of how to manage waste and provide drinking water are human universals. In the Mediterranean this was answered with impressive engineering works to transport water from reliable sources, as well as to provide pressurized water for increasingly elaborate display features such as baths and fountains. In this session, we will examine recent advances that combine GIS and modern engineering with archaeological survey. Several of the papers to be presented are the result of collaborative research between Wright Paleohydrological Institute and the Pompeii Water and Sanitation Field School. Paper topics will include GIS analyses, explore the socioeconomic importance of displaying water features, trace Roman aqueducts, and compare of water fountains in the Bay of Naples.

**[168] General Session • TOPICS IN NEAR EASTERN AND SOUTHERN CAUCASUS ARCHAEOLOGY****[169] General Session • MATERIAL REMAINS: LOOKING AT ARTIFACTS IN MULTI-REGIONAL CONTEXTS****[170] General Session • APPLICATIONS OF PALEOETHNOBOTANY****[171] General Session • PRODUCTION AND TRADE: INSTRUMENTAL NEUTRON ACTIVATION ANALYSIS (INAA)****[172] Forum • TEACHING AND TRAINING IN GEOARCHAEOLOGY: PEDAGOGICAL METHODS AND CURRICULAR PATHWAYS**

*(SPONSORED BY GEOARCHAEOLOGY INTEREST GROUP)*

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

**[173] Symposium • BAYESIAN ARCHAEOLOGY**

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

Archaeologists and other scientists typically use statistical techniques to evaluate how well empirical evidence supports their hypotheses. Historically, null hypothesis significance testing (NHST) has been a frequently used framework to achieve this goal. Today's NHST methods underlie popular statistical concepts such as confidence intervals and probability statements (p-values). NHST employs those statistical concepts to make probabilistic statements about one's data in relation to a hypothesis. Although this approach is very useful, the fundamental concepts in NHST can often seem arbitrary and confusing. Archaeologists and other scientists have begun to incorporate Bayesian methods into their analyses. Leveraging the weight of prior and new evidence,

Bayesian inference empowers scientists to assign probabilities to competing hypotheses for comparison and enables their revision in light of new information (NHST does not). The Bayesian approach offers an alternative and, in some respects, improved statistical framework over NHST that is now practically approachable thanks to modern computing methods. This symposium aims to highlight the creative and diverse employment of Bayesian inference by archaeologists and illuminate its structure, procedures, and accessibility, featuring the benefits of its implementation and replicability to archaeological research.

#### **[174] General Session • ANALYSES, SURVEY, AND DIGITAL ARCHAEOLOGY ACROSS EUROPE**

##### **[175] Symposium • LIFE IS RISKY: HUMAN BEHAVIORAL ECOLOGICAL APPROACHES TO VARIABLE OUTCOMES**

Every human decision involves an aspect of risk. As such, it is critically important that anthropologists develop a general framework for defining and explaining risk-sensitive behavior. Human behavioral ecology (HBE) has long been interested in understanding the conditions under which individuals should be risk-averse, risk-prone, or risk-indifferent. HBE has made great strides in risk-oriented research by formally defining risk as probabilistic variance and seeking to explain risk-preferences from an explicit cost/benefit framework. Nonetheless, the last attempt to synthesize an HBE approach to risk was Elizabeth Cashdan's landmark edited volume "Risk and Uncertainty in Tribal and Peasant Economies" published in 1991. We believe, 30 years later, it is time again to synthesize HBE approaches to risk. This organized session will highlight current archaeological investigations into risk. Our goal is to provide an explicit—and hopefully consistent—HBE framework for understanding risk and to discuss the ways in which risk-sensitive research has changed over the last several decades.

##### **[176] Symposium • ARCHAEOACOUSTICS: SOUND, HEARING, AND EXPERIENCE IN ARCHAEOLOGY**

Sound has always been an omnipresent component of human experience, and recent trends in archaeological inquiry seek to explore the importance of acoustics, instruments, and what was heard in the past. More than a mere channel of communication, sounds, performances, and music conferred connotations of power, contributed to the formation of identities, and were an important part of all activities, including recreation, aesthetics, and ritual praxis. This session presents case studies in applied archaeoacoustics, psychoacoustics, soundscapes, and archaeomusicology from a variety of scales and cultural perspectives. Defined by Scullin and Boyd (2014:363), soundscapes consist of "all sounds present in any given environment and how these sounds interact within that environment." Here, we consider a variety of archaeoacoustical topics, including discussions of natural and anthropogenic places that affect the propagation of sound waves; the sonorous landscape; speech intelligibility; theoretical, psychological, and cognitive sonic studies; the conservation and promotion of auditory heritage; and studies of instruments used to produce music and/or signals.

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

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

##### **[178] Symposium • ADVANCES AND NEW PERSPECTIVES IN THE ISTHMO-COLOMBIAN AREA**

The modern territories of eastern Honduras, eastern Nicaragua, Costa Rica, Panama, and Colombia are included within the concept of the Isthmo-Colombian area. For a long time, its prehistory was relegated to a marginal status as an "Intermediate Area" or as a "Periphery of Mesoamerica," which led to a relative inattention to archaeological research and exploration of theoretical and methodological issues in the area. These initial concepts failed to capture the diverse array of cultural expressions that dotted the Isthmian landscape. New and exciting research in the area currently demonstrates how the region has potential to explore major issues such as the development of complexity, the emergence of pottery and agriculture, the cultural contexts for the development of lapidary work and metalworking, paleoenvironmental reconstruction and human ecology, human responses to natural disasters, and the dynamics of interaction and migration. This session brings together contributions from the recent research by archaeologists from Costa Rica, Panama, Colombia, the United States, and Europe, whose investigations include novel methodologies and theoretical frames to explore new and ongoing anthropological questions.

##### **[179] Symposium • ARCTIC PASTS: DIMENSIONS OF CHANGE**

The rich and dynamic culture histories of Arctic peoples have for many years been the focus of significant attention, ranging from community-based studies of Inuit Qaujimajatuqangit (Inuit traditional knowledge) to archaeological research. Many of these efforts highlight resilience in the face of social and environmental change. In a similar vein, due in part to the relatively sensitive nature of its biogeography, the Arctic is often viewed as a region in which the effects of climatic change can be understood in new and profound ways. Even the ways in which Arctic archaeologists do their work are changing for the better. Close partnerships with Indigenous individuals and communities, as well as new theoretical perspectives and methodologies—including those adopted from other fields—are contributing to exciting inter-, multi-, and transdisciplinary research, from studies on materiality and the relationships between humans and nonhuman animals, to Indigenous-focused approaches centered on traditional knowledge. In



this symposium, we present a diverse cross section of archaeological and related work currently being carried out across the Arctic that deals in some way with the idea of change.

**[180] Symposium • POLYCHROMY, MULTIMEDIALITY, AND VISUAL COMPLEXITY IN MESOAMERICAN ART**

This session aims to explore polychromy, multimodality, and other forms of visual complexity in Mesoamerican art. A recent body of scholarship has demonstrated that the choice of certain materials and their subtle assemblage, as well as the manufacture of artworks with particularly complex formal features, convey values and meanings of crucial relevance for the societies that created them, while also providing fresh understanding of Indigenous concepts of artistic creation(s). Most of these studies fruitfully conjoin analysis of artifacts or artistic corpuses with the study of historical documents, especially those written in Indigenous languages, in order to provide an emic approach to Mesoamerican aesthetics. Building on these works thematically and methodologically, this session will discuss individual artworks and widespread artistic traditions that generate insights into artists' approaches to cultivating visual complexity—encompassing the use of color, multiple materials, and strategies of design—in Mesoamerican art of different genres and historical periods, in order to better understand their purposes and meanings within specific cultural contexts. Broadening the discussion beyond the widespread focus in the existing scholarship on historical Nahua art, this panel will seek to broaden the discussion by including presentations that tackle other cultural traditions or that incorporate ethnographic approaches.

**[181] Symposium • THE URBAN QUESTION: INTERDISCIPLINARY APPROACHES TO INVESTIGATING THE ANCIENT MESOAMERICAN CITY**

Urbanism and architecture in Mesoamerica have been the subject of intense investigations; however, there is still much to learn surrounding the various trajectories leading to city development, functioning, and sustainability. The extreme variability of precolumbian Mesoamerican settlements in terms of configuration and nucleation makes it often impossible to identify the city edges and reconstruct its gradual development. Because cities are dynamic, they require dynamic programs of investigation that address the urban experience as multiscalar, nonlinear, and materially rich. This session proposes a multidisciplinary and multiscalar approach to the consideration of the history of urban development in Mesoamerica, from the individual event, to the household and finally the urban scale. That approach, including both micro and macro methods, spatial analyses, and digital archaeological techniques presents an opportunity to investigate the relationship between the Mesoamerican city and its gradual expansion to its inhabitants, in terms of population scale with respect to infrastructure for people's daily movement, living, and interaction. With the papers presented here, we aim to contribute to a comprehensive theoretical and methodological approach to Mesoamerican urban studies that attends to the city as the result of intertwined social, economic, political, practical, and worldview related processes.

**[182] General Session • ANDEAN ARCHAEOLOGY FROM THE MIDDLE THROUGH LATE HORIZONS**

**[183] Symposium • NAVIGATING ETHICAL AND LEGAL QUANDARIES IN MODERN ARCHAEOLOGICAL CURATION**

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

**[184] General Session • HISTORIC ARCHAEOLOGY OF NORTH AMERICA**

**[185] Lightning Rounds • AN OCEAN OF CONNECTIONS: TANGIBLE AND INTANGIBLE EXCHANGES IN THE IOW**

The Indian Ocean has never been a barrier, but an area for connections between different continents, entities, and cultures, where tangible commodities and intangible knowledge were being exchanged for millennia. Taking into consideration all periods, how have the mobility and networks within Mare Indicum impacted its people, societies, cultures? This Lightning Round explores the ways in which the Indian Ocean increased its global importance over time. In doing so, it offers space to present novel archaeological research and to assess its significance for broader academic debates on the agency, structure, connectivity, and cultural fluidity of this area. The region's vastness and the complexity of its interaction patterns should encourage discussions contributing to modern archaeological research and provide an understanding of a degree of networks that existed within the Indian Ocean World. We are interested in interdisciplinary approaches applied to discoveries on land and underwater, which allow us to discuss numerous topics, including (but not limited to) the complexity of trade routes and the emergence of cross-cultural knowledge versus social conflicts. Our goal is not only to bring together a diverse group of early-career scholars but also to create an inspiring space in which to tackle Indian Ocean archaeology.

**[186] Symposium • AFRO-LATIN AMERICAN LANDSCAPES  
(SPONSORED BY AFRO-LATIN AMERICA INTEREST GROUP)**

This session will explore Afro-Latin American landscapes of varying scales and meanings. Ways of place making were contingent

and strategic and emphasized to different degrees sharp distinctions, ambiguity, or seamless inclusion. Archaeological understanding of these endeavors elucidates a spectrum of social, political, and economic dynamics during the colonial period that formed the foundation for defining fledgling Latin American nation-states and continue to inform current struggles for land rights. Case studies demonstrate that Afrodescendants have made an enduring contribution to the formation and maintenance of Latin America and the Caribbean. Archaeological examples show numerous ways that Afro-Latin Americans came to “belong” to a place. For example, some Afro-Latin American religious beliefs and practices recognized the innate power of certain kinds of landscapes. The co-creation and shaping of landscapes by both Indigenous and Afrodescendant actors shows up in alterations of terrain, new ecologies, and distinctive spatial and material environments. The papers in this session will offer diverse perspectives of how Afro-Latin Americans have and continue to make a place for themselves.

**[187] Symposium • "IS THERE GOLD IN THAT FIELD?" CRM AND PUBLIC OUTREACH ON THE FRONT LINES**  
(SPONSORED BY PUBLIC ARCHAEOLOGY INTEREST GROUP)

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

**[188] Forum • A HOLE IN THE FIELD: ANCIENT MAYA STORAGE TECHNOLOGY**

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

**[189] General Session • MAYA EXPRESSIONS, RESISTANCE, AND LANDSCAPES**

**[190] Forum • DIVERSE EXPERTISE: ON THE IMPORTANCE OF MULTIVOCALITY AND INCLUSION IN ARCHAEOLOGY**  
(SPONSORED BY QAIG, COSWA)

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

**[191] General Session • CURRENT RESEARCH IN MEDITERRANEAN ARCHAEOLOGY**

**[192] General Session • ROCKY MOUNTAIN ARCHAEOLOGY AND CURATION**

**[193] General Session • HERITAGE AND EDUCATION: NARRATIVES AND COUNTERNARRATIVES**

**[194] General Session • INNOVATIVE RESEARCH IN GEOSPATIAL ANALYSES**

**[195] General Session • CURRENT RESEARCH IN DIGITAL ARCHAEOLOGY: SIMULATIONS AND MODELING**

NOTES: When you are logged on to the annual meeting online website, you will be able to search for individual presentations by person's name in the Presenters tab or by finding the list of presentations in each session by searching from the Agenda tab for the Session Title that corresponds to the session number (e.g., [19]) as it appears in the Final Program and the Symposium Abstracts. Session Titles are only searchable by the day of the event, which you can discern from the Final Program.

Presentations and posters that were officially withdrawn by March 31, 2021, but after the online meeting site was launched, have been marked as [WITHDRAWN] in the Final Program and Individual Abstracts; however, these presentation/poster placeholders will still appear on the meeting website.

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

## Participants-Individual Abstracts

### Abell-Selby, Emma (San Francisco State University)

[19]

*Spaces of Control: Medical Practices within the US Army (1890–1950)*

Using Giddens's agency theory, this research explores self-care and institutional care practices in the US Army. This project examines medical and personal care items discarded by US soldiers from Bldg. 104 of the San Francisco Presidio from 1890 to 1950. Artifacts include items such as bottles (e.g., alcohol, medicine, and soda), razors, toothpaste, floss, chewing gum, health-related advertisements and pamphlets, cigarette packaging, and Kellogg's Corn flakes. Methods include cataloging and analyzing artifacts, conducting archival research at the Golden Gate National Recreation Area, as well as examining primary and secondary source documents. This research investigates how soldiers were able to maintain spaces of control while complying with the rules and regulations of the US Army. The US Army provided soldiers with structure, safety, and purpose. Prior to 1890, health and preventative medicine were becoming of great interest to the US Army because of the outbreak of Cholera in the 1850s. In order to ensure the health and well-being of the troops, the US Army took great lengths to educate military personnel on the dangers of illicit sexual activity and consumption of alcohol. Moreover, the items discarded in Bldg. 104 represents the quotidian of the US Army.

Abrego, Alejandra [10] see Hertfelder, Paula

Acabado, Stephen [147] see Rodning, Christopher

Acebo, Nathan [42] see Tomczyk, Weronika

Acero, Erick [118] see Bazán Pérez, Augusto

### Achim, Miruna (Universidad Autónoma Metropolitana)

[180]

*Chalchihuites: Jade Histories of Value and Matter in the Early Modern World*

A well-known passage in the Florentine Codex offers a natural history of *chalchihuitl*: its revelation to a few "knowledgeable ones" by the vapor it exudes from underground when viewed against the sun's first rays; its varieties of green, luminosity, and hardness; the lapidary methods that bring out its brightness and color, materializing it as an object of social, economic, and religious value.

*Chalchihuites*—translated as greenstones, jasper, and jade—were among the first substances to cross the Atlantic, with other bright matters, like gold and featherwork. Unlike these other materials, which had immediate aesthetic or economic appeal, *chalchihuites* occupied a marginal space in early modern European regimens of wonder and value. This paper reconstructs the early modern epistemic, cultural, and sensuous spaces where *chalchihuites* circulated, side-by-side with Chinese *yu* (via Jesuit missions in Asia) and Amazonian *muiraquitães*. It explores European and Chinese conceptions (of color, light, and agency) and practices associated with minerals to reconstruct the transformation of *chalchihuites* into materia medica. Reflecting on the limits of translation, it explores how sense and sensory experience are contingent upon overlapping systems of symbolic and technological activity.

Acuña-Alonzo, Víctor [55] see Contreras-Sieck, Miguel

Adams, Aron [100] see Stephens Reed, Lori

### Adams, Christopher (Gila National Forest Archaeologist)

[37]

*Prehispanic Copper Artifacts Found in the Gila National Forest*

The discovery of a prehispanic copper artifact on a Classic Mimbres site in the Gila National Forest in southwestern New Mexico in

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

**Adams, Jenny (Desert Archaeology Inc., retired)**

[79]

*Discussant*

Adams, Manda [29] see Heidkamp, Blair

**Adler, Michael (Southern Methodist University)**

[19]

*A Cache of Colonial Period Religious Medallions from Picuris Pueblo, New Mexico*

In May 1988, reconstruction activity at the historic mission church at Picuris Pueblo by community members found a small stone box covered with a mano (grinding stone) and containing 27 items, including 18 religious medallions, four metal crucifixes, three crucifixes with inset glass beads, and three thin metal rings. This paper considers the origins and potential meanings of this ritual cache given the long history of pre- and postcontact burial of traditional ritual items at Picuris Pueblo and other Northern Rio Grande pueblo communities.

Adler, Michael [145] see Boulanger, Matthew

Adler, Michael [145] see Montgomery, Lindsay

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

[169]

*Fifty Years with Baskets*

The year 2020 marks the 50th anniversary of my first publication on prehistoric basketry. Over the past half century, the field of perishable artifact analysis has evolved dramatically. Though this evolution has not resulted in a geometric increase in the number of practitioners of this still arcane specialty, it has witnessed numerous transformations and enhancements of focus. After 50 years and literally hundreds of publications, papers, and other perishable platitudes, my fundamental "message" continues to follow Welfish's original observation that basketry is valuable as a medium for comparative study from multiple points of view because "the mechanical factors involved in the technical process objectify themselves in the product and are not lost in the process of making" (Welfish 1932:108). This contribution summarizes some of the major developments in the arena of basketry studies and, more broadly, in the field of perishable artifact analysis at large.

Adovasio, J. M. [17] see Freund, Kyle

Aguilar, Rebeca [82] see Frykholm, Soren

Agurcia Fasquelle, Ricardo [89] see Pineda de Carias, Maria-Cristina

**Ahern, Kaitlin (University at Buffalo)**

[96]

*An Analysis of Lime Plaster Floor Samples from the Holmul Region, Guatemala*

During the summers of 2018 and 2019, the author collected 19 lime plaster floor samples from the ancient Maya sites of Cival, Holmul, and Witzna. These three sites are located in the Holmul region, which is situated in the Petén along the border with Guatemala and Belize. The majority of the plaster samples were collected during the Holmul Archaeological Project's 2018 field seasons at Holmul and Witzna. These plaster samples were analyzed via thin-section analysis, SEM-EDS, and pXRF to determine their elemental and chemical composition. Comparative analysis was conducted to identify variations in the floor samples and to provide insight into the interactions between these three centers. Particular emphasis was placed on identifying the practices involved in the selection of raw materials and the production of plaster.

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

[32]

*The 2019–2020 NSF REU Exploring Globalization through Archaeology Investigations on St. Eustatius, Dutch Caribbean*

The second year of the National Science Foundation (NSF) Research Experiences for Undergraduates (REU) Exploring Globalization through Archaeology project included archaeological investigations of the sugar works site (SE095), bioarchaeological investigations of an eighteenth-century cemetery (SE600), and geophysical survey of the SE095 slave village, SE127/410 Lazaretto area, and two cemeteries. The various projects allowed the NSF REU students the opportunity to undertake a wide variety of

research projects. The posters in this session exemplify this diversity and the broad range of research undertaken by the NSF REU researchers. This poster presents an overall picture of the 2019–2020 session to introduce the overall project as well as highlight the student research.

[32]

Chair

Ahlman, Todd [32] see Black, Reece  
 Ahlman, Todd [32] see Bowden, Taylor  
 Ahlman, Todd [32] see Duncan, Joshua  
 Ahlman, Todd [32] see Fields, Mara  
 Ahlman, Todd [32] see Siegert, Courtney

**Aimers, Jim (SUNY Geneseo)**

[188]

Discussant

**Aiuvalasit, Michael (Illinois State Archaeological Survey, University of Illinois)**

[113]

Discussant

Ajú, Gloria [104] see Arroyo, Barbara

**Alaica, Aleksa (University of Toronto)**

[69]

*Coastal-Highland Interactions at the End of Moche: Investigating Vertical and Horizontal Archipelagos as Reflected in Pastoral Strategies in the Cañoncillo Region, Peru*

Archaeologists have conducted important work on long-distance interactions during the Middle Horizon of the south-central Andes (Bélisle et al. 2020; Castillo et al. 2012; Jennings 2010). Camelid herding provided a critical means of exchange along both horizontal and vertical archipelagos facilitating the movement of Cajamarca, Wari, and Moche goods to principal ceremonial-administrative centers during Late Moche period. Isotopic studies that reveal the prevalence of camelids from nonlocal origin demonstrating that foreign herders and delegates were traveling long distances to engage in economic transactions and political negotiations. At the Middle Horizon sites of Huaca Colorada and Tecapa, we have documented evidence of Cajamarca fineware yet limited access to Wari style ceramics. The faunal assemblages from these sites further demonstrate the continued importance of feasting during the Late Moche–Transitional phase. However, despite such continuities, elites maintained greater access to nonlocal camelids that may have arrived from the northern and southern highlands. Despite a lack of dense Wari related material culture in the southern Jequetepeque Valley, I argue that the consistent interaction between Moche elites and delegates from Cajamarca suggest camelids enabled exchange relations that underwrote highland patronage and even cooption of Moche huacas in the late Middle Horizon (Spence-Morrow 2019; Swenson 2012).

Alaica, Aleksa [45] see Scaffidi, Beth  
 Alaica, Aleksa [129] see Warner, Jacob

**Aland, Amanda (Collin College)**

[157]

*Interpreting Inka: Local Perspectives from Santa Rita B (Chao Valley, Peru)*

Archaeological investigations of Inka sites often focus on the presence or quantity of Inka materials as a way of determining the degree of imperial domination. While such analyses may work well in heartland sites with visible Inka materials having a clear imperial connection, in many provincial regions we need to address the role of local communities and their interpretation and implementation of the imperial agenda. One area that allows for such examinations is the north coast of Peru, which was subject to successive waves of imperial expansion from about AD 1350 to the mid-sixteenth century. The Chao Valley, sequentially annexed by the Chimú, Inka, and Spanish Empires, offers perspectives on how local populations managed successive waves of imperial expansion. This paper discusses the evidence from Santa Rita B, a lower-order site in the Chao Valley, which suggests that while local identities and daily life were profoundly altered following Chimú conquest, the community's experience following Inka incorporation was quite different. While material manifestations of Inka imperial power are limited at Santa Rita B, their nature and contexts suggest that life of the local community was formed by local choices and actions as much as by imperial policies and ideology.

Alaniz, Alfred [143] see Perez, Gary

**Alberti, Benjamin (Framingham State University)**

[145]

*Images on the Move: Archaic Rock Art of Northern New Mexico*

Archaic foragers represent one extreme of the relationship between routes and roots. There is a wealth of evidence in the US Southwest of the itinerant, ambulatory lifeways of ancient populations—impermanent campsites, lithic scatters near likely animal

trails and watering holes, and the enigmatic rock art that appears along watercourses or beside points of access through rugged terrain. What remains most visible to us are the concentrations of this art; much more so than the relatively ephemeral remains of habitation or passage. Were these special places, their walls and outcrops endowed with some extraordinary meaning through the engraved artworks? Or did significance already reside there? Clues to the answers to these questions are provided by the images themselves: sinewy patterns of grids and nets, alongside bodies known only by their absence—footprints, handprints, animal prints. In this paper, I argue that the logic of the image was intimately connected to hunting—the same logic that drove the hunt, compelled from the artist a certain kind of engagement with the rock. The apparent fixity of the sites is illusory; far from static subjects for their hammerstones, places and the images that made them were always on the move.

Albuquerque, Ricardo [69] see Cusicanqui, Solsiré

**Alcántara, Rosa (INAH) and Sandra Santiago (INAH)**

[155]

*Archaeological Research in the Historical Center of Xochimilco*

One of the fundamental tasks of archaeology in Mexico is to investigate, conserve, restore, and recover archaeological monuments; likewise, it is interested in disseminating its studies, for this reason, the results of the analysis of the prehispanic materials found during an archaeological rescue that took place in the historical center of Xochimilco, in the years 2016 and 2019, coordinated by the Direction of Archaeological Rescue (DSA) of the National Institute of Anthropology and History (INAH). The investigation considers a comprehensive analysis of human and animal bone remains and ceramic, lithic, and to a lesser extent malacological elements, dated during the late Postclassic period (AD 1200–1521). Specifically, it is based on a bioarchaeological study of seven individuals, two of which correspond to young female adults with an estimated age of 22–36 years. Meanwhile, the remaining individuals belong to five infants. The purpose is to understand and give an explanation to the society and its lake lifestyle of the ancient lake of Xochimilco.

**Alconini, Sonia (University of Virginia)**

[111]

*Discussant*

**Alconini, Sonia (University of Virginia)**

[157]

*Discussant*

**Aldana, Gerardo (University of California, Santa Barbara), Marcus Thomson (University of California, Santa Barbara), Thomas Thelen (University of California, Santa Barbara) and Toni Gonzalez (University of California, Santa Barbara)**

[100]

*SeibalSim: Toward Modeling Communities (Not Populations) of Early Formative Mesoamerica*

In “The Forms of Capital,” Pierre Bourdieu writes, “The social world is accumulated history, and if it is not to be reduced to a discontinuous series of instantaneous mechanical equilibria between agents who are treated as interchangeable particles, one must reintroduce into it the notion of capital and with it, accumulation and all its effects.” His attempt was to get away from oversimplifications of community interactions in efforts to represent and then make use of the representations of anthropologically studied communities. In archaeology, however, it is still common practice to make use of precisely the kinds of reductionistic models that Bourdieu criticizes in creating representations of human population interactions with their environments. Through object-oriented programming and agent-based modeling, we have constructed a simulator for exploring village interactions of Early Formative period Mesoamerica. In this paper, we present preliminary results of our efforts to incorporate a Bourdieu-inspired critique into villager: an in-house R library for simulating ancient villages.

**Alday, Camila**

[114]

*Bast Fiber Technology in the West Coast of South America: A Study of the Early Coastal Hunter-Gatherer's Fiber Production*

This study presents the results of an archaeobotanical analysis of the hunter-gatherer's plant-fiber technologies of South America's west coast. Due to the extreme aridity of the Atacama Desert, the preservation of organic technologies is exceptional. I analyze a unique assemblage of nets, looped bags, twinned mats, fiber skirts, and cordages dating to ca. 10,000–3500 BP (Preceramic period). In doing so, I identify the use of aquatic plants (Typhaceae and Cyperaceae) and a dogbane plant (Apocynaceae) in the production of artifacts. I investigate loci of the fiber production, particularly wetlands and dry forest relics, which furnished critical sources of bast fibers. Furthermore, I argue that gathered wild plants underpinned the production of critical artifacts that sustained maritime subsistence strategies during the Preceramic period. Finally, I present a dance metaphor to analyze the Preceramic plant-fiber technology. In this metaphor, the seasons and the ecology of the wetlands and dry forest somewhat dictated the itinerary of the artisans' movements. Together, temporal and spatial dimensions of the plant-fiber technology merged with marine foraging activities, turning the Pacific littoral into a social, ecological, and technological landscape of animate actions.

**Alders, Wolfgang (University of California, Berkeley)**

[47]

*Long-Term Settlement in Plantation Regions of Unguja, Zanzibar*

In this paper, I discuss the results of an archaeological survey conducted in 2019 in north-central Unguja, Zanzibar. The aim of the

survey was to investigate the long-term settlement history of regions that were transformed in the nineteenth century by Omani landowners who developed an agricultural export economy using a labor force of enslaved East Africans. The project investigated how the clove plantation economy in Zanzibar developed in relation to deep histories of Swahili land use and settlement on the island, away from the late first millennium and early to mid-second millennium Swahili sites that lie directly on the coast. Using both judgmental and random stratified shovel test pit surveys across different environments, the project characterized the general settlement history of the region from the earliest period of occupation to the development of clove plantations in the nineteenth and early twentieth centuries. Results from the survey suggest a phase of occupation in the interior around perennial streams and good soil from the eleventh to fifteenth centuries, followed by a dramatic expansion of small field house and hamlet sites in the late second millennium.

[47]

*Chair*

**Alders, Wolfgang (University of California, Berkeley)**

[185]

*Discussant*

**Alexander, Rani (New Mexico State University)**

[59]

*Landscapes of Inequality in Ebtun, Yucatán, 1800–1890*

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

**Alexandrino Ocaña, Grace (Stanford University)**

[90]

*Civic Society Groups, Cultural Rights, and Rights to a “Heritage” City during COVID-19*

In an archaeologically rich country like Peru, theoretically all people have access to archaeological sites. However, parallel to the COVID-19 pandemic, vulnerable and traditionally marginalized populations are disproportionately affected by archaeological sites (as well as by coronavirus). This presentation asks: What has changed in the conservation of archaeological sites in metropolitan Lima since the beginning of the COVID-19 pandemic? Archaeological conservation in Peru still predominately views the absence of social use as beneficial for site preservation. However, since 2008 low-income/working-class heritage civil society groups have become increasingly important in protecting sites even as they make new claims for rights to the city and their local patrimony. My ethnographic research shows that the absence of these groups during Peru's mandatory quarantine has actually had detrimental effects on urban archaeological sites.

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

[9]

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

The semiarid region of Northern Chile (29°–32° S) is a transitional ecological area, located between the extreme hyperarid conditions of the Atacama Desert and the Mediterranean ones of Central Chile, with a long history of human occupation (Archaic period–Late period). This study evaluates the stable isotope signatures,  $\delta^{13}\text{C}_{\text{ap}}$ ,  $\delta^{13}\text{C}_{\text{col}}$ , and  $\delta^{15}\text{N}$ , of individuals from the coast and inland for the entire temporal sequence. Among coastal groups, marine resources are central throughout the prehistory of the region but  $\delta^{15}\text{N}$  decreases over time. In contrast,  $\delta^{13}\text{C}$  increases over time. In the inland,  $\delta^{15}\text{N}$  levels remain stable, while  $\delta^{13}\text{C}$  increases. Among coastal groups there is a higher degree of diversity in  $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}_{\text{col}}$  during the Middle period, and in  $\delta^{13}\text{C}_{\text{ap}}$  during the Late period. Among inland groups variability in  $\delta^{13}\text{C}$  is highest during the Early Ceramic period, whereas  $\delta^{15}\text{N}$  is most variable during the Late Intermediate period. Overall, the results indicate a late introduction of  $\text{C}_4$  plants both in the inland and along the coast, and a dietary variation that although limited, likely emerged from differences in preferences, access, mobility, and the changing meaning of foods.

**Alix, Claire (Université Paris 1 Panthéon-Sorbonne), Anthony Krus (University of South Dakota), Lauren Norman (University of Kansas), Owen Mason (INSTAAR, University of Colorado) and Juliette Taieb (ArScAn [Archéologies environnementales])**

[179]

*The Birnirk to Thule Transition as Viewed from Two Adjacent Houses at Cape Espenberg*

The transformation of the Birnirk culture into the Thule culture remains central to the development of modern Inuit peoples across the Arctic. Nevertheless, its chronological definition remains imprecise and contentious despite a century of research since the discovery of the Birnirk site near Utqiagvik and the definition of the Thule culture in the central Canadian Arctic. Despite 30 years of efforts to increase radiocarbon dating, refined chronologies established by AMS radiocarbon dates from samples within well-defined

contexts have been insufficient to precisely date the cultural components preceding Thule Inuit and the emergence and expansion of early Thule. In this paper, we examine the Birnirk-Thule transition through the radiocarbon, tree-ring dating, and Bayesian chronological modeling from two dwellings only 25 m apart on the Cape Espenberg Rising Whale site (KTZ-304) at the entrance of Kotzebue Sound in northwestern Alaska. A series of 50 radiocarbon and 15 tree-ring dates indicate the two houses—respectively containing a Late Birnirk and an early Thule component—were not contemporaneous and that each was likely occupied for around one to two human generations. Our analysis places the Birnirk to Thule transition in the mid-thirteenth century AD.

Alix, Claire [179] see Taieb, Juliette

**Allgaier, Paul (University of Utah Archaeological Center), D. Craig Young (Far Western Anthropological Research Group Inc.), David Zeanah (California State University, Sacramento), Robert Elston (University of Nevada, Reno) and Brian Coddington (University of Utah)**

[39]

*Paleoindian Settlement of the Central Great Basin: Testing Environmental, Radiocarbon, and Lithic Proxies with Data from Grass Valley, Nevada*

Explaining Paleoindian settlement decisions in the Central Great Basin remains an important though controversial topic. Unfortunately, the limited archaeological and paleoenvironmental records from the region make progress on this issue challenging. To help address some of the problems of limited data in order to better understand Paleoindian settlement, we apply recently collected, high-resolution data from Grass Valley, Nevada, to a multilevel model that couples site locations with paleoenvironmental proxies. Our strategy is to model three overlapping populations: (1) Grass Valley's direct radiocarbon-dated Paleoindian sites, (2) Grass Valley's indirect lithic-dated Paleoindian sites, and (3) the Central Great Basin's direct radiocarbon-dated Paleoindian sites. We then compare these results to the broader settlement pattern across the Great Basin to determine if settlement decisions are structured by similar environmental factors.

Allgaier, Paul [39] see Contreras, Daniel

Alligood, Nekole [109] see Thompson, Christine

**Allison, Nathan (Stockbridge-Munsee Community Tribal Historic Preservation Office)**

[160]

*Discussant*

**Almeida, Ana**

[108]

*The Lure of the Sea: Objects and Behaviors*

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

**Alonzi, Elise (University College Dublin) and Barra O'Donnabhain (University College Cork)**

[67]

*Vows and Violence: Identities Enacted through Diet and Trauma at the Late Medieval Tintern Abbey, Ireland*

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

[67]

*Chair*

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

[49]

*Archaeological Synthesis and CRM: An Odd Couple?*

According to the SRI Foundation, CRM accounted for 93% of the \$367 million total expenditures on archaeological research in the US in FY 2020. While the percentage varies by country, I suspect that this trend holds worldwide. CRM research emphasizes field documentation and project interpretation. While individual archaeologists may wish to use CRM data from multiple projects to study



broader aspects of the past, there is no outcry from the public pressing for synthetic research and thus little incentive for agencies to fund such research. I argue that the status quo is short-sighted and ultimately not in the best interest of the public or CRM. Contemporary society faces challenges on all sides—climate change, inequality, migration, food security, etc.—which demand long-term perspectives on underlying social dynamics that can only come from the archaeological record. As threats to heritage resources multiply, CRM's project-by-project focus will become unsustainable. Regional or landscape-scale management solutions will follow, based on newly developed tools that allow the integration of results across projects. Future synthetic research in archaeology will increasingly rely on CRM results, and CRM will increasingly look to synthetic research to provide evidence-based results to base management decisions.

Alva, Jose [118] see Bazán Pérez, Augusto

Alvarado-Gonzalez, Alejandro [55] see Contreras-Sieck, Miguel

Alvarez-White, Maria Cecilia [133] see Katz, Monica

**Amador, Julio (UNAM) and Ofelia Márquez Huitzil (Independent Researcher)**  
[119]

*The Chalcatzingo Reliefs Seen from a Critical Perspective*

This paper is dedicated to carrying out a detailed study of some of the reliefs that were carved on the slopes of Cerro Chalcatzingo, during the Middle Formative period, as well as to present some critical reflections about the interpretations that have been made by other authors. All descriptions imply interpretation, in consequence, every process of perception and theoretical construction embodies a framework of thought that is determined historically and culturally. We have observed that between the interpreters of the reliefs, a dominating preconception determines their process of observation and the formulation of their hypothesis, something that we have made explicit in our critique. We have dedicated ourselves to contextualize the reliefs and the interpretations, and have also contrasted the zoomorphic images of the reliefs with the living animals that may have inspired them, as well as with their representations in several codices, in order to accomplish more precise descriptions and interpretations, founded more solidly.

Amaral, Márcio [66] see Rocha, Bruna

**Amaroli, Paul (Fundación Nacional de Arqueología de El Salvador)**  
[132]

*Classic through Postclassic in El Salvador*

Beginning with the first formal archaeological studies nearly a century ago, findings in the territory of El Salvador have been recognized as attesting to the establishment of Nahua migrants. This has commonly been interpreted, in conjunction with ethnohistoric accounts, as resulting from a single episode of what has been termed a "Toltec diaspora" of migrants originating in central Mexico or the Gulf Coast during the Early Postclassic, whose linear descendants were the contact period Nahua of Escuintla, Cuscatlán, and Pacific Nicaragua. Here the Terminal Classic through Early Postclassic in the territory of El Salvador is reexamined. It is argued that present evidence does not lend itself to supporting a single Nahua migration, but rather corroborates greater complexity regarding this issue.

Amati, Anne [25] see Lofaro, Ellen

**Ambrose, Stanley (University of Illinois, Urbana-Champaign) and Andrew Zipkin (Arizona State University)**  
[96]

*Implications of Ostrich Eggshell Diagenesis Experiments and Observations for Isoscape Analyses*

Ostrich eggshell (OES) is widely used for environmental reconstruction with carbon, oxygen and nitrogen isotopes, and radiocarbon dating. Strontium isotope ratios of OES artifacts can be used to reconstruct object biography, human mobility, and interaction networks. OES can provide an isotopic baseline for reconstructing past environments and provenience of artifacts only if diagenetic contamination of archaeological eggshell can be excluded. OES has two main structural layers with different diagenetic susceptibilities. The palisade (outer) layer is micritic calcite with 1%–2% organic matter. It absorbs large amounts of uranium after burial. Its oxygen and carbon isotope ratios decrease systematically above 350°C. The mammillary/cone (inner) layer comprises small translucent columnar calcite crystals. It does not absorb organic staining solutions, uptakes ~100–1,000 times less uranium, and does not shift isotope ratios at 450°C. Porous calcite covering the organic-rich cone tips should be removed before sampling. <sup>87</sup>Sr/<sup>86</sup>Sr of inner and outer layers in the same specimen differ substantially in surface-collected modern OES from Kenya and archaeological OES from Malawi, likely due to uptake of soil Sr by the palisade layer. Results of analyses of cone layer crystals decontamination by acid-etching will be presented. This method can insure accurate elemental and isotopic analyses of OES.

**Ames, Christine (DC Historic Preservation Office) and Ruth Troccoli (DC Historic Preservation Office)**  
[187]

*Gold Is in the Eye of the Beholder: Public Outreach and Education in Washington, DC*

Archaeological review and compliance in Washington, DC, is handled by the DC Historic Preservation Office, a unique hybrid that

operates as a local city/county agency as well as the SHPO. Typically, the DC HPO Archaeology team does not conduct compliance activities, but we do employ federal and local compliance mandates to require—nudge, coax, cajole, and wheedle—federal and local agencies to include public outreach and education elements in mitigation plans. We are especially pushy about projects on District-owned property and push for consultants to give presentations to the public at local venues and to develop educational materials. We also encourage consulting firms to participate in outreach events or to volunteer with us. Creating effective outreach activities and developing a cadre of volunteers to help present them to the public takes time and effort. We observed a hunger for neighborhood-level historical and archaeological information (stories) that create a sense of place for new residents and that demonstrate deep-seated ties of the extant community. In a highly educated city with deep levels of income disparity and gentrification pressure, we find that the gold standard is the goodwill and sense of community we generate through public outreach.

Ames, Christine [20] see Troccoli, Ruth

Ames, Christopher [151] see Collins, Benjamin

Ames, Christopher [151] see Phillips, Natasha

### **Ames, Nicholas (University of Notre Dame)**

[193]

#### ***Challenging Structured Space at Sea: The Case of Nineteenth-Century Migrants***

This research addresses structures of migrant ship-board space during nineteenth-century transatlantic crossings. I ask to what extent did controlled use of space reinforce conditions of class on nineteenth-century migrant vessels, and in what ways were boundaries challenged by passengers? I argue that challenging shipboard boundaries was a means by which passengers sought to reclaim senses of personal and community agency within the heavily structured space of ships at sea. I draw on historical accounts by migrants during passage, as well as my own phenomenological experience crossing the Atlantic by sail. Migrant ships during the nineteenth century were heavily structured by ticketed class, largely defined through restrictive access to space, with steerage passengers often restricted of space, air, and light. However, these structures were also fluid, as passengers challenged their contextual limitations. Individuals in steerage often engaged in “subversive economies,” gaining access to upper-classed spaces, privacy, and better foods through bribing crew. Conversely, wealthy individuals sometimes masqueraded as paupers in steerage as a matter of voyeuristic “adventure.” By focusing on negotiated space aboard nineteenth-century ships, I aim to further contribute to the historical understandings of how space was constructed, politicized, and challenged within migration processes of the past.

Amicone, Silvia [17] see Freund, Kyle

### **Ammerman, Steven (University of California, Los Angeles)**

[94]

#### ***Wild Animals in Cities: A View from South Asia's Early Historic Period Using a Zooarchaeological and Textual Approach***

Urban settings are often imagined as fully domesticated landscapes, but in fact cities are complex ecosystems where many kinds of animals, including non-domesticates, play important roles. Textual evidence from the Early Historic period of South Asia gives us a glimpse at the diverse animal communities present in cities from this time period. A comparison of the ecologically complex cities implied by these texts to zooarchaeological evidence from the urban site of Sisupalgarh, East India, provides clues as to how economies and relationships to the natural world evolved in cities as external factors such as religious and ideological changes altered people's approaches to animals. During the early period of its occupation, the economy of Sisupalgarh relied on a broad range of both wild and domestic animal resources, but by the later period of its occupation, domestic animal remains dominate the faunal assemblage. This presentation will explore how textual evidence can present possible explanations for this change and provide clues as to the economic and depositional processes that resulted in the recovered faunal material at Sisupalgarh. More broadly, it will discuss how we can expand these insights to think about biases present in the fauna recovered from archaeological excavations of urban sites.

Anderson, Arthur [103] see Patton, Katherine

### **Anderson, Cheryl (Boise State University)**

[127]

#### ***Contextualizing Conflict: Social Theory in the Bioarchaeology of Central Anatolia***

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

Anderson, Cheryl [78] see Taylor, Katie

Anderson, David [10] see Wells, Joshua

**Anderson, Emily (Johns Hopkins University)**

**[169]**

*Giants in the Hand: Scale, Materiality, and the Unique Social Lives of Seal Stones*

Very small things, especially ones worn on the body, have unique positions within persons' lives and across them. They possess their own type of temporal and material persistence, arising not from being large and formidably unmovable, but from an ability to discreetly carry on from one moment and space to another. Given their substance, significations, or crafting, they can be rich in value even while also being easily overlooked; as undemanding travelers, their biographies can be complex and boundary-crossing. This paper focuses on seal stones and considers the unique character of tiny things, as anthropological and material subjects. I consider their coming-into-being in the hands of craftspersons as well as their distinctive and participatory circuits through human lives, as simultaneously rich in their material and iconographical dimensions.

Anderson, J. Heath [30] see Crider, Destiny

**Anderson, Jane (ENRICH / New York University) and Stephanie Carroll (Native Nations Institute, University of Arizona)**

**[49]**

*Indigenous Data Sovereignty, the CARE Principles, and the Traditional Knowledge and Biocultural Notices: Responsibilities for Researchers in Archaeological Data Collection*

Extractive and unethical research practices led to the accumulation of Indigenous collections in vast national repositories that have missing, incomplete, and impoverished records and metadata. The articulation of Indigenous Peoples' rights and interests in data about their peoples, communities, cultures, and territories is directed toward reclaiming control of data, data ecosystems, and data narratives in the context of open data and open science. The people and purpose-oriented CARE Principles for Indigenous Data Governance (Collective Benefit, Authority to Control, Responsibility, and Ethics) reflect the crucial role of data in advancing innovation, governance, and self-determination among Indigenous Peoples. This paper will focus on the CARE Principles and identify practical tools for implementing these alongside the FAIR Principles in the context of archaeological data. It will discuss how specific mechanisms, like the Traditional Knowledge (TK) and Biocultural (BC) Labels and Notices, function as examples of practical tools that actively support the adoption and implementation of CARE across institutions and data repositories. The objective of this paper is to address researcher responsibilities around Indigenous Data Sovereignty, and to identify tools and mechanisms that can create new standards for equitable practices around Indigenous data within CRM contexts.

**Anderson, Ridge and Zach Chase (Brigham Young University)**

**[182]**

*"Paria Caca Loves Him": The Camelid and Huarochirí Sustenance and Ceremony*

Camelids, especially llamas, feature prominently in the myths, history, and descriptions of ceremony that constitute the seventeenth-century Quechua manuscript of Huarochirí. In this text they augur catastrophe (vocally and through readings of their insides); they were the focus of annual gatherings of flocks, families, and fertility charms; they were offered in sacrifice and raced in rituals to increase their abundance and the wealth of their owners. In this paper we combine these textual data with new faunal data from excavations at the Huarochirí manuscript's ceremonial center of Llacsatambo (Peru), and recent discoveries of sites likely associated with the camelid-centered rituals described in the manuscript. This multidisciplinary portrait of the interactions of the late prehispanic peoples of Huarochirí and their camelids reveals information about breeding and pastoralism, consumption patterns of camelid meat and bone tools, and the range of quotidian and ceremonial space inhabited by camelids around Llacsatambo.

**Andrieu, Chloé (Université Paris 1 Panthéon-Sorbonne)**

**[188]**

*Discussant*

Angelo, Dante [86] see Camp, Stacey

**Angeloff, Nick**

**[54]**

*The Archaeology of Cannabis in Humboldt County*

The cannabis industry in Humboldt County, California has driven archaeological work over the past three years. The Cultural Resources Facility at Humboldt State University in collaboration with Archaeological Research and Supply Company strive to garner research value from the exponential increase in workload created by regulatory requirements. Several significant sites have been impacted by past cultivation activities and have been required to mitigate past damages as part of the permitting process. Working with the local tribe, Bear River Band of Rohnerville Rancheria, we have collaborated to preserve these sites. One complex of sites, designated Bell Springs Taliaferro 1-4, is the subject of ongoing research that has yielded significant data regarding ethnographic through archaic period use of the emerald triangle with at least 8000 years of habitation at this location. The results of assemblage analysis are presented here in the context of our broader research synthesizing survey and excavation data from over 300 locations. We present herein a broad landscape scale analysis of survey results in the emerald triangle as it relates to this significant deposit.

Anschuetz, Kurt [49] see Dongoske, Kurt

**Antorcha Pedemonte, Ricardo and Lane Fargher (Centro de Investigación y de Estudios Avanzados del IPN)**

[71]

*Common Pool Resources, Collective Actions, and Landscapes: A Cross-Cultural Evaluation*

Human modification of the environment with the goal of increasing productivity, variously referred to as landscape transformation, niche construction, environmental engineering, etc., has been recognized and studied by a larger number of scholars across a multitude of disciplines. Yet, much of this research has focused on documenting the physical modifications made to the environment with little orientation toward understanding the social scales at which these modifications were made and the institutional arrangements, if any, that made it possible to enact changes and maintain resultant landscapes. We hold that, regardless of disciplinary orientation, orchestrating physical changes in environments involves solving collective action problems related to the management of Common Pool Resources. Accordingly, in this paper, we analyze the relationship among Common Pool Resources, management scale, institutional strategies, and landscape changes in a large sample of geographical zones and time periods.

Appelt, Martin [179] see Desjardins, Sean

**Aprile, Jamie (George Mason University)**

[70]

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

The Etruscan cemetery around the San Giuliano Plateau has been looted extensively, but salvage excavations of several emptied tombs have yielded results that increase our understanding of the funerary landscape. In the 2018 and 2019 field seasons, two vertically adjacent tombs on a hillside were excavated down to bedrock, both of which revealed complex stratigraphy representing ancient activities related to tomb construction, landscape modification, and funerary ritual as well as post-abandonment damage. In this paper, the results of these two seasons of field work will be presented with special attention paid to the complex long-term formation processes that contributed to the current state of the site, now part of a regional nature park. Discoveries include a possible hillside pathway, evidence of stone quarrying, an intact exterior cremation grave, and direct evidence of looting practices. Although Etruscan cemeteries are often characterized in the literature by typological uniformity, these excavations suggest that variability may have been common in smaller, less elaborately decorated chamber tombs.

**Aquino, Daniel (National Museum of Archaeology and Ethnology of Guatemala) and Juan Melendez (Musée du quai Branly–Jacques Chirac, Paris, France)**

[51]

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

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

**Aracena, Kodiak (Universidad Mayor de San Andrés)**

[111]

*Merqueitalaque: Un ejemplo de resistencia e interdependencia local a la llegada Inka*

La anexión de otros grupos culturales fue una estrategia sociopolítica recurrente de la política incaica durante el siglo XV. Dichas estrategias tendían a variar según la ubicación, las características de los grupos humanos, y el tipo de la relación de éstos con el Incario. Mediante la investigación para mi Tesis de licenciatura en la UMSA, se tuvo la oportunidad de entrever este tipo de relación a un nivel local, donde las particularidades de ubicación, grupo y tipo de asentamiento le otorgaron características especiales. El trabajo fue desarrollado en la parte nororiental del Lago Titicaca, justamente donde comienzan los descensos abruptos hacia los valles. El periodo de interés confluye entre el Periodo Intermedio Tardío y el arribo inca a la zona, donde se pudo evidenciar estos momentos de ocupación. Constituyéndose Merqueitalaque como el sitio principal de la zona y debido a su posición geopolítica estratégica, es que pudo haberse mantenido cierta independencia, desde el PIT y durante el Horizonte Inca. Se llegó a entender dicha configuración interna gracias a los análisis espaciales y arquitectónicos realizados en el asentamiento, los cuales, sumados a una revisión de la cerámica, proveyeron información respecto a las dinámicas entre ambos grupos, tanto paisajísticamente como culturalmente.

Arango-Galván, Claudia [50] see Rosado-Fuentes, Alejandro

**Arbuckle MacLeod, Caroline (University of British Columbia)**

[166]

*Online Digital Pedagogy and the Database of Religious History*

In the last decade, scholars in the fields of archaeology and history have come to appreciate the potential of digital tools for transforming how we excavate, organize data, and share it with the world. As these various approaches become more integral to these disciplines, instructors have also been working on improving the digital literacy of their students. There is therefore a need for accessible, online pedagogy tools, especially in light of the COVID-19 pandemic; however, scholars have also noted that students in the humanities and social sciences experience discomfort when asked to work with digital, data driven projects. In this paper, I explore the pedagogy opportunities offered through the Database of Religious History (DRH). The DRH has created a number of free, online teaching packages to help students at the undergraduate and graduate level become more comfortable exploring and manipulating data in online databases. These projects also help students better understand the process of knowledge production and interpretation, while learning about ancient and modern religious concepts, monuments, and artifacts. Short group activities are designed to introduce the students to these tools, while more in-depth projects can then be assigned once students have become comfortable working with this resource.

Arciniega-Ceballos, Alejandra [50] see Rosado-Fuentes, Alejandro

#### **Areche, Rodrigo (Qhapaq Ñan Project)**

**[128]**

*Reconstructing the Political Dynamic of the Inka State in the Cañete Valley: A Perspective from the Site of Huacones–Vilcahuasi*  
In the Cañete Valley, one of the most important valleys in the south coast of Peru, the Inca presence was strong according to ethnohistoric documents and archaeological evidence. Most archaeological evidence for this strong presence comes from sites such as Incahuasi of Lunahuana and Cerro Azul. However, recent research at Huacones–Vilcahuasi, one of the largest architectural complexes and the center of political administrative power of the local group called Guarco in the Cañete Valley, has provided new evidence about economic and political organization during the Late Horizon Period (AD 1400–1532). In this paper, we will use the new evidence from Huacones–Vilcahuasi and contemporaneous sites in order to reconstruct the political dynamic in the Cañete Valley under the Inka government.

Argüjo, Jennifer [132] see Sion, Julien

Arias Espinoza, Oscar [149] see Yamamoto, Atsushi

#### **Arieta Baizabal, Virginia (Instituto de Antropología, Universidad Veracruzana) and José Ignacio Hernández Juan (Universidad Veracruzana)**

**[119]**

*Entre tres ríos y dos capitales: La región de Capoacan y el sitio olmeca de Antonio Plaza, Veracruz*  
Antonio Plaza, ubicado al margen del río Uxpanapa, es conocido y señalado como el lugar de origen de uno de los hallazgos más polémicos de la arqueología de la costa del Golfo de México, hacemos referencia a la escultura conocida como El Luchador. A pesar de que esta extraordinaria pieza ha provocado la discusión sobre su autenticidad prehispánica, no se había realizado una investigación arqueológica sistemática en la región de Capoacan —un área estratégica intermedia entre los ríos Coatzacoalcos, Capoacan y Uxpanapa, una isla ubicada justo en medio de los sitios olmecas de San Lorenzo, Veracruz y La Venta, Tabasco. Por tal motivo, en 2017 dio inicio un proyecto de investigación en la región que tiene como uno de sus objetivos la clarificación de hechos y la contribución al conocimiento de la arqueología regional. En esta ponencia se presentarán los resultados del programa de reconocimiento de superficie y del análisis de los materiales, mismos que revelan información importante sobre la dinámica poblacional de un sitio intermedio, espacial y temporalmente, a las dos capitales olmecas del Preclásico mesoamericano.

Arieta Baizabal, Virginia [119] see Izquierdo, Ana Luisa

#### **Arksey, Marieka (Jefferson Patterson Park & Museum)**

**[183]**

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

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

**[183]**

*Chair*

Armenta, Vanessa [8] see Giffin, Sarah

Armstrong, Douglas [147] see Wallman, Diane

**Armstrong-Fumero, Fernando (Smith College)**

[86]

*What Happens When Objects Become Artifacts?*

The term “artifactual surface” refers to a particular confluence of law and materiality. Protections that are afforded to objects of tangible cultural heritage assume that these objects should indefinitely retain the same physical form that they possessed at the time that that came under official protection. This assumption not only defies the effects of time and use-wear, it also contradicts the assumption that “culture” is rooted in and reproduced by quotidian practice. In this paper, I examine a range of political effects of this often unquestioned assumption of heritage practice. I will draw on ethnographic examples of tensions between archaeologists and stakeholder communities, the writing of early and influential figures in anthropology, and works of popular culture as well as close reading of current legal frameworks. The goal is to explore alternative approaches of tangible heritage that offer more opportunities for collaboration between scholars and nonacademic stakeholders in the stewardship of objects.

[86]

Chair

**Arnould, M. Charlotte (CNRS), Eva Lemonnier (Université Paris 1 Panthéon-Sorbonne) and Julien Hiquet (CNRS UMR 8096)**  
[104]

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

Ideally every ancient Maya city should be characterized by its population density and its urban agricultural productivity, closely linked parameters that must be explored before tackling the issue of production/exchange relations with hinterlands. Río Bec can be characterized as a low-density urban landscape with high agricultural productivity in intensified infields. Through time the housing system changed as the local farmers built many vaulted multiroom structures increasing lodging capacities. Intensive and extensive excavations of several household clusters have allowed us to reconstruct specific neighborhood dynamics—the basis for a model that is applied to the Río Bec 1.6 km<sup>2</sup> settlement core, strengthened by datations obtained from a wide sample of tested units. Those modeled dynamics in turn help reconstruct the evolution of the demographic charge through the Classic period. This specific method is evaluated, and comparative insights are derived from datasets obtained from La Joyanca (northwestern Petén) and Naachtun (central Petén).

Arneson, Aundria [11] see Smith, Michael

Arnold, Philip [2] see Puente, Nicholas

**Arnold, Samuel and Marcus Key (Dickinson College)**

[6]

*Lead Test of the Corotoman Reuse Hypothesis for the Stone Floor of Colonial Christ Church (Irvington, VA)*

Robert Carter began construction of historic Christ Church (Irvington, Virginia) in 1730. Much of the original church still remains to this day, with almost all of the original stone floor pavers still intact. There is a lack of natural stone in the surrounding area and historical documentation suggests that the stone used in Christ Church may have been reused from the nearby Corotoman mansion. We hypothesized that the stone pavers from Christ Church were scavenged from the Corotoman mansion, Robert Carter's home which burned down one year before, in 1729. During excavation, historical archaeologists found evidence that the Corotoman mansion had lead gutters, windows, and flashing that would have left molten lead drops on the original stone floor after the fire. We compared the chemistry of the original stone paver artifacts recovered from the Corotoman mansion with those from Christ Church looking for traces of lead drops using a scanning electron microscope with an energy dispersive spectrometer. The relative weight percent lead on the samples from Christ Church and Corotoman support our hypothesis that the stone pavers used in the construction of Christ Church were likely reused from the Corotoman mansion.

**Arroyo, Barbara (Museo Popol Vuh, Universidad Francisco Marroquín, Guatemala), Javier Estrada (Proyecto Arqueológico Kaminaljuyu) and Gloria Ajú (Proyecto Arqueológico Kaminaljuyu)**

[104]

*The Population of Kaminaljuyu, Guatemala during the Preclassic Period: New Considerations*

The population estimates from the Preclassic period for the site of Kaminaljuyu located in the Maya Highlands were the result of regional surveys conducted by the Pennsylvania State University research program in the 1970s. Since then, Guatemala City urban sprawl has impacted the site conservation. However, this modern growth has allowed new interpretations on the population density of the site during Preclassic times. Many deeply buried Preclassic deposits and buildings have been uncovered by modern constructions, exposing large and densely populated areas of the site. This has led to the reconsideration of the original population estimates at Kaminaljuyu during the Preclassic period. This paper will present the results of recent fieldwork that has expanded the knowledge of the density and complexity of the occupation of the central valley of Guatemala during Preclassic times.

**Arroyo-Cabral, Joaquín, Luis Morett-Alatorre (Universidad Autónoma Chapingo) and Xolotl Morett-Muñoz (Pixcani Huehuetlatolli)**

[33]

*Columbian Mammoth Remains (Proboscidea, Mammuthus columbi) from Unit UE1, Tocuila Archaeo-Paleontological Site, Mexico*

From a small excavation unit 5 × 6 m named UE1 in Tocuila, Texcoco Municipality, State of Mexico, Mexico, around 1,300 bone elements were recorded, of which we have analyzed about 80%, being outstanding the remains of Columbian mammoth (*Mammuthus columbi*), constituting about 90% of the total. According to the stratigraphic distribution of the materials, there is a minimum count of nine individuals, including juveniles and adults, females and males, presence of osteopathological signs, carnivore gnawing, and several other taphonomic agents. Also, there are weathering marks as evidence of processes occurring before the first mudflow that covered the bone and filled up the paleochannel at the end of the Pleistocene. Here, some stratigraphic and horizontal patterns are shown, which could explain the sequence of deposit formation. In addition, other patterns indicate the presence of intentionally modified bone remains that could mean human activity, especially significant in layers FL-I (50%) and FL-IV (40%), separated by more than two millennia. Diagnostic characteristics for those patterns are presented.

Arroyo-Cabrales, Joaquín [33] see Morett-Alatorre, Luis

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

[62]

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

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

Audin, Laurence [89] see Combey, Andy

**Augustine, Jonah (University of Wisconsin)**

[182]

*Common Sense and the Distribution of the Sensible in Ancient Tiwanaku, AD 500–1100*

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

Auld-Thomas, Luke [104] see Canuto, Marcello

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

[67]

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

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

Austin, Robert [152] see Marken, Damien

Avila, Mary [118] see Bazán Pérez, Augusto

**Awe, Jaime**

[188]

*Discussant*

Awe, Jaime [25] see Ebert, Claire  
 Awe, Jaime [23] see Ellis, Olivia  
 Awe, Jaime [67] see Izzo, Victoria  
 Awe, Jaime [158] see Stemp, W. James  
 Awe, Jaime [140] see Sullivan, Kelsey  
 Awe, Jaime [61] see Watkins, Tia

Axelrod, Ella [38] see Jamison, Gregg

Ayala, Gianna [97] see Moody, Bryony

**Ayers-Rigsby, Sara (Florida Public Archaeology Network)**  
**[113]**

*Discussant*

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

**[149]**

*Climate Change in Coastal Ecuador*

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

**Ayers-Rigsby, Sara (Florida Public Archaeology Network)**

**[187]**

*Chair*

**Ayling, Melissa (Simon Fraser University)**

**[62]**

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

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

**Azar, Madelaine (University of North Carolina at Chapel Hill)**

**[51]**

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

Symbolically charged ceramic rim-effigy bowls, characterized by figural head and tail adornments, are hallmarks of the Late Mississippian period in the central Mississippi River valley (CMV). Hundreds of whole rim-effigy bowls, most often depicting serpents, birds, or humans, have been collected at sites from southeastern Missouri to northwestern Mississippi. However, a comprehensive iconographic analysis of the CMV rim-effigy bowl corpus—specifically focused on visual style and theme—has never been conducted. A systematic review of the corpus's imagery suggests that CMV rim-effigy bowls acted as materializations of the Mississippian cosmos, reinforcing the principle of cosmic balance. Further, given discrete concentrations of bowl styles and themes across the region, localized religious collectives—perhaps sodalities—may have produced their own rim-effigy bowls for use during charter rites or ceremonies. Ultimately, this review of a previously understudied ceramic corpus serves to broaden understandings of Mississippian art and iconography in the CMV and beyond.

Babchanik, David [39] see Hackenberger, Steven

Babot, Pilar [159] see Comeca Ramirez, Gianina



**Babucic, Nikola (Universität Hamburg), Jörg Linstädter (DAI), Sabrina Stempfle (Universität Hamburg) and Martina Seifert (Universität Hamburg)**

**[124]**

*Tracing Early Farming Communities in Southern Mozambique by Geophysical Prospection: Current State of Activities, Part 2*

In southern Africa, the appearance of pottery was first recognized in the context of Early Farming Communities (EFC) about 2000 BP. Increasingly, pottery can be linked to hunter-gatherers, therefore southern Africa stands out as a place to investigate the contact between these two communities. In 2016, Eduardo Mondlane University Maputo and the German Archaeological Institute started a joint research project. Various surveys in Changalane, Maputo Province, documented new sites. In 2018, an initial geomagnetic prospection was performed at an open-air site near the famous Daimane shelter. The survey detected 18 magnetic anomalies that revealed two round anomalies interpreted as possible huts or kilns. The general lack of comparative studies necessitated verification by other geophysical methods and archaeological excavation. Therefore, in cooperation with Hamburg University, geophysical surveys were conducted. The recording of magnetic variations and electromagnetic signal responses may help to indicate further pithouses, pottery fields, and kilns in the context of EFC. The results will reveal additional excavation sites, which in return will allow confirmation of the geophysical results. Subsequently the project will be expanded to include archaeometric pottery analysis.

Babucic, Nikola [124] see Linstädter, Jörg

Babucic, Nikola [124] see Stempfle, Sabrina

**Bach, Jaime**

**[121]**

*Discussant*

Bachor, Susan [109] see Obermeyer, Brice

**Bader, Gregor (Senckenberg Centre for Human Evolution and Palaeoenvironment, Tübingen), Lyn Wadley (University of the Witwatersrand), Christian Sommer (University of Tübingen) and Nicholas Conard (University of Tübingen)**

**[151]**

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

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

Bailer, Shara [151] see Fisher, Erich

Bainton, Nick [38] see Lilley, Ian

Bair, Daniel [48] see Terry, Richard

**Baitzel, Sarah (Washington University in St. Louis)**

**[106]**

*How to Make a Proper Bundle: Ritual Knowledge Transfer and Mortuary Communities of Practice in the Tiwanaku Diaspora*

The concept Community of Practice (CoP) has found surprisingly limited application in archaeology beyond craft production, yet it also lends itself to examining the situated learning of ritual practices. Rituals require strict adherence to actions and knowledge systems that are guarded by specialists and that involve places and actors from (super)natural realms and across multiple temporal and spatial dimensions. In particular, mortuary rituals comprise the “production” of funerary bundles and burials—objects and places where artifacts and human bodies become wrapped up in emotions and memories. Here, I examine diasporic Tiwanaku funerary practices at the provincial center of Omo M10, Moquegua, Peru, (AD 700–1150) through the lens of mortuary Communities of Practice. I argue that the preparation of funerary bundles and their interment provided arenas of situated learning in which mourners acquired knowledge of proper funerary procedures. A close analysis of funerary processes and their variability across discrete cemeteries reveals the tensions between the intimacy and immediacy of bundle preparation and burial, and the social demands of diasporic life and identity maintenance. I propose that burial offerings and cemeteries acted as boundary objects and places in articulating different temporal, spatial, and spiritual realms.

**[106]**

*Chair*

Baitzel, Sarah [16] see Corcoran-Tadd, Noa

Bajorek, Katelyn [20] see Hosek, Lauren

**Baker, Lori (Baylor University)**

[70]

*Osteological Analysis of Two Contemporary Tombs from the San Giuliano Necropolis*

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

**Bakke, Gwen (Southern Methodist University)**

[13]

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

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

**Bakour, Dina**

[44]

*The Umayyad Grilles of Qasr al-Hayr al-Gharbi*

Discovered in 1936 and excavated for two years by Daniel Schlumberger, Inspector of the Antiquities Department during the French Mandate (at the time), Qasr al-Hayr al-Gharbi remains one of the most important early Islamic sites. In this paper, I will introduce the site and its history of archaeological expeditions. I will describe the plaster grilles, the initial disposition of their fragments, and their painstaking reconstruction by Nassib Saliby. These window grilles were ultimately displayed in the (recently destroyed) Palmyra Museum, and mainly at the Damascus National Museum in architectural configurations that often simulate their original context. With this foundation, I will discuss how the Umayyad grilles contributed to a novel creative dynamic of interior illumination, anticipating by many centuries the stained-glass compositions of ecclesiastic structures in Europe. Finally, I will reflect on how the case of Qasr al-Hayr al-Gharbi created significant problems for both heritage management in Syria and also for the tantalizing proximity of archaeological and historical knowledge.

Balan, Gabriel [4] see Ivins, Erica

**Balanzario Granados, Sandra (INAH)**

[76]

*Datos arqueológicos del asentamiento prehispánico de Dzibanché, Quintana Roo*

El asentamiento prehispánico de Dzibanché, se localiza en el Sur de Quintana Roo, tiene una extensión aproximada de 60 km<sup>2</sup>, superficie que incluye las áreas destinadas a la producción de alimentos y áreas habitacionales. Dzibanché fue el asiento de la dinastía Kaanu'l, durante el periodo del Clásico. El asentamiento urbano se conforma por espacios cívico ceremoniales y conjuntos habitacionales asociados a la elite, distribuidos en cuatro grupos de arquitectura monumental: Dzibanché Central, Kinichná, Tutil y Complejo Central "Lamay", espacios con funciones específicas, comunicados por calzadas prehispánicas "sacbeob". Durante el periodo del Clásico Temprano predominó el estilo Petén, estilo que fue remplazado en el periodo del Clásico Medio-Clásico Tardío (500-650 dC) por el estilo local "Pilastras pareadas". La existencia de monumentos grabados con inscripciones e imágenes de cautivos atados y semidesnudos, la uniformidad en el sistema de enterramiento en cámaras funerarias con suntuosas ofrendas, el estilo local y el extenso patrón de asentamiento, denotan la hegemonía de la dinastía Kaanu'l en las tierras bajas mayas.

Balanzario Granados, Sandra [76] see Estrada-Belli, Francisco

**Balanzategui, Daniela (UMASS Boston)**

[112]

*Discussant*

**Balanzategui, Daniela (UMASS Boston)****[186]***Landscapes of Maroon Societies in Ecuador*

This presentation debates the permeability of eighteenth-century landscapes of colonialism and slavery in the Andean region, based on the ethnohistorical and ethnographic research of *cimarronaje* and *palenques* (maroonage) heritage in the Afro-Ecuadorian Ancestral Territory (between the Chota-Mira Valley and the province of Esmeraldas, Ecuador). A legacy of epistemologies generated within the *territorio cimarron* and *palenquero* (maroon landscapes) demonstrates a continuous and dynamic process of national sovereignty defense over their ongoing created and revitalized ecologies. In the context of a new stage of the project "Collaborative Archaeology in the Afro-Ecuadorian Ancestral Territory of the Chota-Mira Valley," this paper explores the archaeological reconstruction of historical ecologies of Afro-Ecuadorian *cimarronaje*.

**Balcarcel, AnaBeatriz (Mirador Basin/FARES Foundation), Richard Hansen (Mirador Basin Project Director), Carlos Morales-Aguilar (Field Director) and JuanLuis Velésquez (Archaeologist)****[48]***Games or Prehispanic Rituals? The Ball Courts of the Mirador Basin*

The ballgame was one of the most widespread in Mesoamerica since the Early and Middle Preclassic periods if not earlier. This presentation will present the different ball courts detected in the Mirador Cultural and Natural zone, also known as Mirador Basin, indicating the chronology, form, contextual associations, and the results obtained in the excavated ball courts. / La cancha para juego de pelota fue una de las construcciones más difundidas en Mesoamérica desde inicios del Preclásico si no más temprano. En esta ponencia se expondrán las diferentes canchas de pelota registradas hasta la fecha en la Zona Cultural y Natural Mirador, conocida también como la Cuenca Mirador. Se hará referencia en la cronología, forma, asociación contextual, como también los resultados obtenidos en las canchas excavadas.

**Balco, William (University of North Georgia)****[64]***Meaningful Engagement on a Shoestring Budget in North Georgia*

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

**Baldwin, J. Dennis (University of Texas, Austin)****[56]***Discussant*

Balée, William [66] see Rocha, Bruna

**Baltus, Melissa (University of Toledo)****[123]***Mediating Powers, Negotiating Inequalities: Ecological Politics at Cahokia*

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

Bamforth, Douglas [96] see Gover, Carlton

**Bandy, Matthew (SWCA Environmental Consultants) and David Reinhart (SWCA Environmental Consultants)****[100]***Automated Identification of Archaeological Features in a Regional Lidar Dataset from Southeastern New Mexico*

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

**Banks, Kimball (Metcalf Archaeological Consultants Inc.)**

**[160]**

*Moderator*

**Banks, William (CNRS [PACEA Laboratory]) and Philippe Lanos (CNRS)**

**[97]**

*An Application of Hierarchical Bayesian Modeling to Upper Paleolithic Archaeological Cultures in France between 32 and 21 cal ka BP*

Investigations of chronology play a key role in the majority of archaeological research endeavors and are particularly pertinent to examinations of culture-environment relationships, especially during periods marked by pronounced climatic variability. Rigorous evaluations of data and robust methods are necessary to reconstruct reliable chronologies, and this is especially true for periods associated with relatively few radiometric measurements. Such is the case for the Upper Paleolithic archaeological record of present-day France from 32,000 to 21,000 cal BP. We rely on critically examined radiocarbon measurements from contextually secure archaeological contexts and employ a recently developed method of Hierarchical Bayesian Modeling to reconstruct the chronology of archaeological cultures from the Middle Gravettian to the Badegoulian. The resulting chronological intervals for each typo-technologically defined cultural phase are compared climatic records thereby permitting each to be correlated with documented paleoclimatic variability. These results are evaluated by producing an age model with the new IntCal20 calibration curve and then comparing it to a subsequent model that incorporates numerous recently obtained radiocarbon ages. This approach for constructing regional chronologies represents a significant improvement over methods employed to date because it takes into account all available radiometric data via an intersecting multiphase age model.

**Bankuti, Natalie**

**[189]**

*Emblems of Authority: A Comparison of Preclassic and Classic Maya Inscribed Jade Adornment*

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

**Banning, Edward (University of Toronto)**

**[49]**

*Assessing the Quality of CRM Data for Field Planning, "Big Data" Analyses, and Heritage Decisions: The Role of Sweep Widths* Sweep width is a basic measure of survey effectiveness that has long informed search-and-rescue operations but is only slowly finding application in archaeological survey, mainly by fieldwalking. By "calibrating" field teams by having them survey tracts sewn with artifacts in known locations, it is possible to estimate sweep widths for a variety of artifact types and visibility contexts. These estimates can then serve to help us decide effective transect spacings, evaluate the probability that survey has missed particular kinds of targets, and make the results of surveys with different levels of intensity more easily comparable. Although it can also be adapted to shovel-testing and other surveys, this paper will demonstrate the use of sweep width in fieldwalking and discuss its costs and benefits for allowing us to assess and improve surveys' accuracy and reliability. It will only briefly introduce a software platform, still under development, to assist in the determination of sweep widths.

Banning, Edward [173] see Hitchings, Philip

**Baquedano, Elizabeth (UCL Institute of Archaeology)**

**[154]**

*Decapitation and the Vulnerable Nature of Joints among the Aztecs*

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

**Barba, Luis (Universidad Nacional Autónoma de México), Jorge Blancas (Universidad Nacional Autónoma de México), Agustín Ortiz (Universidad Nacional Autónoma de México), Ricardo Leonel Cruz Jimenez and Sarah Clayton (University of Wisconsin-Madison)**

**[177]**

*Geophysical Studies in the Archaeological Site of Chicoloapan, Estado de Mexico*

In this paper we present integrated archaeological and prospection data from Chicoloapan, in the Estado de Mexico, generated by drone aerial photo, topographic survey, electric, magnetic, and geo-radar techniques. These data result from three years of research by the Proyecto Arqueológico Chicoloapan Viejo, a collaboration between UNAM and University of Wisconsin-Madison that investigates the local impact of Teotihuacan's decline and the growth of an Epiclassic town. The site includes several visible mounds that appear on the surface to be isolated, but we know now that they were part of large architectural complexes that include the mounds, sunken patios, plazas, and surrounding residences. Sunken patios are well preserved since they remained beneath the plow zone. Architectural remains located close to the surface have been altered by modern mechanized agriculture, but we have been able to detect the buried remnants of walls and plastered floors of large, multiroom structures. Some of these structures incorporated volcanic stones in walls, making it possible to detect them through magnetic studies. After covering 50,000 m<sup>2</sup> with geophysical methods, we have a clearer understanding of the architecture present and can better characterize the relationship between visible mounds and other kind of buried civic and residential structures.

Barba, Luis [177] see Cruz Jimenez, Ricardo Leonel

Barba, Luis [101] see Pecci, Alessandra

Barbel, Héloïse [148] see Woollett, James

**Barber, Sarah (University of Central Florida)**

**[135]**

*Discussant*

**Bardolph, Dana (Northern Illinois University)**

**[81]**

*What Is at Stake in Archaeological Knowledge Production*

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

Barhoumi, Chéïma [78] see Cromartie, Amy

**Barket, Theresa (California State University, Bakersfield), Felicia De Peña (University of California, Berkeley) and Ahmad Taher (Independent researcher)**

**[140]**

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

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

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

**[130]**

*Modeling the Early History of Maize in the North American Southwest*

Although originally domesticated in Mexico, the initial adoption and spread of maize (*Zea mays*) are key to understanding the forager-to-farmer transition in the North American Southwest. Fundamental to our understanding of this transition is chronology, especially related to the introduction, spread, and use of maize. This study uses different statistical modeling techniques on over

600 maize radiocarbon dates from 100+ Archaic and early Formative sites to examine the initial introduction, pace of maize dispersal, and intensity of maize use in the North American Southwest. Bayesian chronological modeling is used to provide formal estimates for the initial introduction of maize. Tempo plots are constructed from the Bayesian models to provide a relative measure for the pace of maize dispersal. Kernel density estimation (KDE) models are used to examine the distribution of maize to infer intensity of use during the Archaic period. The results of the tempo plots and KDE models are then compared to different paleoenvironmental reconstruction datasets to explore the relationship between Archaic maize dispersal, use, and climate change. These models provide more refined chronologies and allow for greater insight into the relationships between people, cultivated plants, and the environment.

[130]

Chair

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

[164]

Moderator

Barkwill Love, Lori [37] see Whisenhunt, Mary

Bar-Oz, Guy [191] see Butler, Don

Bar-Oz, Guy [68] see Vaiglova, Petra

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

[29]

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

A circular stone tomb at the site of Tell Abraq (UAE) on the southern coast of the Arabian Gulf was used as a mortuary feature for approximately 200 years (2200–2000 BC) during the Bronze Age. Both adults and children were buried in the 6 m wide tomb, causing significant admixture or commingling of the remains. This research reassessed the demography of the children and infants in the tomb by analyzing bones of the arm (humerus and radius) for comparison to previous data from the leg (right femur). Results showed similar age distributions with high rates of mortality for newborns and infants under two years of age. Data from the left humerus and right radius were able to account for seven additional subadults in the tomb, bringing the total minimum number of individuals (MNI) to 134 subadults. The demography presents opportunities for further investigation of morbidity and mortality factors among a commingled skeletal assemblage.

**Barrientos, Tomas (Universidad del Valle de Guatemala), Marcello Canuto (Tulane University) and David Stuart (University of Texas, Austin)**

[76]

*The Kaanul Dynasty and the Early History of the Northwest Petén*

Over the past two decades it has become increasingly clear that the ancient Maya political landscape was permeated by regional systems of political asymmetry. These hegemonic networks fluctuated through time, but the steady presence of a few especially dominant polities shows that they were a persistent feature with very real sociopolitical effects. Based on research carried out at the sites of Achiotal and La Corona, we offer a general interpretation of the historical and sociopolitical development of one of these regional polities allied with the powerful Kaanul dynasty. We suggest that archaeological and epigraphic data from the northwestern Petén dating to before 600 CE demonstrates this region's strategic role in Kaanul's early expansion and influence, when its court was based at Dzibanché. The evidence illuminates how its regional hegemony over much of the southern Maya Lowlands was achieved.

Barrientos, Tomas [181] see Horowitz, Rachel

**Barrientos Pérez, Catalina**

[102]

*Excavaciones en un barrio de Cholula*

Se reportan las excavaciones realizadas en los terrenos de la UDLAP en los años 1968 y 1979 a 1 km al este de la Gran Pirámide de Cholula. En 1968 se localizó un parte de un complejo habitacional y se identificaron diferentes áreas de actividades, entre ellas un horno para la producción de cerámica. En 1979, a 30 m al este del complejo habitacional y posiblemente asociados con este, se localizaron dos pozos y varios basureros. Se presentan los análisis de los objetos recuperados en los basureros aportándonos información sobre la vida diaria de los habitantes de Cholula prehispánica.

Barrios, Abby [19] see Gallagher, Joanne

Barry, Patrick [35] see McDaid, Chris

**Bartos, Nicholas (Stanford University)**

[185]

Discussant

**Barvick, Kathleen (University of Arizona)****[2]***Regional Variation Among Ancestral Pueblo Water Jars: A Geometric Morphometric Approach*

Pottery in the US Southwest has long been studied for the insights it provides into social identity. Differences in construction may suggest differences in conceptions of the correct way to make a ceramic vessel; when studied through the lens of practice theory, variation in form speaks to alternate communities of practice and may show boundaries in pottery-making communities. Though vessel style has been investigated in many qualitative ways, Geometric Morphometrics (GM) offers a quantitative approach to measure the similarities and differences in ceramic vessel shape across a region. Vessel forming is learned through practice and is considered one of the most conservative attributes of pottery making. Subtleties in shape among the same vessel type have the potential to show how, and in what community, a potter learned their craft. This paper applies GM to a collection of Ancestral Pueblo jar profiles from the Kayenta/Tusayan and Mesa Verde areas of the Southwest, to quantify the shape differences of the vessels between and within these areas. The distribution of shapes and quantities of difference between settlements and regions helps to elucidate ways in which technological knowledge was learned and shared, and provides an alternative way to look at networks of social interaction.

**Basanti, Dilpreet (Northwestern University)****[123]***Materializing Aksumite: Power Plays through Natural Landscape in the Northern Stelae Field (AD 100–400)*

This paper looks at how the location of the central stelae field in Aksum (in use from ~AD 100–400) took advantage of natural features to amplify Indigenous ideologies. The Northern Stelae Field is the burial location of the most powerful Aksumites, and tradition dictates that at least some were kings. The stelae field is uniquely located to take advantage of three features: the central reservoir, a nepheline syenite stone quarry 6 km away, and two mountains that flank the cemetery. Working together, the mountains create a light corridor that washes over the stelae and emphasizes the unique properties of the granite stone in the early morning when most people would have accessed the reservoir. While this location is perhaps one of the worst in Aksum for the preservation of bones, it is perhaps one of the best placed to communicate powerful ideologies through the monumentality of stone. Mortuary practices indicate the stelae perpetuated ideologies of “Aksumiteness” and “localness” (over “foreignness”). Taken together, the combination of these data showcase how Aksumite elites transformed the common traditions of local cemetery into a source of ideological power through the use of Aksum’s natural features.

**Bassett, Hayden (Virginia Museum of Natural History) and Madeleine Gunter Bassett (William & Mary)****[27]***Late Woodland Settlement and Subsistence in the Southern Piedmont of Virginia: A Geospatial Analysis and Archaeological Synthesis of the Smith River Valley*

The Smith River Survey is a two-year archaeological assessment of the Smith River valley in the southern Piedmont of Virginia. This river drainage survey explores the regional settlement patterns, site functions, and subsistence logistics across the alluvial floodplains, foothills, and uplands in the southern part of Virginia’s Blue Ridge mountains. While this variable landscape has a rich Paleoindian and Archaic record, the drainage was most intensive occupied during the Late Dan River Phase (1250–1450 CE). This poster synthesizes 60 years of regional archaeological site data in order to (1) identify Late Woodland settlement patterns across the upland and lowland extents of the drainage; and (2) develop an understanding of the complex, region-wide subsistence logistics that supported the aggregated communities of the thirteenth through fifteenth centuries CE.

Bassett, Madeleine Gunter [27] see Bassett, Hayden

Bastante Abuhadba, José [89] see Combey, Andy

**Bates, Brian (Longwood University)****[193]***Improving STEM Competencies via Archaeological Research in the Staunton River Valley: An Introduction*

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

**Bates, Jennifer (Department of Anthropology, University of Pennsylvania), Adam Green (University of Cambridge), Cameron Petrie (University of Cambridge), Ravindra Nath Singh (Banaras Hindu University) and Francesc Conesa (University of Cambridge)****[123]***Many Communities, Many Foods: The Economic and Political Implications of Diversified Cropping Strategies before, during, and after Urbanism in Northwest India ca. 3200–1500 BC*

Climate crises are raising questions about how we feed everyone in our highly urbanized modern society. Anthropological research has demonstrated that economic, political, and environmental landscapes are intricately interwoven and intersect with the diverse

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

Batty, Sylvia [43] see Hoggarth, Julie

Baumann, Laura [158] see Poister, Nicholas

Baumann, Steve [109] see Hanson, Kelsey  
Baumann, Steve [158] see Poister, Nicholas

### **Baustian, Kathryn (Skidmore College)**

[127]

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

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

Baustian, Kathryn [29] see Barrett, Sophia

Bautista, Xochitl [71] see Fargher, Lane

### **Baxter, Erin (University of Colorado, Boulder / Denver Museum of Nature & Science)**

[79]

*Moderator*

Bayarsaikhan, Jamsranjav [93] see Égüez, Natalia  
Bayarsaikhan, Jamsranjav [93] see Taylor, William

### **Bazán Pérez, Augusto (Fundación Augusto N. Wiese), Jose Alva (Fundación Augusto N. Wiese), Erick Acero (Fundación Augusto N. Wiese), Mary Avila (Fundación Augusto N. Wiese) and Carlos Zapata (Fundación Augusto N. Wiese)**

[118]

*Nuevos datos sobre Moche Temprano y Tardío en Huaca Cao Viejo, Complejo Arqueológico El Brujo, valle de Chicama, Perú*  
Recientes excavaciones en la Huaca Cao Viejo proveen de información valiosa acerca de los orígenes de la ocupación Moche en el valle bajo de Chicama, así como de las fases constructivas más tardías del edificio. Las nuevas investigaciones han muestreado y fechado los bloques de adobe tramado, típica técnica arquitectónica en las construcciones monumentales Mochica, procurando adecuados parámetros temporales que permiten refinar cronologías en el edificio y en el Complejo Arqueológico El Brujo.

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

[187]

*CRM and Public Outreach: A Match Made in NHPA*

Why shouldn't cultural resource management (CRM) companies be involved in public outreach and education outside of regulatory mandates? Archaeologists are ambassadors of the discipline by nature, giving responsible access to shared history with other disciplines and members of the public as well as engaging with stakeholder communities. CRM archaeologists' autonomy, varied knowledge, and specialized equipment allow them to perform a public good by facilitating and engaging in public outreach, both actively and passively, in a number of meaningful ways utilizing diverse methods, tools, and variable scales. While the primary focus



of CRM companies must be the success in the industry as a business, public outreach also allows CRM archaeologists to reconnect with their passion for the discipline and develop skills that can translate to the commercial sector. This is a discussion covering the symbiotic relationship of CRM and public outreach and some examples of how this outreach can take place outside of expected client/project interactions.

**Beach, Timothy (University of Texas, Austin), Leila Donn (University of Texas, Austin), Cody Shank (University of Texas, Austin), Takeshi Inomata (University of Arizona) and Thomas Garrison (University of Texas, Austin)**

[119]

*Machine Learning Applications with Lidar to Predict Locations of Natural and Cultural Features in the Maya Lowlands*

This project entails creating machine learning models to predict the locations of caves and archaeological features using airborne Lidar (laser scanning) data. The goal of this work is to bridge the gap between machine learning pursued by computer scientists and the types of on-the-ground projects of interest to scientists who seek to improve management and conservation practices. This project began in 2018 with the goal of creating a targeted method of finding cave entrances in the dense tropical forests of Guatemala and Belize. In 2019, we used a random forest classifier and a training dataset of known caves to successfully identify several previously undocumented caves. This included a 200-foot-deep collapsed cave complex. Building on this work, modeling has been expanded to include other types of hidden and obscured features that colleagues are interested in studying, including ancient Maya archaeological features in Guatemala and Mexico, as well as shipwrecks. These models are based on existing convolutional neural network architectures. The first completed iteration of the models has an F1 score of 0.92. The models can be used to create more accurate maps of natural and archaeological features to aid management objectives, study patterns across the landscape, and find new features.

**Beach, Timothy (University of Texas, Austin)**

[138]

*Discussant*

**Beach, Timothy (University of Texas, Austin)**

[172]

*Discussant*

Beach, Timothy [80] see Krause, Samantha

Beahm, Emily [81] see Colaninno, Carol

Beardall, Antonio [25] see Ebert, Claire

Beaubien, Harriet [158] see Moyes, Holley

**Becerra-Valdivia, Lorena (Chronos <sup>14</sup>C-Cycle Facility, UNSW Oxford Radiocarbon Accelerator) and Tom Higham (Oxford Radiocarbon Accelerator Unit)**

[130]

*A Chronometric Study of the Peopling of the Americas*

The initial peopling of the Americas marks a major event in the expansion of modern humans across the planet. Questions associated with this dispersal remain, however, largely unanswered, with the previously accepted model, "Clovis-first," effectively refuted. Considering that timing is fundamental in the study of human dispersals, our research focused on defining a robust chronology using radiocarbon dating and Bayesian age modeling. This involved building site- and region-level Bayesian age models using chronometric data from 42 archaeological sites across North America and Beringia, which fall within specific technological and temporal categories. The chronology produced allowed us to elucidate spatiotemporal patterns of human dispersal, and the results were integrated with available genetic and climatic evidence. Our analysis showed that humans were probably present before, during, and immediately after the LGM (~26.5–19 kya), but that more widespread occupation began later, during a period of abrupt warming (~14.7–12.9 kya). We also identified the near-synchronous commencement of Beringian, Clovis, and Western Stemmed cultural traditions, and an overlap of each with the last dates for the appearance of 18 extinct faunal genera. These results suggest that human expansion and population growth were likely important factors in megafaunal extinctions.

**Becker, Sara (University of California, Riverside)**

[45]

*Anarchy, Heterarchy, and the Bioarchaeological Evidence of Labor in the Tiwanaku "State" (AD 500–1100) of Bolivia and Peru*

Early explorers thought that Tiwanaku was a ritual or pilgrimage center because of its heartland location in the high-altitude, seemingly inhospitable altiplano of Bolivia. Years after "progressing" beyond a ceremonial center, Tiwanaku was fit into the "state" category within a political systems theory typology. The reasoning was that Tiwanaku had organized, raised-field agriculture beyond pastoralist chiefdoms, horticulturalist tribes, or foraging bands (Service 1975). Tiwanaku was also proposed to be expansively similar to the Inca, with a hierarchically centralized, elite core and subservient colonies. However, recent research requires a reassessment and discussion of alternatives to the Tiwanaku state. My prior research has shown that instead of a corvée system, skeletal evidence supports community-based, reciprocal labor in the Tiwanaku heartland, colonies not working for an elite core, and a reduction in workload with the development of the Tiwanaku polity. This paper further explores skeletal labor changes at Tiwanaku

as anarchically or heterarchically organized. Using temporal and spatial changes, I evaluate a demonstrated lack of hierarchy or reduced hierarchy, increased egalitarian cooperation, and assess collaborations that resist authoritarian power as anti-community interest within this Andean society.

Becker, Sara [106] see Gaspar, Karla

Beckham, Christopher [31] see Carlson, Meredith

Beckham, Christopher [31] see Zhang, Peiqi

Beekman, Christopher [133] see Kaplan, Emily

**Begley, Christopher (Transylvania University)**

**[178]**

*Framing Intent, Power, and Agency in Eastern Honduras*

Throughout their history, the polities in eastern Honduras existed along a frontier, interacting with larger, powerful groups from a different cultural tradition to the west and with more closely related people to the south. During the period between 500 and 1200 CE, eastern Honduran groups adopted several significant elements of material culture typical of Mesoamerica, including ball courts, certain types of monumental construction, and orthogonal site plans. Other elements, including lapidary and ceramic traditions, reveal continued interactions with groups to the south. I explore this interaction to understand the intent, power, and agency manifested in the decisions to adopt foreign elements of material culture in some contexts and not others.

**Beisaw, April (Vassar College), Jayne-Leigh Thomas (Indiana University) and Krystiana Krupa (University of Illinois)**

**[88]**

*Ethics of Repatriation > Culture of Academic Freedom*

The Native American Graves Protection and Repatriation Act (NAGPRA) is 30 years old, and the generation that opposed its passage is now approaching (or past) retirement age. For professionals that succeed them, repatriation has always been both legal and ethical practice and they must confront legacies of mentors/predecessors who found ways to avoid the regulations and ethics of repatriation. One of us (April) recently realized that her institution never complied with NAGPRA. Initial responses from colleagues asserted that what other professors had (and were doing) was not her business. The culture of academic freedom, and its ethos of mutual protection through ignorance, presented roadblocks to accessing spaces and collections. Jayne-Leigh and Krystiana offer outside responses to that situation and provide examples of how other institutions fail to pursue repatriation after completing required NAGPRA inventories. Together, we offer advice on how to bring collections into compliance by educating those outside of anthropology as to why repatriation is more important than ideas of academic freedom or intellectual property. Deans, provosts, and presidents are the ones who have the power to manifest change and bring institutions into compliance - but anthropologists are the ones who understand what is behind those locked doors.

**Belardi, Juan (Universidad Nacional de la Patagonia Austral), Silvana Laura Espinosa (CIT Santa Cruz - CONICET), Flavia Carballo Marina (CIT Santa Cruz - CONICET) and Luis Horta (Universidad Nacional de Tucumán - CONICET)**

**[6]**

*The Quarry in the Forest: The Case of the Upper Guanaco River (Southern Patagonia, Argentina)*

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

Belcher, William [38] see Jamison, Gregg

**Beliaev, Dmitri (Knorozov Mesoamerican Center, Russian State University for the Humanities) and Simon Martin (University of Pennsylvania Museum)**

**[76]**

*"Serpent Emperor": The Reign of K'ahk' Ti' Ch'ich' and the Origins of Dzibanché Hegemony*

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

Beliaev, Dmitri [152] see Vepretskii, Sergei  
 Beliaev, Dmitri [76] see Viskanta Khokhriakova, Sandra

**Belisle, Veronique (Millsaps College)**

**[45]**

*Beyond Wari Empire and Inka Analogy: Refining Reconstructions of Wari Power in Middle Horizon Cusco*

In the Cusco region of southern Peru, the Middle Horizon has generally been interpreted as a period during which a strong Wari imperial state conquered and then tightly controlled local populations and resources. Research conducted at the large Wari installation of Pikillaqta and at other Wari sites in the neighboring Huaro Valley has long guided these reconstructions of Wari power in the region, providing a one-sided perspective of Wari impact that is heavily based on Inka analogy. In this paper, I discuss different lines of archaeological evidence recently gathered at local settlements that can be used to test the Wari imperial model. Data from regional surveys and excavations at the local center of Ak'awillay show that far from being dominated by Wari colonists, local communities continued to obtain goods from centuries-old exchange networks and maintained power over the ritual realm. The paucity of Wari items at some distance from Wari installations in Cusco further suggests that local elites did not depend on Wari goods to display their status. These results should encourage us to move beyond the application of an Inka imperial model to the Wari, focusing instead on the multidirectional relationships that linked local communities and Wari colonists.

**Bellia, Angela**

**[176]**

*Aural Experiences in the Performative Spaces of the Past*

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

Bello, Charles [109] see Nolan, Kevin

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

**[46]**

*Dating Changes in the Fashion of Fancy Footwear in the Ancient Southwest: New AMS and Relative Dating of Twined Sandals in the Chaco and Post-Chaco Eras*

For over a century archaeologists have marveled at the intricacy and complexity of the twined yucca sandals recovered from dry cave settings and trash deposits in the San Juan River drainage of the northern US Southwest. Since pioneering work by Alfred Kidder in the 1920s, scholars have recognized that twined sandals represent a pinnacle of ancestral Pueblo weaving traditions in terms of the complexity of their woven structures, labor expenditure required to produce, and ability to express complex aspects of identities. Until now, however, efforts directed at understanding how they were made, used, and their function in ancestral Pueblo society have received less attention, particular for the versions made during the Chaco and post-Chaco eras (AD 850–1300). Based on recent stylistic, technological, and contextual analyses of over 280 sandals from great houses and cliff dwellings across the region, and 30 new AMS dates, this research explores how twined sandal production and use changed over time. This presentation explores the roles that these sandals played in expressions of identity, social position, and group affiliation across the Chaco world and in the wake of its reorganization.

Bellorado, Benjamin [26] see Schleher, Kari  
 Bellorado, Benjamin [26] see Schwindt, Dylan

**Belmar, Carolina (Universidad de Chile)**

**[114]**

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

Research on the use of plants among hunter-gathering groups has made visible the use of a predictable and ubiquitous resource that is locally and seasonally available, and that count with multiple potential uses. Recent studies at the Baño Nuevo 1 site (Aisén, Chile) have revealed that even though these groups based their diet on the consumption of terrestrial fauna, the archaeobotanical record has indicated the consumption of plant resources as a supplementary food. And residue studies show the use of stone tools in the collection, processing, and use of plant resources. For this presentation we shall compare the archaeobotanical record (fruits and seeds and residues/microfossils in stone tools) of three steppe hunter-gatherer sites that have a long occupational sequence: Baño Nuevo 1 (10,750–3100 cal years BP) and Cueva La Vieja (12,000–130 cal years BP) in the Ñirehuao basin, and El Chueco 1 (11,500–180 cal years BP) in the Cisnes basin, in order to evaluate, in a large spatial and temporal scale, the appropriation, processing, and use of plants among steppe hunter-gatherers, considering the multiple potential uses that these resources have within these societies.

Benavente Escóbar, Carlos [89] see Combey, Andy

**Benden, Danielle (Driftless Pathways, LLC)**

[110]

*Moderator*

[110]

*Discussant*

**Benedict, Laura**

[33]

*Zooarchaeological Analysis of Subsistence Practices at the Lake Roberts Vista Site (LA71877), Gila National Forest, New Mexico*  
Faunal subsistence practices remain understudied throughout the Mimbres region, even as the general pattern of large-mammal resource reduction through time is known. This poster documents the faunal subsistence practices at Lake Roberts Vista (LRV), a Mimbres site occupied during the Late Pithouse (LPH) and Classic Mimbres (CM) periods (AD 550–1130). I also compare the LRV subsistence practices with five contemporaneous sites within the Mimbres region, chosen to represent a broad range of elevations and environments. During the LPH-CM periods, LRV experienced changes in domestic architecture (pithouse to pueblo) and settlement patterns (semi-mobile to sedentary) and an increase in population and dependence on agricultural products. The LRV site is above the Sapillo Creek, a tributary of the Gila River, and is set within an environment more favorable for *Artiodactyla* populations than in the Mimbres Valley. As well, the inhabitants of LRV remained seasonally mobile far longer than those in the Mimbres Valley.

**Bennett, Ryan**

[78]

*The Patterns of the Drums: An Evaluation of Iconographic Variation in Dong Son Drum Motifs of Vietnam*

One of the larger debates in studies of Bronze age Vietnam is the symbolic meaning of Dong Son drums. However, in the academic haste to find this overarching meaning there are several questions that have been left unanswered regarding iconographic variation. In this paper, it is my goal to address the iconographic variability of these drums and explore the roles of cultural influences and time on this variability. To conduct this research I shall be using materiality. This research uses a sample of 115 drums from locations across Vietnam to explore the variations in dimensions, motifs, locations, and age. In addition to the archaeological evidence, I explore the histories of cultural groups associated with these drums and their neighbors.

**Benning, Maxwell (Northern Arizona University), Eric Gilmore (Northern Arizona University), Mitchell Cleveland (Northern Arizona University), Chrissina Burke (Northern Arizona University) and Kelsey Gruntorad (Northern Arizona University)**

[26]

*Opportunity in the Garden: An Analysis of Zooarchaeological Materials from Southwest Agricultural Sites*

This research provides a biogeography of animals using zooarchaeological remains on the Colorado Plateau, a geographical region encompassing the Four Corners. The data are used to develop an environmental reconstruction for the northern Southwest to examine the conditions in which agriculture developed, specifically the human exploitation of animals in agricultural fields. This research includes zooarchaeological data stored at the Museum of Northern Arizona (MNA) from four locales: the Coconino National Forest, Navajo National Monument, Wupatki National Monument, and Walnut Canyon National Monument. Faunal analysis includes taxonomic identification, using skeletal features and materials from comparative faunal collections at both the Northern Arizona University, Department of Anthropology, Faunal Analysis Laboratory (NAUDAFAL) and the Charles L. Douglas Vertebrate Zoology Collection at the MNA. This poster presents the resulting data and demonstrates the relationship humans maintained with wild animals, further supporting the Garden Hunting hypothesis.

Benning, Maxwell [26] see Gilmore, Eric

**Beramendi-Orosco, Laura (Instituto de Geología, UNAM), Linda Manzanilla (Instituto de Investigaciones Antropológicas, UNAM), Ana Soler-Arechalde (Instituto de Geofísica, UNAM) and Galia González-Hernández (Instituto de Geofísica, UNAM)**

[50]

*A High-Resolution Chronology for the Palatial Complex of Xalla Combining a Bayesian Radiocarbon Model with Archaeomagnetic Ages*

A high-resolution chronology for the palatial complex of Xalla, excavated by L. R. Manzanilla from 2000 to 2019, was constructed combining archaeomagnetic dates, a Bayesian radiocarbon model, and detailed information about sample type and archaeological context. The Bayesian model, calibrated using the OxCal 4.3 program (Bronk Ramsey 2009) with the IntCal\_13 calibration curve (Reimer et al. 2013), includes 42 radiocarbon ages grouped in 6 phases. The first group includes samples from the roofs of large precincts with ages earlier than expected for classic Teotihuacan period, suggesting a problem of inbuilt age (McFadgen 1982). The 11 archaeomagnetic ages were classified in unburned samples, related to the time of manufacture, and burned samples, related to fires either by rituals or during the Big Fire associated with the abandonment of the site. The calibrated ages have more precise intervals, allowing to distinguish different phases. By contrasting with the archaeomagnetic ages, it was possible to identify the different construction phases and to confirm that big beams had inbuilt ages ranging between 50 and 250 years. It is concluded that by combining these two dating methods and understanding the moment that each sample type is dating, it is possible to obtain solid and precise chronologies.

Beramendi-Orosco, Laura [50] see Soler-Arechalde, Ana

Beresford-Jones, David [128] see Morrisset, Sara

Bergin, Sean [10] see Snitker, Grant

**Bergman, Stephanie (Valles Caldera National Preserve), Kelsey Reese (University of Notre Dame), Anastasia Steffen (University of New Mexico) and Nicholas Jarman (Valles Caldera National Preserve)**  
[35]

*First Came the Fires: Valles Caldera Landscape Futures in a Changing Climate*

The Jemez Mountains in north-central New Mexico have experienced devastating wildfires due to the intersection of climate change and twentieth-century forest management practices. In the past decade 63% of the Valles Caldera National Preserve and 50% of recorded archaeological sites have been exposed to some type of unplanned fire event. Here, climate change impacts are not a question of if, or when, but what now and what next? This poster addresses how the proactive management of cultural resources is possible through the development of a geospatial model that assesses cultural resource vulnerability on the landscape-scale and prepares for potential risks both from wildfire and from landscape-scale restoration projects designed to decrease catastrophic wildfire. The assessment and modeling tool developed for Valles Caldera National Preserve is based on a three-tiered approach, including (1) quantifying vulnerability of known archaeological sites, (2) utilizing real-time data to model fire exposure, and (3) predicting the location of unrecorded cultural resources. We present the preserve's preparation for prioritization with due consideration for the relative value of this archaeological record dominated by prehistoric lithic scatters within the context of myriad and monumental challenges facing archaeologists at global scales.

**Berikashvili, David (International Archaeological Center of the University of Georgia)**  
[168]

*Cultural Transitions through the Centuries in the South Caucasus (New Archaeological Data from Samshvilde)*

Samshvilde in the South Caucasus (Southern Georgia), is a complex and multi-period archaeological site. The historical city occupies an impregnable location on a basalt cape flanked by the deep gorges. This distinctive landscape, combined with environmental conditions and abundant natural resources, have attracted humans for millennia. Samshvilde and its surroundings have been inhabited since the Neolithic era, but the urban complex dates mainly to the medieval period, under Armenian and then Georgian control, when it became the region main fortress and political center. Recent archaeological and bio-archaeological studies of the site revealed the oldest stratigraphic contexts, which are represented by Neolithic and Bronze period contexts. The stone and bone industry of Samshvilde, characteristic for the Caucasian Neolithic gives a new understanding for transitional period from hunter-gatherers to early agricultures. Also, the discovery of the Late Bronze cemetery in Samshvilde is an important phenomena for understanding the cultural processes at the end of second millennia BC. Future expansion of the project, priorities, as well as the methods of conservation will be presented. The results of the studies of medieval Samshvilde, located at the Armenian-Georgian border will be also presented.

Berna, Francesco [191] see Kulick, Rachel

**Bernard, Henri (Universidad Veracruzana) and Sara Ladrón de Guevara (Universidad Veracruzana)**  
[107]

*Stone Figurines of the Middle Formative in Mesoamerica*

The first reported green stone figurines from controlled excavations in Mesoamerica occur in Middle Formative (900–400 BC) contexts. Among the best known are those from Offering 4 at La Venta. Mid-twentieth-century excavations at La Venta, conducted by Mathew Stirling, Philip Drucker, and Robert Heizer, also produced the largest number of in situ figurines found. Few other examples have been found outside this site, in places like Arroyo Pesquero or Cerro de las Mesas. This presentation will address the range of objects reported with archaeological contexts, to observe the temporality, region where they appear, and their associated elements. A stylistic analysis on figurine will be presented and compared with the definition based on the observations made by various authors to see if all the objects can be included in the same style. In addition, we will distinguish similarities and differences in their final deposition, to observe possible relationships with documented Mesoamerican rituals for other regions and temporalities.

**Bernstetter, Jessica (University of Missouri)**  
[167]

*Architectural Visibility Analysis: Understanding Domestic Space in Roman Pompeii, Italy*

This paper will discuss the methods involved in utilizing visibility analysis to understand how space was used in domestic contexts. Although visibility studies are frequently used in archaeology, and wider applications of GIS, this paper presents a unique application of visibility analysis for studies of architecture, space, and social interaction. While other research has attempted to display and analyze the use of space in various contexts, most studies are limited to qualitative types of analyses. The purpose of developing the architectural visibility analysis was to create a method of displaying and analyzing areas of visibility within an enclosed space. Using architectural visibility analysis, we can quantitatively assess areas of visibility given a set of observer points. This new method provides an objective analysis that can be applied to the interior of buildings or other constrained spaces and does not require the open environment that is typically characteristic of viewshed analysis. Using domestic properties from Pompeii, Italy, as a case study, I will demonstrate the effectiveness of using architectural visibility analysis and its potential for broader applications.

Bernstetter, Jessica [167] see Trusler, Kate

**Berquist, Stephen (University of Toronto)****[45]***Discussant***[45]***Chair***Berquist, Stephen (University of Toronto)****[69]***Assembling an Architecture of the Ayllu: Political Sequence, Historical Process, and Emergent Institutions at the Middle Horizon Site of Tecapa, Jequetepeque Valley, Peru*

The late Middle Horizon site of Tecapa, in the southern Jequetepeque Valley, comprises a series of monumental compounds abutting a Late Moche huaca. Although the architecture resembles the orthogonal cellular style that has come to be associated with imperial Wari centers, extensive excavations have revealed no sign of Wari occupation. Instead, material culture indicates alliance and eventual syncretism between coastal peoples and a small enclave of highlanders from the nearby Cajamarca highlands. While some scholars argue that Wari maintained Cajamarca as a client state, I take this opportunity to reexamine the basis on which we have constructed Wari as an expansive imperial power. My review of the literature demonstrates that the architectural style attributed to Wari predates the Middle Horizon across a wide region in north central Peru. In fact, orthogonal cellular sites to the north of Wari itself show almost no corroborating evidence for Wari occupation beyond the architectural style. Though some archaeologists interpret gridded planning as evidence for a centralized administrative strategy, I show that histories of gridded planning in Eurasia do not support this argument. Instead, I suggest that Tecapa—and other planned orthogonal sites—denote the emergence of a new model of political organization

Berrier, Margaret [158] see Nicolay, Scott

Berryman, Judy [37] see Walker, William

Berube, Eloi [181] see Johnson, Lisa

Bestock, Laurel [36] see Rothenberg, Miriam

**Bevan, Andrew****[92]***Computational Models of Human Settlement Behavior: An Overview of Current Methods and Motivations*

Computational models of human settlement have been noticeable features of intra- and interdisciplinary research for several decades, whether such models focus on the present day, on the historically documented near-present, or on deeper archaeological time scales. Now is a useful moment to revisit the pedigree of these different strands of research, as well as what problems and potential they hold today and what problems they seek to address in future. This paper leaves to one side those models primarily concerned with the “pure prediction” of past settlement intensity (e.g., those intended to predict and protect dwindling heritage resources: a very important but different objective), and instead will take stock of where we are in terms of developing computational models that help us understand issues such as changing locational priorities in the past, the emergence or disintegration of settlement sizes and hierarchy, altered subsistence or territorial strategies, or indeed patterns of short- or long-distance cultural and economic interaction. Emerging from an exciting and diverse range of settlement modeling applications today are also several persistent challenges in urgent need of wider debate.

**Bey, Bridget (Washington University in St. Louis) and Jane Buikstra (Arizona State University)****[67]***Puberty in Precontact Illinois: An Evaluation of Pubertal Timing in Middle and Late Woodland Native American Adolescents***[WITHDRAWN]****Bey, George (Millsaps College)****[61]***Discussant***Bhattacharyya, Tiyas (University of Oregon), Alison Carter (University of Oregon), Miriam Stark (University of Hawai'i, Manoa), Peter Grave (University of New England [Australia]) and Lisa Kealhofer (Santa Clara University)****[150]***Angkor from the Outside In: Incorporation into the Angkorian State as Seen through the Distribution of Stoneware Ceramics*

Incorporation into and connectivity within the Angkorian state (ninth–fifteenth centuries CE) has been studied through the construction of large temples and road/water networks across sites in mainland Southeast Asia (e.g., Hendrickson 2008, 2010; Pottier et al. 2012). However, few scholars have examined how areas outside the urban core interacted with the capital at the household level. Khmer stoneware ceramics were circulated strictly within the Angkorian polity and used for a variety of domestic

activities (e.g., Chhay 2013; Ea 2013; Rooney 2000). Due to this, they can be used as a proxy for understanding how connected households in provincial areas were to Angkorian stoneware ceramic circulation networks. Here, I present the results of a study of ceramic assemblages from habitation mounds excavated around Prasat Basaet in Battambang, Cambodia. By examining the types and proportions of stoneware ceramics, I found that households at Basaet had a smaller percentage of stonewares and different types of glazed stonewares than similar households within the capital. Results from compositional analysis using NAA revealed that stonewares found at Basaet came from several Angkorian kilns. Overall, this preliminary study demonstrates the importance of studying provincial areas as a means of better understanding the Angkorian state economy.

**Bianchi, Pablo (CONICET - IMHICIHU)**

[68]

*Complementary Use of Spaces in Central-South Argentinian Patagonia during the Late Holocene*

The aim of this study is to explore raw material circulation between the Southern Deseado Massif and the nearby open spaces focusing on the late Holocene assemblages. This period is characterized by fluctuations in climate between dryer and wetter conditions. Consequently, this situation could have affected the distribution and concentration of food resources in areas that have diverse environmental characteristics. Differences in water availability could have also played an important role in subsistence strategies. Recently obtained radiocarbon dates indicate the synchronic occupation of both areas. Lithic assemblages recovered in surface recollections on both spaces were analyzed in order to evaluate their technological variability and raw material composition, focusing on tools which can be attributed to the Late Holocene according to their morphological and technological characteristics. This information allowed us to establish a differential transport of lithic resources between the former spaces. In the light of these results, a complementary use of these distinct environmental units by hunter-gatherer groups is proposed, as a response to variable climatic conditions during a moment of effective occupation of this space.

**Bicho, Nuno (Universidade do Algarve), Jonathan Haws (University of Louisville), João Cascalheira (ICAREHB, Universidade do Algarve), Célia Gonçalves (ICAREHB, Universidade do Algarve) and Mussa Raja (Universidade Eduardo Mondlane)**

[124]

*Stone Age Archaeology in the Elephant River Valley, Southwestern Mozambique*

Located between modern-day South Africa and Tanzania, both of which have well-known and extensive Stone Age records, Mozambique and its Stone Age sequence remain largely unknown in the broader context of African Pleistocene prehistory. This is despite the country's critical position linking southern and eastern Africa, and of its clear potential to inform various models about recent human evolution. Here, we present the results of field survey, testing, and archaeological excavation in the Elephant River valley, in the Massingir region of southwestern Mozambique. The Stone Age research took place between 2015 and 2019 and dozens of surface sites were found with ESA, MSA, and LSA assemblages. Three sites were excavated, providing important lithic and organic collections as well as some absolute dates: Mapa, Txina-Txina, and Machampane 1.

Bicho, Nuno [151] see Haws, Jonathan

Bicho, Nuno [21] see Horta, Pedro

Bicho, Nuno [68] see Skosey-LaLonde, Elena

**Bies, Michael (OW Heritage Research L. C.) and Linea Sundstrom (Day Star Research)**

[53]

*Recording and Interpreting Rock Art as a Volunteer*

Jim Keyser has been a key figure in recording and interpreting rock art in Wyoming, Montana, and South Dakota for many years. This paper highlights some of his many contributions in understanding Late Prehistoric and Protohistoric narrative rock art. Jim has expanded his impact on the field of rock art research by providing fieldwork opportunities for volunteers and by promptly making the results available to archaeologists and the public alike. His research and willingness to collaborate have furthered rock art research in the northern Plains and encouraged public appreciation of the region's rich body of warrior art.

Biggie, Michael [23] see Roa, Ian

Biggie, Michael [152] see Walden, John

Billman, Brian [159] see Mullins, Patrick

**Binkley, Megan (University of Wisconsin-Madison, Undergraduate Student)**

[19]

*Late Mesolithic Foodways in Arctic and Subarctic Zones: An Ethnoarchaeological Approach*

Through collaboration with modern populations practicing traditional hunting and foraging approaches in Norwegian coastal landscapes of archaeological significance, I present an ethnoarchaeological analogy for Arctic and subarctic Late Mesolithic coastal exploitation. As part of this analogy, I introduce the Accessibility Zones Model, which delineates the greater fjord landscape into subsections on the basis of physical accessibility, topographical slope, and water depth. I use this model to analyze tripartite correlations between landscape features, resource concentrations, and Mesolithic site preferences. My results support the idea of a Mesolithic preference for regions with flatter, shallower landscapes, with a slight emphasis on areas accessible to both adults and children. Analysis of the sustainability practices espoused by coastal foragers in Norway today further suggests that Mesolithic hunter-gatherers may have conserved coastal ecosystems through the production of shell middens. As a fixed and plentiful source

of calcium, these middens likely supported the reproductive cycles of local mollusk populations. This, in turn, would have bolstered the recovery of shellfish beds from exploitation and encouraged hunter-gatherers to return to the same locations annually as part of their exploitation circuits. Finally, this research highlights the role of juvenile foragers as active and productive exploiters in their own right.

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

[140]

*Bipolar Reduction Revisited*

Over the past 20 years, the recognition and implications of bipolar reduction debitage in the archaeological record have finally been accepted as an important consideration in lithic analysis. Although, this was far from a straight path. In some prehistoric contexts, it is critical that bipolar debitage be recognized to prevent a misinterpretation of aspects hunter and gatherer behaviors related to mobility, procurement, accessibility of tool stone, and the desire for raw materials with specific qualities. Critical factors to be considered are discussed and examples are presented.

**Birch, Jennifer (University of Georgia) and Sturt Manning (Cornell University)**

[130]

*Radiocarbon Chronology-Building and Relational Histories in Iroquoian Archaeology*

This paper summarizes work completed to date by the Dating Iroquoia project. Our aim has been to construct refined regional chronologies for select Northern Iroquoian community relocation sequences through radiocarbon dating and Bayesian chronological modeling, including novel approaches for overcoming the ca. AD 1480–1610 plateau and reversal in the calibration curve. We have not sought to refine regional culture-histories so much as make them obsolete by dating specific village sites and reconstructing occupational histories of both communities and nascent confederacies. The development of enhanced archaeological chronologies has allowed us to re-plot events in ways that have shifted thinking about polity development and population movement in the region from models based on systems-based thinking to approaches that favor relational histories of social and political development. We discuss how new understandings of processes of internal and external conflict and the formation of Northern Iroquoian confederacies have emerged from the working out of refined radiocarbon chronologies. We also highlight the work that remains to be done and suggest future directions for chronology-building in the archaeology of northeastern North America.

**Bird, Darcy (Washington State University), Kyle Bocinsky (Crow Canyon Archaeological Center) and Tim Kohler (Washington State University)**

[39]

*Maize, Construction, and Population Changes: One Way to Identify Sunk Cost Behaviors in Central Mesa Verde*

When the environment changes, sedentary people choose whether to stay and invest more in their current adaptive strategy, or abandon their land and residence to go somewhere with greater opportunities. For a well-understood portion of the upland US Southwest we ask: when the maize niche shrinks, do people continue investing in the landscape (displaying sunk cost behavior) or do they move? Schwindt et al. (2016) identified periods of shrinkage and growth in subregions of the Central Mesa Verde area, where Bocinsky and Kohler (2014) had previously estimated shrinkage and growth in the size of the maize niche. We now compare a population estimate developed using structure counts and ceramic tallies anchored by dendrochronology to the maize niche proxy. Further, in an effort to identify possible sunk cost behaviors when maize niches constrict, we use the dendrochronological record (Bocinsky et al. 2016) to see if people maintain or possibly even increase investment in a less productive landscape.

**Bird, Douglas (Penn State University)**

[165]

*Discussant*

Bird, Douglas [175] see Coddington, Brian

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

[111]

*Movement, the Sacred, and Appropriations: Inka-Carangas Interactions in Sajama, Bolivia*

When the Inka arrived to the Sajama region, they encountered the Carangas, a pastoralist group, living in *pukaras* along a corridor between the coast and the highlands. Based on limited ethnohistoric sources, the Carangas allied with the Inka against the neighboring Pacajes and, in exchange, allowed the Inka to pass through the region. This relationship was marked materially in the Sajama with Inka styled portable goods and limited Inka constructions. It is unclear how exactly the Carangas benefited from Inka imperialism, which is typically marked by reciprocity. This paper argues for the hegemonic control of the Sajama Carangas and the local appropriations of Inka imperialism into the sacred landscape and local political systems. By taking a collective action approach, I argue that the Carangas accepted Inka imperialism as it afforded them protection and allowed elites access to Inka-local goods. This exacerbated local power struggles resulting in increased factionalism that eroded capacity to organize collective action. Evidence of these interactions may be found in the selective consumption of Inka goods, use of Inka high-altitude sanctuaries, and the practice of *ceques* that continued into the historic period.

**Birkett, Courtney (Fort Eustis Cultural Resources Program)**

[25]

*Site Monitoring and Erosion at Fort Eustis, Virginia*



Since 2010 the Fort Eustis Cultural Resources Management staff has been conducting a program of annual site monitoring visits in which each of the 233 known archaeological sites on Fort Eustis is visited regularly. The monitoring program has provided a baseline knowledge of site conditions and regular opportunities to observe any disturbance. In recent years a major focus of the program has been on quantifying and attempting to mitigate the severe erosion experienced by numerous sites along the James and Warwick rivers.

Birkett, Courtney [35] see McDaid, Chris

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

[74]

*Geometric Morphometric Analysis of Hohokam Projectile Points from the Tonto Basin*

Traditional analyses of projectile points often use visual identification, the presence or absence of discrete characteristics, or linear measurements to classify points into distinct types. Geometric morphometrics provides additional tools for analyzing, visualizing, and comparing projectile point morphology. In this study, I compare the effectiveness of semi-landmark analysis vs. elliptical Fourier analysis for identifying discrete clusters of similar projectile points, as well as the overall effectiveness of these methods for detecting patterns of technological similarity at a regional scale. I use photographs of Hohokam projectile points from the Tonto Basin and compare them to published illustrations and photographs of projectile points from other regions of the US Southwest.

[74]

Chair

Bischoff, Robert [195] see Padilla-Iglesias, Cecilia

**Bishop, Anna (University of California Los Angeles)**

[152]

*Internal Variations among the Elite Classic Maya at El Zotz*

This paper discusses the internal structure of the elite Classic Maya at the site of El Zotz, in the Petén region of Guatemala. By examining the behavior of elites living in different parts of El Zotz at the end of the Late Classic, I will consider whether the aristocracy of the Pa'ka'n court acted as a cohesive unit with shared behaviors, or if they were segmented with significant variation in practices between groups. The extent to which nobility differed at the same site, and in what ways they differed, can shed light on the internal organization and relations of the Maya elite at a small royal center. This paper uses material evidence, with an emphasis on ceramics, to ask questions about a variety of behaviors, such as domestic, ritual, and external trade practices.

**Bishop, Katelyn (University of Illinois at Urbana-Champaign)**

[91]

*A Zooarchaeological Reassessment of the Parrots of Chaco Canyon*

Since the earliest recovery of their remains in the 1890s, the parrots of Chaco Canyon, New Mexico, have featured prominently in discussions of Chacoan trade, social complexity, ceremonial organization, and symbolism and ritual. Despite their prominence in interpretations of the canyon's primary occupation (800–1150 CE), the complete set of parrot remains, now scattered in several institutions across the country, has not received thorough zooarchaeological study in over half of a century. Lyndon Hargrave's seminal publication, *Mexican Macaws*, remains the only available source for scholars seeking details of the skeletal remains of these birds. But 50 years later it contains several inaccuracies, outdated numbers, limited discussion of contextual details, and no interpretation of the social significance of these birds. In this paper, I present the results of a complete zooarchaeological reanalysis of all parrot skeletal remains from Chaco Canyon and provide an updated count of the number of individual birds. Through examination of field notes and archival documents, I reconstruct contextual details, revealing new insights into depositional practices. Further, I contextualize the treatment and deposition of parrots relative to other birds found in Chaco Canyon to provide additional evidence for the control of macaws as a valuable ceremonial resource.

[91]

Chair

**Bisulca, Christina (Detroit Institute of Arts), Marilen Pool (Arizona State Museum), Nancy Odegaard (Arizona State Museum), Joshua Henkin (Field Museum of Natural History) and Kristof Cank (UNC Greensboro)**

[133]

*Plant Exudates of Arizona: Use, Properties, and Testing*

In the material culture of the American Southwest, several plant and insect exudates were utilized as adhesives, coatings, paints, and dyes, as well as for medicinal purposes. Their use is described in ethnohistorical and anthropological accounts. However, many of these materials are misidentified in these accounts and subsequently in collection records, often due to problems with nomenclature. As each of these exudates is chemically distinct with different physiomechanical and bioactive properties, correct identification is critical to understanding their use. As part of a long-term study, we are undertaking a comprehensive survey of collections from the greater Southwest from the archaeological to the historic periods. To date, over 300 exudate samples from artifacts across multiple institutions have been analyzed. Concurrently we are investigating the chemical and physical properties of these exudates to gain insight into their processing and application. Understanding these properties combined with use patterns in artifacts is crucial to a holistic understanding of materials selection. Given the limited availability and costs of instrumental analysis, this study also assessed practical, inexpensive methods for characterizing these materials.

[133]

Chair

Biwer, Matthew [45] see Jennings, Justin

**Black, Reece, Nicholas Herrmann (Texas State University) and Todd Ahlman (Texas State University)**

[32]

*Modeling the Past: Using Structure from Motion (SfM) Photogrammetry to Record the Sugar Works of a Station Plantation*

This study utilizes structure from motion (SfM) photogrammetry as a documentation tool to understand the layout and usage of Site SE095, a sugar works, on the Dutch Caribbean island of St. Eustatius. The research goals are to create a spatially referenced 3D model of SE095; identify the foundations, extant structures, and features as they relate to sugar and rum production; and compare the site layout to other sugar works from across the Caribbean. Agisoft Metashape Professional was used to create the model by aligning a photoset of the structural remains. These models are assessed to determine whether there are any identifiable features associated with sugar refining and rum distilling. The building configuration and organization is compared to other plantation and structure layouts from Caribbean plantations with well-documented architectural features. SfM photogrammetry helps improve our recording possibilities because it creates accurate and spatially referenced 3D models.

**Blackmore, Chelsea (Albion Environmental Inc.)**

[60]

*Discussant*

**Blackwood, Emily (University of Maine)**

[68]

*The Ostra Collecting Station Site: A Virtual Reconstruction*

Virtual reality is a tool that can be used to enhance archaeological analyses. My research explores using excavation data to develop a 3D immersive and interactive simulated environment representative of an archaeological site. Incorporating virtual reality in site analyses 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. The Ostra Collecting Station, a mid-Holocene site located in northern Peru, has been an excellent example for this type of technological exploration. The site sits on top of a sea-cliff where the ancient shoreline is visible adjacent to the site limiting accessibility to three directions (from the north, east, or south); however, the present-day shoreline is located 5km to the west, leaving the site with the appearance of being surrounded by desert and accessible from all four directions. The use of virtual reality 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.

Blair, Elliot [137] see Smith, Allison

**Blakeslee, Donald (Wichita State University)**

[21]

*Who Hunted the Most Bison?*

The bison jumps and bison pounds of the Northern Plains are prominent features of the landscape, but conditions are different on the Central and Southern Plains. Early historic documents tell of large long-distance communal hunts conducted from horticultural villages. Thousands of hunters used surrounds to take the animals, but no kill sites of that kind have been detected. Furthermore, transportation costs limited the number of bison bones taken home from the kills, making bone assemblages in villages a poor measure of the volume of bison taken by the residents. This presentation demonstrates means of detecting both large long-distance pedestrian hunts and the intensity of bison processing through analysis of chipped stone tool assemblages.

**Blakey, Michael (College of William and Mary)**

[112]

*Discussant*

Blancas, Jorge [177] see Barba, Luis

**Blanck, Allyson (University of Arizona)**

[88]

*A Service Dog in the Field: Accommodating Disabled Archaeologists and Nontraditional Medical Equipment*

There are many things one expects to find on a field site: a plethora of trowels, interns, and students working away—but disability and medical equipment are not among them. Archaeology often shies away from including and accommodating disabled voices. This fear has created an environment in which those with disabilities are unsure if they will be welcomed or accepted, let alone accommodated. Disability encompasses a broad range of individuals, and many types of medical equipment can accompany disabled individuals. Equipment can range from an acceptable pair of glasses to the traditional symbol of a wheelchair. One often misunderstood, nontraditional type of medical equipment is a task-trained service dog. In collaboration with the Institute for Field Research and the Irish Archaeology Field School, I was granted the opportunity to attend the field school at Ferrycarrig in Co. Wexford with my service dog. In this paper I will describe the process of applying to and attending a field school with a service dog. Along with this, I will provide an introduction to the current state of disability in archaeology, and theoretical actions that might be taken by other field schools hoping to engage with disabled archaeologists in the future.

**Blank, John, Sarah Gilleland (Binghamton University) and Matt Chmura (Binghamton University)****[28]***An Experimental Archaeological Approach to Modeling and Testing Bone Artifacts in 3D Space*

In recent years, 3D modeling has become a more common method for evaluating archaeological materials, as it is a nondestructive method to test how artifacts will handle stress. 3D modeling has advantages over testing of physical artifacts because the exact same artifact can be reused multiple times to test different hypotheses. However, 3D models must be tested against the artifacts they are replicating to be sure that simulated space accurately represents the natural world. Experimental archaeology is therefore a necessary step in determining the veracity of the virtual environment. By testing artifact reproductions both physically and virtually, we compare how artifacts respond to mechanical stresses in both the real and virtual worlds. Focusing on bone fishhooks, we produced and mechanically stressed 15 bone fishhooks based on artifacts curated at the Bernice Pauahi Bishop Museum. Each hook was stressed to breaking in one of three dimensions. The fracture patterns were then compared to the breaks expected when subjected to the same stress in virtual space. The virtual models are subjected to conditions they would experience during use, given the physical properties of modern pig bone. These data provide insight into constructing a more realistic virtual world to test artifacts.

**Blatt, Samantha (Idaho State University)****[161]***Moderator***[161]***Discussant*

Blatt, Samantha [18] see Effingham, Joseph

**Blecha, Erika (Center for Big Bend Studies)****[4]***The Boulder Glyphs: An Analysis of Prehistoric Conflict and Historic Ranching Lifeways along the Big Bend of the Rio Grande*

Located in the Sierra Vieja breaks, a subset of the Chihuahuas Desert near the Rio Grande in far west Texas, are fields of thousands of small vesicular boulders and survey work found some contain petroglyphs. Beginning in the fall of 2018 the Center for Big Bend studies led a thorough investigation and documentation of over 200 petroglyphs pecked into these basalt boulders. The petroglyphs include anthropomorphic and zoomorphic figures, abstract enigmatic designs, and historic brands and initials. The variability in iconography suggests the petroglyphs were made by both prehistoric and historic individuals, offering the opportunity to study a time transgressive phenomenon not reported from the region and with few corollaries outside of the area. The most common themes depicted on the boulders are indigenous intergroup conflict and historic brands. Geospatial analysis indicates patterns in the dataset, and using both ethnographic and historic county records, adjacent site data, and metal detecting has helped form and initial interpretation for these localized petroglyphs. This poster will discuss the preliminary analysis of these boulder glyphs, including the common themes of the images, spatial patterns, and records research.

Bliege Bird, Rebecca [175] see Codding, Brian

**Blitz, John (University of Alabama) and Lisa LeCount (University of Alabama)****[136]***Grinding It Out: Ancient Maya Embedded Economies and Changing Ground Stone Densities in Households at Actuncan, Belize*

In Classic Maya economies, artifact distributions alone do not neatly reflect modes of production and exchange. The simultaneous existence of multiple modes of production (domestic, specialized, ritualized, etc.) and exchange (gift giving, tribute extraction, and markets) in households complicate our understanding of the strength of any given aspect. We utilize a diachronic perspective, multiple lines of evidence, and artifact densities standardized by excavation volume at the site of Actuncan, Belize, to elucidate changes in the strength of production and exchange modes in Preclassic and Classic phases. Our focus is on ground stone densities as a measure of maize-grinding intensity across elite and common households. Data indicate that commoner households always ground more maize than elites, but intensity peaked in the Late Classic period, after which it declined. It is tempting to suggest that this pattern is linked to population decline following the collapse of Naranjo's political power over the nearby provincial center of Xunantunich. However, Actuncan demographics do not change substantially, agricultural fields show improvements, and markets continued to be held in the Terminal Classic period. Therefore, we suggest changes in maize-grinding intensity were due to the shrinking of regional political hierarchies and declining tribute demands.

Bloch, Lindsay [17] see Pavlovics, Victoria

**Blomster, Jeffrey (George Washington University) and Victor Emmanuel Salazar Chávez (George Washington University)****[102]***The Work of Feline Bones and Feline Imagery at Early Horizon Etlatongo, Oaxaca, Mexico*

Large felines play crucial roles in origin narratives, cosmologies, and political authority in Mesoamerican societies, yet actual faunal remains and feline imagery are uncommon for the Early Horizon, from 1400 to 1000 cal BCE, especially in the highlands. Feline imagery appears in the stone sculptural corpus of the Gulf Olmec urban center of San Lorenzo, with both naturalistic examples as well as transforming figures. Feline imagery, however, has not been documented in San Lorenzo's ceramic figurine corpus, nor have large feline bones been reported in the site's faunal corpus. At the highland site of Etlatongo, in the Mixteca Alta of Oaxaca,

Mexico, recent excavations have explored both Early Horizon domestic and public space. Actual large feline bones, possibly from the same young individual, were found in the public space where one bone had been used as a tool; this animal, or parts of it, must have arrived at the site through interaction networks. The public space also yielded ceramic figurines exhibiting feline imagery. We argue that the different media in which felines were materialized, both actual remains as well as ceramic imagery, in a public component of Etlatongo complemented and contributed to increasing complexities in cosmology, ontologies, and society.

[102]

Chair

Blomster, Jeffrey [171] see Breault, Sarah

Blomster, Jeffrey [102] see Clark, Alexis

Blomster, Jeffrey [170] see Salazar Chávez, Victor Emmanuel

Bloomer, William [54] see Lenzi, Michael

**Blumenfeld, Dean (Arizona State University), Rudolf Cesaretti (Arizona State University), Angela Huster (Arizona State University) and Michael Smith (Arizona State University)**

[101]

*Intra-urban Density and Spatial Variation at Ancient Teotihuacan*

The architectural map produced by René Millon's Teotihuacan Mapping Project allows a fine-grained investigation of two features poorly understood for ancient cities. First, we use a kernel density analysis of residential structures to assess the differential population densities of the city. We find that there is considerable variation in local densities within the urban area, which also allows us to estimate the overall boundary of the site. Second, we quantify the way population density declines with distance from the center of the city. The rate of density decline with distance at Teotihuacan matches the decline rate in many contemporary cities. The explanation postulated by urban economists for density decline today (a balancing of rents and transportation costs) is not appropriate for early cities, because they lacked a real estate market. We therefore propose a more fundamental explanation for density decline, based on spatial patterning and minimization of effort, that applies to both modern and ancient cities. Our study provides insights into a variety of issues, including urban sprawl, internal demographic variation, and spatial inequality.

Blumenfeld, Dean [177] see Morehart, Christopher

Bocinsky, Kyle [39] see Bird, Darcy

Boese, Beatrice [17] see Freund, Kyle

**Boileau, Arianne (University of Florida)**

[42]

*The Inside/Outside Connection: A Spatial Analysis of Faunal Remains from Contact Period Maya Elite Structures at Lamanai, Belize*  
During the colonial period, the Maya living in frontier zones retained much of their community-level sociocultural and hierarchical systems. At Lamanai, Belize, recent excavations of three elite residences provide an opportunity to examine the relationship between status and animal use. In particular, one of the structures is hypothesized to be the residential compound of a Maya community head. I investigate if spatial faunal patterns can help separate Lamanai's elite based on their political status (ruling vs. nonruling elite) and provide support for the possible identification of the colonial ruler's residence. To do so, I compare faunal patterns among elite households and consider space use as it relates to activities involving animals. Spatial patterns are examined using taxonomic and skeletal data as well as anthropogenic modifications, such as burning, fracture patterns, and butchery marks. These methods allow me to assess whether different elite households had access to and/or controlled different sets of animal resources (both in terms of taxa or skeletal portions) and engaged in different practices involving animals and animal parts (e.g., rituals, artifact manufacturing, provisioning). Patterns revealed by other artifactual data are also considered. This study provides insight into Lamanai's sociopolitical composition during Spanish contact.

Boisvert, Richard [27] see Oberheim, Paul

**Boles, Steve**

[51]

*Cahokia's Wandering Supernaturals: What Does It Mean When the Earth Mother Leaves Town*

A Cahokia female figurine recovered from Ohio in 1935 was recently brought to light. Although this example is made from limestone, it is identical in all other respects to the Cahokian flint clay suite. Additionally, the limestone was sourced to the St. Louis formation, leaving little doubt as to its origin. This example adds to the growing number of Cahokian female figurines recovered from outside Greater Cahokia and a reevaluation of their role in Cahokian religion is explored via ethnographic accounts and archaeological data.

Bongers, Jacob [159] see Chicoine, David

Bongers, Jacob [128] see Larios, Jennifer

**Bonine, Mindy (AmaTerra Environmental Inc.)****[143]***Introduction to the Headwaters Site, New Braunfels, Texas*

From mid October 2018 to early April 2019, archaeologists from AmaTerra Environmental Inc., Texas State University and the Center for Archaeological Research at the University of Texas at San Antonio conducted data recovery excavations at the Headwaters Site (41CM204), in New Braunfels, Texas. The Headwaters Site is located on a deeply stratified terrace adjacent to Comal Spring, which is the headwater for the Comal River. This perpetual source of water provided and attracted numerous resources for prehistoric peoples in Central Texas, who used the site more or less continuously for at least the last 8,000 years. As such, the remains of such habitations are embedded in the landscape, and excellently preserved. This paper presents the initial results from the excavations at the Headwaters Site, including the 25+ hot-rock cooking features, knapping debris dumps, stone tools, faunal remains, and unique artifacts recovered from the site.

**[143]***Chair*

Bonine, Mindy [25] see Seikel, Katherine

Bonzani, Renee [64] see Manzano, Bruce

**Boomgarden, Shannon (University of Utah), Brendan Ermish (University of Utah), Jordin Muller (University of Utah), Corinne Springer (University of Utah) and Stefania Wilks (University of Utah)****[41]***Actualistic Experiments in Archaeology: Farming and Storing Maize in Range Creek Canyon, Utah*

At the Range Creek Field Station in east central Utah, researchers have had the unique opportunity to conduct repeated actualistic experiments, under modern environmental constraints, to better understand past human behavior related to farming and storing maize. This poster summarizes the goals, expectations, methods, results, and ongoing difficulties of actualistic experiments designed to collect quantitative data on the costs and benefits of growing and storing maize. The data collected under modern environmental constraints is then used to better understand the archaeological record of Fremont farmers living in Range Creek Canyon between AD 900 and 1200. While we have had significant breakthroughs in understanding the trade-offs associated with irrigating with simple tools, we have had major difficulties in other areas of our experiments including pest damage to crops (primarily grasshoppers) and pests stealing food from storage granaries (primarily squirrels and pack rats). Encountering unanticipated problems and making decisions to best mitigate these issues has significantly changed our understanding of the ways past human forager/farmers would have also modified their behavior to increase their productivity. These difficulties have been extremely informative and continue to shape our experiments and future research questions.

**[41]***Chair*

Boomgarden, Shannon [41] see Ermish, Brendan

Boomgarden, Shannon [41] see Muller, Jordin

Boomgarden, Shannon [41] see Springer, Corinne

Boomgarden, Shannon [41] see Wilks, Stefania

**Boric, Dusan (Columbia University) and Paul Duffy (Columbia University)****[97]***Chronological Perspectives on the Spread of Agriculture in Southeastern Europe*

Neolithic studies in Europe have recently seen the impact of two very different sets of approaches to building chronological frameworks using radiocarbon dating. On the one hand, archaeologists have used radiocarbon dates as proxies for levels of human activity on past landscapes by employing summed probability distributions of radiocarbon measurements. This approach has tended to show little concern for the "messiness" of specific site and local level regional histories, largely focusing on the statistical robustness of large series of radiocarbon dates. The other approach has been to use a Bayesian statistical probability framework with site stratigraphies and carefully chosen contexts to build both site-specific and wider regional histories. In this paper, we evaluate the merits of these two approaches by dealing with the chronological record of the Early Holocene southeastern Europe. We discuss how the two different approaches to building chronologies stem from different and sometimes conflicting theoretical perspectives. We highlight how foragers and farmers impact landscapes differently, and how the resulting site visibility impacts each of these methodological approaches. Finally, we warn of the danger of conflating different scales of analysis when building a "big picture" by obliterating the small scale.

**Borreggine, Marisa (Harvard University), Evelyn Powell (Harvard University), Richard Meadow (Harvard University), Jerry Mitrovica (Harvard University) and Christian Tryon (University of Connecticut)****[100]***Paleocurrents in a Least-Cost Pathway Model of Human Dispersal from Sunda to Sahul, 65–45 Kya*

The timing of human colonization of Sahul, potentially as early as 65 ka (up from the previous 42 ka) has revised our understanding of the dispersal of anatomically modern humans (AMH). This movement represents, to date, the earliest known AMH long distance migration by sea, implying significant levels of complex language, marine technology, and colonization abilities. The pathway analysis applied to migration models generally utilizes a combination of eustatic sea level, low-resolution ancient topography, and/or present-day ocean currents. Using robust paleotopography and sea level reconstructions based on geophysical modeling of ice age dynamics and paleoclimate simulations using the Community Earth System Model (CESM1.1.1) and MIT General Circulation Model

(MITgcm), we retrodict paleocurrents for 65–45 ka. The reconstructed ocean currents and topography determine potential pathways for migration from Sunda into Sahul. The least-cost pathway analysis applied to the migration model is a function of time at sea and island-to-island intervisibility. We seek to identify the most favorable time and path of migration into Sahul. We establish a new method for applying cost analysis to migration pathways and lay the framework for estimating paleocurrents using global and regional climate models, while also providing insight into the first peopling of Sahul.

**Borrero, Mario (University of California, San Diego), Luke Stroth (University of California, San Diego), Chad Rankle (University of California, San Diego) and Geoffrey Braswell (University of California, San Diego)**

[89]

*Crumbling Walls: Terminal Classic Maya Collapse and Abandonment of Nim Li Punit, Belize*

This paper will present a synthetic review of the Terminal Classic collapse of the Maya site of Nim li Punit, Belize, based on new data from recent architectural excavations and artifact analysis. These lines of evidence show that around AD 800 the site saw the cessation of elite activities, the halting of new constructions, the disrepair of existing architecture, and ultimately the abandonment of the site. The data presented will illuminate the nature of abandonment of one of the major Southern Belize centers at the close of the Classic period. We will examine theories on the processes of state collapse and consider the archaeological evidence from our site and how it may fit into these narratives. Finally, we will conclude by exploring the possible internal regional dynamics of the Southern Belize Region during this major period of social change and transformation.

Borrero, Mario [23] see Stroth, Luke

Bos, Kirsten [182] see Nelson, Elizabeth

**Boshoff, Jaco (IZIKO Museums of South Africa)**

[146]

*Archaeological Identification, Investigation, and Implications of the Portuguese Slaver São José Paquete de Africa*

In December 1794 the São José Paquete de Africa foundered near Cape Town, South Africa, while transporting over 500 slaves from Mozambique destined for northeastern Brazil, resulting in the death of over 200 souls. This presentation reviews the process through which independent lines of archaeological and archival evidence were mustered to locate and identify the shipwreck, and reviews the ongoing archaeological finds on the site since its identification. It also examines how this work is pioneering new approaches in maritime archaeology on several interrelated and mutually informing fronts, including technical understanding of shipwreck environments and site formation processes, critical interrogations of the concept of "archaeological site" itself, and modalities of engagement with stakeholder communities including descendant communities in South Africa and Mozambique.

Boshoff, Jaco [146] see Lubkemann, Stephen

Boss, Olivia [40] see Fahey, Brian

**Boswell, Alicia (UC Santa Barbara)**

[106]

*Communities of Practice of Metal Craftspeople on the North Coast of Peru, First Millennium CE*

This paper utilizes a Communities of Practice perspective to explore knowledge transmission of gilding technologies between craftspeople of the Moche and Vicus cultures during the first millennium CE on the north coast of Peru. Craftspeople played seminal roles in the production of metal objects with political and religious authority worn and used by elites in life and death. Archaeological, experimental, and technical studies have allowed researchers to reconstruct some metal production processes in this region; however, we know comparatively little about the social standing of metal craftspeople, how their craft was learned, access to technical and esoteric information, and relationships with elites and sociopolitical institutions. While some of this information is beyond what can be documented in the archaeological record I propose integration of data from metallurgical studies, contextual and ethnohistorical information on this craft and its communities to elucidate on different communities of practice among Moche and Vicus metal artisans. In particular I examine gilding techniques, materials, and forms that reflect the intersection and differentiation of knowledge communities, learning and interaction between groups, and sociopolitical institutions.

[106]

*Chair*

**Both, Adje (University of Huddersfield)**

[84]

*Teotihuacan Sound Mapping: Exploring the Sonic Sphere of the City of the Gods*

The Teotihuacan Sound Mapping Project explores the role that sound and music played in the ancient urban environment of the site. The sound tools and musical instruments of Teotihuacan are re-created and played in different architectural settings, and the instrumental and architectural acoustics subsequently analyzed. With the aid of georeferenced sound mapping and multimedia applications, a virtual sound-map of the city and a soundwalk event for the visitors is created. The research explores new applications of experimental music-archaeological and archaeoacoustical research.

Bouasisenpaseuth, Bounheuang [150] see White, Joyce

**Boulanger, Matthew (Southern Methodist University), Ian Jorgeson (Southern Methodist University) and Michael Adler (Southern Methodist University)**  
[145]

*The Roots of Lithic Exchange Routes in the Taos Region*

This presentation uses lithic-sourcing data from two large northern Rio Grande Pueblo communities, Pot Creek Pueblo (1250–1320 CE) and Picuris Pueblo (1000–Present CE), to delve into the social and economic dynamics that shaped the exchange of obsidian and chert over the past millennium in the Taos region. Drawing on data from over 2,000 pieces of debitage and tools, we detail significant shifts in the use of, or access to, obsidian sources in northern and central New Mexico, as well as high-quality cherts on the Southern Plains and beyond. Changing residential emphases, social organizational schemes, and later colonial disruptions of long-standing exchange partnerships are considered as potential explanations for the long-term shifts in obsidian exchange in the region.

**Boutin, Alexis (Sonoma State University)**  
[112]

*Discussant*

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

[32]

*Exploring Enslaved African Lifeways: An Isotopic Study of an Eighteenth-Century Cemetery (SE600) on St. Eustatius, Caribbean Netherlands*

Multiple isotope analyses of skeletal tissues are a useful tool for exploring lifeways of past populations. Isotopic analysis of Caribbean populations is still in its infancy, making the technique a useful tool for learning about these populations. St. Eustatius is a small island in the Dutch Caribbean that served as the cornerstone for trade throughout the region. This study examines the lifeways of enslaved and free Africans residing on the island using stable isotope analysis. An analysis of diet, nutrition, and residential history of 11 individuals buried at Site SE600 was completed using carbon, nitrogen, and oxygen isotopes from bone collagen and bone bioapatite. The analysis results demonstrate significant variation in oxygen isotopic values from expected values for the region suggesting the people interred in the cemetery did not grow up on St. Eustatius. The nitrogen isotopic analysis results indicate a dependency on marine resources for protein.

**Bowers, Jordan (University of Texas, Austin)**  
[108]

*Understanding Textile Production at Cividade de Bagunte*

Textiles are a near ubiquitous feature of human society from antiquity through present-day. Unfortunately, most places around the world do not have the environmental conditions that allow for the preservation of textiles and the many tools associated with textile production. At Cividade de Bagunte, the only evidence for textile production consists of loom weights and spindle whorls, which represent only a small fraction of the tools that would have been necessary to produce textiles. In this paper, I analyze the spindle whorls and loom weights recovered during excavations at Bagunte, as well as what is missing from the archaeological record, to make broad interpretations regarding the modes of textile production at the settlement in order to understand how Bagunte's inhabitants produced textiles from raw materials.

**Bowland, Lucyna (University of Arkansas), Samuel Martin (University of Arkansas), Dominique Langis-Barsetti (University of Toronto), Joseph Lehner (University of Sydney) and Nicolle Hirschfeld (Trinity University)**  
[191]

*A Three-Dimensional Geometric Morphometric Analysis of Iron Oxhide Ingots from the Cape Gelidonya Shipwreck*

Geometric morphometric-based landmark analyses have long been used as a method for quantifying the shape of biological datasets, but their utility for non-biological samples is often overlooked. The Cape Gelidonya shipwreck, dated to 1200 BCE, contained cargo consisting of over one ton of fragmentary and complete copper oxhide ingots originally classified by George Bass into types based on qualitative analyses of ingot shape. The remains offer an ideal sample for testing the efficacy of landmark-based analyses of non-biological data. Here, we test whether landmark-based analyses are sufficient for discriminating previously established ingot typologies. Ingots were analyzed as both complete and quarters to find the minimum recoverable amount needed to determine ingot type. A total of 114 and 26 landmark points were placed across both faces of 3D virtual renderings of complete and fragmentary oxhide ingots, respectively. Landmark data were then subjected to a principal components analysis of Procrustes shape variables. Results indicate that landmark-based analyses accurately discriminate complete ingots, while landmark analyses of ingot quarters are not diagnostic for classifying ingots according to type. Future analyses will focus on determining the minimum amount of recoverable ingot needed to be diagnostic according to established typology.

Bowman, R. Doyle [187] see Beach, Sonya

**Boyadzhiev, Kamen (National Archaeological Institute with Museum - Bulgaria)**  
[174]

*Tell Yunatsite, Southern Bulgaria: New Insights on the Fifth Millennium BC in the Balkans*

The prehistoric tell at Yunatsite in the Maritsa River valley (Southern Bulgaria) is among the biggest tell sites in the Balkans. During large-scale excavations a medieval cemetery, fortification from the Roman period, and layers from the Iron Age, Early Bronze Age

and Chalcolithic have been revealed. The studies in the last years have concentrated on the thick Chalcolithic layer (fifth millennium BC). They reveal a complex settlement and social structure. The tell itself is actually the fortified part of a larger settlement that emerged around the beginning of the fifth millennium BC. Long-distance trade and craft specialization have been attested. The copper tools and pottery crucibles suggest local metallurgical production, while a small golden bead dated to the mid-fifth millennium BC is one of the earliest golden artifacts known so far. The final Chalcolithic settlement was destroyed by an enemy attack around 4200 cal BC and provides important evidence for the end of the Copper Age cultures in the Balkans. The presentation highlights the most interesting results from the latest excavations and their significance for understanding the cultural processes, technological innovations, and social dynamics in the fifth millennium BC Balkans.

**Boyd, Charles (Radford University), Donna Boyd (Radford University) and Victoria Cristwell (Radford University)**

**[184]**

*A Temporal Perspective of African American Health Disparities Based on Bioarchaeological Evidence: The Effect of Racial Inequality on Disease Comorbidities and Mortality from Slavery to COVID-19*

African American COVID-19 mortality rates are currently up to four times higher than those seen in Caucasians, owing to a myriad of biosocial variables. Higher frequencies of diabetes, heart disease, and obesity comorbidities in African Americans are intertwined with a long-standing history of racial inequality. This paper takes a temporal perspective in examining African American health across a period of over 400 years in the eastern United States. The archaeological, historical, skeletal biological, and mortuary records of antebellum and post-emancipation African Americans are used to examine change over time in health, mortality, and susceptibility to disease and associated comorbidities. Improvements in health after emancipation were very slow in coming, and current African American health still lags behind that of Caucasians for a variety of reasons, primarily economic and social. This paper specifically addresses some of these differences and their historical causes, with a focus on slavery in Virginia. The current disparity in health outcomes across these populations is clearly the result of over 400 years of political and racial inequality.

Boyd, Donna [184] see Boyd, Charles

Boyle, Douglas [6] see Grund, Denay

**Boyle, Nathan (Metcalf Archaeological Consultants Inc.)**

**[160]**

*Discussant*

**Bracamonte Lévano, Edgar (MUSEO TUMBAS REALES DE SIPÁN)**

**[69]**

*Ritual Areas in Santa Rosa de Pucará and Its Implications in Territorial and Sociopolitical Dynamism in Lambayeque Valley, AD 650–950*

Santa Rosa de Pucará is a ritual monumental area in Lambayeque Valley. Recent researches show us an increase in ceremonial practices, from 670 CE (Santa Rosa Phase 1), especially human sacrifices, changes in burial patterns, and the arrival of foreign materials (obsidian and Cajamarca and Wari pottery). In Santa Rosa Phase 2 (750 CE), ceremonial architecture keeps local traditions, but Cajamarca and Wari pottery increases, and Mochica style keeps varying. In Santa Rosa Phase 3 (850 CE) occurred a drastic change in ritual areas. A D-shaped Wari structure appears, and Cajamarca pottery has striking decrease. It shows us a short time of Wari predominance, although it is not clear yet. Santa Rosa Phase 4 (900 CE) is remarked by the D-shaped structure destruction. On the other hand, orthogonal architecture, burials with different orientation, and a funerary chamber of an elite woman with Mochica patterns appear. Evidence of ritual areas points to be the main reason to generate territorial dynamism and sociopolitical transformations from mobility of population and the integration phenomenon that occurs in ceremonial activities. I will explore sociopolitical implications in Mochica local elite when Santa Rosa de Pucará got a religious prestige and became a social interaction focus.

**[69]**

*Chair*

**Bradley, Erica (University of Nevada, Reno), Geoffrey Smith (University of Nevada, Reno) and Christopher Jazwa (University of Nevada, Reno)**

**[27]**

*Early Holocene Site Structure at the Little Steamboat Point 1 Rockshelter, Oregon*

The Early Holocene component at Little Steamboat Point 1 (LSP-1) Rockshelter consists of flaked stone tools, debitage, ground stone, fire-affected rock, and abundant animal bones. It indicates suggest that people systematically butchered ~1,000 rabbits and hares, constructed cooking features, occasionally processed plants, and manufactured and discarded stone tools over a brief but intense interval. Given this high-resolution record, we focused on addressing questions related to how many people used the site, how often they visited the site during the Early Holocene, and how they organized their activities inside the shelter. We developed a stratigraphic dating model and employed spatial analytic techniques including Ripley's K and k-means cluster analysis. Our results indicate that small groups reoccupied the shelter over a 175–420-year period, concentrating their activities in different parts of the shelter over time. Patterning in stone tool discard and cooking activities are consistent with ethnographic accounts of rockshelter use.



**Brady, James (Cal State L.A.) and Melanie Saldana (Cal State LA)****[158]***The Constructed Subterranean Confronts Archaeology: Reviewing a Half Century of Ambivalence*

Archaeology has had an ambivalent relationship with the constructed subterranean dating back more than a half century. In the late 1960s, Good and Obermeyer investigated the cave at Oxtotipac, recognized it as man-made, and documented the fact that the material removed in the creation of the cave was used to construct a platform in front of the entrance. Nevertheless, Sanders labeled the Oxtotipac caves as quarries even though the heavy artifact concentration was totally inconsistent with that function. In the 1970s, John Fox recognized that the cave at Utatlan was constructed, was over 100 m long, and terminated under the central plaza but did not consider it important enough to map. In the 1980s, the cave beneath the Pyramid of the Sun at Teotihuacan was found not to be natural and many archaeologists flatly refused to believe it. Starting in the 1990s, large numbers of man-made caves were documented so their existence can no longer be questioned. It is important to call out the field on its long reluctance to accept man-made caves because we expect a similar reaction to the next revelation that small man-made subterranean chambers exist in the thousands across the Maya lowlands.

**[158]***Chair*

Brady, James [158] see Verdugo, Cristina

**Brandl, Michael (Austrian Academy of Sciences [OREA]), Christoph Hauzenberger (University of Graz), Peter Filzmoser (Vienna University of Technology) and Maria Martinez (University of Texas, Austin)****[77]***The Multilayered Chert Sourcing Approach: An Analytical Technique for Chert and Flint Provenance Studies in Archaeology*

Chipped stone tools present an excellent means for gaining a deeper understanding of prehistoric resource management. Successfully reconstructing past economic behavior, however, crucially depends on the ability to trace these materials back to their original sources. While techniques to source obsidian are well established, attempts to generate characteristic "fingerprints" of sedimentary siliceous raw materials such as chert and flint remain in most cases unsatisfying, mainly due to oftentimes high similarities related to their geological formations, and the choices of analytical techniques. Here we demonstrate the Multilayered Chert Sourcing Approach (MLA) combining petrography, microfacies analysis, and geochemistry, to reliably source chert in archaeological contexts. For geochemical analysis, laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) is applied for the detection of trace element concentrations. Geochemical data are evaluated by multivariate statistical methods for optimal source differentiation and the assignment of artifacts to identified source areas. We present case studies that illustrate that it is not sufficient to rely on a single method for chert sourcing, and highlight the potential as well as limitations of the MLA, which has successfully been tested in over 20 projects worldwide.

Brandt, Steven [24] see Kelsey, Brady

Braswell, Geoffrey [89] see Borrero, Mario

Braswell, Geoffrey [23] see Stroth, Luke

**Braun, David (George Washington University)****[58]***Early Pleistocene Behavior and Archaeological Inference: Insights from Experiments*

The archaeology of human origins represents one of the key insights into what it means to be human. Despite this optimistic outlook, the archaeological record represents a dismally preserved record of untranslated objects. Archaeologists have become increasingly good at devising stories about the records of behaviors that our artifacts represent. However, the developments of theoretical models to create expectations about the archaeological record are relatively lacking and poorly applied. As our field becomes increasingly quantitative, we unfortunately begin to focus on the microscopic components of the record with less applicability to broad understanding of behavior. Here I review a few models for how we can draw inference from the archaeological record using hypotheses about expectations of changes in the archaeological record. I describe how different types of "experiments," whether they reflect knapping experiments or agent-based models of behavior, can provide guidance as where we can focus our efforts in the future. I draw from the archaeological record of the Pleistocene, specifically from the Turkana Basin, the Afar Basin, and the material record of the last million years in the Cape Floral region in South Africa.

**Bray, Tamara (Wayne State University)****[106]***(Cross-)Boundary Objects as Imperial Agents: Imagined Communities in the Late Precolumbian Andes*

This paper builds out from the community of practice literature, inflecting it with more emphasis on the agency of objects as active members of such constituencies, and expanding, as well, on Anderson's notion of imagined communities. In it, I aim to think through the more common elements of the imperial Inca ceramic assemblage as (cross-)boundary objects that contributed to the construction of an imagined, transregional community linked through shared culinary practices. Ceramic vessels comprise a medium that was ready-to-hand for Andean peoples for millennia, and one that operated in a realm distinct from that of spoken language. I will investigate the idea of imperial Inca vessels as agents of their own reproduction and dissemination, and as objects around which the illusion of shared identity and imagined communities of practice could have coalesced in the late precolumbian era.

**Bray, Tamara (Wayne State University)**

[157]

*Discussant*

**Breault, Sarah (George Washington University), Jeffrey Blomster (George Washington University), Daniel Pierce (Université Bordeaux Montaigne) and Michael Glascock (University of Missouri)**

[171]

*Local and Imported Ceramics from a Feasting Assemblage at Etlatongo: Preliminary INAA Results*

Instrumental neutron activation analysis (INAA) conducted on a late Middle Formative ceramic sample recently excavated at Etlatongo, in the Mixteca Alta of Oaxaca, Mexico, demonstrates both local ceramic production and regional interaction with the Valley of Oaxaca. A total of 78 vessel fragments dating to the Yucuita phase (500–300 BCE) were recovered from one feature at Etlatongo; of these, 30 were selected for INAA in order to test hypotheses about the origin of particular vessels based on their suspected provenance as determined through visual analysis, with a mix of local and imported vessels, particularly graywares, included. INAA indicates the sample is composed of six groups, and that the vessels are predominantly of local origin. Of 30 vessels, INAA indicates that eight grayware specimens were imported from the Valley of Oaxaca. The remainder were locally produced, including two specimens which were left unassigned in our six groups. The presence of imported vessels and the proportion of local versus imported ceramics from this feature, interpreted as the remains of a feasting event, illuminates relationships between elites at this early urban center with their contemporaries in the Valley of Oaxaca.

**Breiter, Sarah (Northwestern University)**

[123]

*The Landscape Materialized in Late Medieval Houses*

Social and political ideologies are entangled in the management and control of the ecological landscape. When relations between social institutions shift, it impacts how people interact with their local environment. In this paper, I explore how these relationships are visible within the fabric of a building. During the sixteenth and seventeenth centuries, English people were subject to religious conflict, political change, and a shifting economic system. Earlier institutions that governed and controlled access to natural resources had weakened toward the end of the medieval period. An emerging group of wealthy peasants, merchants, and small landowners prospered in and around many of England's market towns. They built, and rebuilt, their houses, benefiting from increased access to building materials from the local landscape. This paper explores a few of the houses built in the market town of Bury St. Edmunds. Embodied in the fabric of each building are entanglements of labor, environmental resources, and power.

[123]

*Chair*

**Brennan, Tamira (Illinois State Archaeological Survey)**

[110]

*Discussant*

Britt, Kelly [86] see Camp, Stacey

**Brittenham, Claudia (University of Chicago)**

[180]

*Art and Experience in Chichen Itza*

Chichen Itza was a city of unprecedented visual complexity in ancient Mesoamerica, a place where innovations in architecture, mural painting, and sculpture, as well as experiments with new media such as gold and turquoise, created an urban landscape unlike any other. In this paper, I will examine the interactions between different kinds of visual programs at the city, as well as the ways that other senses were also engaged in dramatically new kinds of collective experience.

Brizuela-Casimir, Alvaro [178] see Fitzgerald-Bernal, Carlos

**Brochado De Almeida, Pedro**

[108]

*Cidade de Bagunte: Learning Behaviors from Reconstruction and Excavation*

The work of excavation and reconstruction of the Cidade de Bagunte's Iron Age extant structures has revealed traces of earlier structures and refuse pits that provide new evidence and challenge previous interpretations. Similarly, the work of reconstruction and conservation has confronted us with ethical and practical dilemmas. This paper discusses how the new evidence and reconstruction techniques provide information about past human behavior.

**Brock, Amanda (University of Florida)**

[15]

*Exploratory Mapping of Relationships between Late Preceramic Monuments and their Dynamic Environment in the Callejón de Huaylas, Peru*

The Callejón de Huaylas is a valley in the North Central highlands of Peru located in a dynamic environment prone to environmental

hazards such as glacial floods, avalanches, landslides, and seismic activity. However, the abundance of archaeological sites and long-term occupation in the Callejón de Huaylas which spans preceramic to modern times, suggests a complex, ongoing relationship between the occupants of the valley and its dynamic environment. The following poster presents the results of a preliminary and exploratory regional mapping and disaster risk modeling project of late preceramic archaeological sites in the Callejón de Huaylas based on previous survey data, literature review, aerial and satellite imagery, and records of historical and more recent disaster events. Such mapping work has not yet been done in the Callejón de Huaylas. Results from the project serve to consolidate previous archaeological survey results of the region, determine whether archaeological site locations are high risk, and identify evidence of potential geological landscape transformations. Moving forward, results will also serve to guide further in-field survey and excavation research to answer larger questions about the scope of landscape transformation during the Late Preceramic time period and how communities may have responded and interacted with such changes.

Brody, Rachel [153] see Mills, Rebekah

Brooks, Alison [170] see Porter, Joshua

**Brooks, James (UC Santa Barbara)**

**[79]**

*Discussant*

Brooks, Lauren [153] see Mills, Rebekah

**Brotherson, David (Nanyang Technological University)**

**[150]**

*New Perspectives on the Demise of Angkor*

Socio-ecological systems are a useful framework for understanding cultural processes in the past. Angkor, the capital of the Khmer Empire, dominated much of the Southeast Asian mainland from the ninth to fourteenth centuries. Greater Angkor's development and expansion was based on an elaborate water management network, and this paper demonstrates how this infrastructure was a necessary element for Greater Angkor's large-scale urbanism. However, in the face of multiple stressors including unprecedented climate variability, particular modifications to the system would make it less versatile and inherently vulnerable. While these disruptions would render Greater Angkor unsustainable as an urban system, other socioeconomic components of Khmer culture proved more resilient.

**Brouwer Burg, Marieka (University of Vermont)**

**[80]**

*Modeling Preceramic Occupation around the Wetlands of the Low-Lying Coastal Zone*

While the Late Archaic (3400–900 BCE) has received comparably less research attention than the subsequent Maya period, there has been a surge of interest in this important period in the past two decades. In Belize, the majority of Late Archaic or Preceramic finds occur on the surface and lack archaeological context. However, during two recent field seasons, dense stratified Preceramic deposits were investigated at the Crawford Bank site on the shore of the Crooked Tree Lagoon in the low-lying coastal zone of northern Belize. These distinctive deposits of Preceramic stone tools and freshwater shell suggests that foragers developed unique adaptations to this wetland microenvironment, rich with fish, Mollusca, and durable logwood resources but notably lacking in arable land. Lithic use-wear analysis indicates that woodworking activities were common, and a barbed Lowe point suggests spearfishing activities. Combining the archaeology with multiple geospatial technologies, the evolution and nature of these intimate human-environment interactions is examined. Modeling a range of paleoenvironmental data against the distribution of Preceramic tools from Crawford Bank and other parts of this low-lying coastal zone provides a potential means for predicting where incipient agriculture developed as an additional adaptive strategy toward the end of the Archaic period.

**Brown, Amy**

**[18]**

*Community Training and Traditions: Accessing Archaeological Methodology In Creating a Baseline for Trail Stewardship*

Along the base of Muliwai Pali in Waipio Valley, Hawaii the King's Trail gently travels through a traditional cultural landscape rich in *mo'olelo* (story) and genealogy. During the summer of 2020 descendants of Waipio, Muliwai and Waimanu participated in the documentation and mapping of select portions within a 1.5 mile corridor of this *kuamo'o* (trail) from Nenewe Falls traveling *makai* (toward the ocean) as an initiation in renewing our *kuleana* (responsibility/right) as trail stewards. Documentation of the trails style, form, materials, and condition will assist our community in creating a baseline for interpreting our role as stewards of this *ala hula* (well-known path) for future generations. The purpose of this initiative is to re-familiarize lineal descendants with *kuleana* along the trail with the place names, land transaction history, and cultural resources through an active role in trail stewardship to cultivate balance, reciprocity, and health within our community structure. Survey and mapping workshops, focus on improving research literacy, and collaborative research design serves to assist our descendant community in forming a baseline for stewardship as active proponents in preserving this ancestral trail.

**Brown, Emily (Aspen CRM Solutions)****[84]***"They Made Many Tunes": Musical Instruments of the Pueblo Peoples of the Northern Rio Grande Valley*

The distributions of different types of musical instruments across the American Southwest have been generally defined, but little work has been done to tie these data to studies of ethnogenesis, migration, and language groups. This paper examines archaeological, musicological, ethnographic, and historical data on instruments from archaeological sites from the Four Corners area and northern New Mexico in the context of what is known about the movement of different culture and language groups. It presents a more fine-grained analysis of instruments such as wooden and bone flutes, bone whistles, bone and shell tinklers, gourd rattles, clay and stone bells, and bone rasps as they relate to the language groups of the Pueblo peoples of the northern and middle Rio Grande Valley.

**Brown, James A. (Northwestern University)****[120]***A Brief History of Mississippian Period Art Styles in the American Southeast*

Focused stylistic analysis over the past 60 years has made clear that graphic depiction of the creative forces became a vehicle of artistic expression for southeastern societies. Between the 1100s and 1400 such expression was nearly ubiquitous by including, without being confined to, pottery surfaces, marine shell, sheet copper, and stone sculpture. Distinct style arose within major geographical spaces that entered into "conversations" with each other. Thus, structural parallels arose. Each was tied to a distinct life-world that was not entirely interchangeable with others. These life-worlds have become subject to analysis.

**[120]***Discussant***Brown, James W. (Washington State University), James Chatters (Applied Paleoscience), Anna Prentiss (University of Montana) and Steven Hackenberger (Central Washington University)****[39]***Impact of Paleoclimate Variation on the Settlement History of the Columbia-Fraser Plateau through the Use of Summed Radiocarbon Probability Distributions*

Settlement histories of the Columbia-Fraser Plateau have been compiled through the record of riverine villages of the Columbia and Fraser Rivers and their many tributaries. Columbia-Fraser Plateau chronologies have seldom been revisited in the years since their publications in syntheses of the 1980s–1990s. Our analysis of these records uses summed probability distributions of radiocarbon dates and GIS, which allow for a more detailed picture of past settlement activities. SPDs have become the preferred technique for analyzing aggregate radiocarbon dates to determine change in the distribution that are "real" and not artifacts of sampling strategies. GIS, along with radiocarbon dates, documents the change in spatial distribution of villages over time, indicating the establishment, abandonment, and return to villages. Comparison of SPDs with paleoclimate records indicates a correlation between cool periods and the greater intensity of house occupation. Low points in the distributions may indicate periods, which coincide with warmer climatic conditions and may represent relocation from riverine to upland villages. Notable low points in riverine occupation occurred between 4100–3700 cal BP and 2100–1500 cal BP. Revisiting these chronologies with modern analytical strategies paired with ever-more-detailed paleoclimate models allows for a better understanding of the settlement history of the Columbia-Fraser Plateau.

**Brown, M. Kathryn (University of Texas, San Antonio) and Rachel Horowitz (Washington State University)****[61]***Investigations of a Preclassic E Group at Las Ruinas de Arenal, Belize*

The Mopan Valley Preclassic Project began a multiyear project at Las Ruinas de Arenal as part of a larger regional study of the Preclassic social and political landscape in the upper Belize River valley. New excavations of the site's E Group complex and associated ball court have shed light on Preclassic ritual behavior at the site. Several Preclassic burials and offerings were uncovered on centerline within the E Group plaza. Several of the burials were reentered suggesting ancestor veneration activities. We also encountered a number of small postholes on centerline with offerings of jade. Our preliminary data suggests a complex history of ritual activity within the E Group extending back in time to the Middle Preclassic.

**[61]***Chair*

Brown, Margaret [86] see Camp, Stacey

**Brown, Matthew (Farmingdale State College), Cory Look (Brooklyn College) and Reg Murphy (Graduate School and University Center, CUNY)****[194]***Precolumbian Mortuary Practices in Antigua***[WITHDRAWN]****Bruhns, Karen (Fundación Nacional de Arqueología de El Salvador)****[132]***The Maya, the Nahua, and Lower Central America*

In the Terminal Classic and Early Postclassic, Mesoamerican cultures underwent not only political turmoil but also a general renaissance in terms of material culture, including urban planning, architectural forms, ceramics (such as Tohil Plumbate), and the

growth of truly international cults such as those of Tlaloc and Xipe Totec. A marked “internationalization” of elite culture is noticeable from Cahokia in Illinois to southwestern El Salvador, where El Salvador’s first and last precolumbian Maya city flourished for a brief century to century and a half. But what effect did the Early Postclassic of what was at that time the southeastern frontier of Mesoamerica have on the cultures of Nicaragua, eastern Honduras, and Costa Rica? And what influence did these latter cultures have on the Early Postclassic southeastern Maya? These are questions that archaeologists, entirely too prone to ascribe any and every cultural change to some hypothetical migration, have essentially ignored. Some of the answers are there; others remain to be explored.

**Brumbaugh, Laura**

[46]

*Community Structure in Times of Stress and Change: Communal Dining in the Northern Southwest*

The study of community connections becomes ever more important as our current society faces challenges brought on by advancements in technology, unprecedented health crises, and a changing global climate. By studying community events in the past, we can begin to examine the impact of community structure during times of stress and change. This paper presents the results of an examination of community structure via analysis of past communal dining events (or feasting) in the Mesa Verde region of the northern American Southwest. Specifically, I ask how communal events changed as populations reorganized during the period between early Pueblo aggregated villages (Pueblo I) and great house communities (Pueblo II). Patterns in ceramic and faunal remains associated with the use of kivas and pit structures from sites of both periods are used to assess the social functions of community events. These patterns are compared on a site-by-site basis for each time period, and the overall patterns for the two periods are contrasted to show changes in communal events over time. The results of this analysis, when considered alongside the known settlement histories of the sites involved in this study, can indicate how community events both reflect and impact a community’s structure.

**Brun, Catherine (Université de Montréal), Julien Riel-Salvatore (Université de Montréal), Claudine Gravel-Miguel (Arizona State University), Fabio Negrino (Università di Genova) and Jamie Hodgkins (University of Colorado Denver)**

[28]

*Experimental Archaeology as a Method to Replicate the Ornaments of the Arma Veirana Burial: Overview of the Ongoing Experiments*

The discovery of an Early Mesolithic (10,000–9000 cal BP) newborn buried in Arma Veirana Cave (Erli, Italy) is very important both for the rarity of prehistoric newborn burials and for the richness and diversity of its grave goods. Those are composed of 84 perforated *Columbella rustica* and four perforated *Glycymeris* sp. with different levels of use-wear. Our project studies experimentally how they were made and worn, to help situate them within their social construct. To do this, we use experimental archaeology to inform us on the physical constraints and possible techniques involved in the creation of shell ornaments, as well as explore how physical movements may have affected their use wears. This poster will focus on the framework of the experiments in order to showcase the potential of using experimental archaeology in the scientific process. It will present the steps required to produce shell beads similar to the ones found in the Arma Veirana newborn burial as well as those required to replicate their use wear, documented through a microscopic analysis. The poster will also briefly present the results of our experiments and discuss how those may shed light on bead inheritance within prehistoric societies.

**Brunache, Peggy (University of Glasgow)**

[190]

*Discussant*

**Brunso, Karen**

[60]

*Discussant*

Bruwelheide, Karin [55] see Owsley, Douglas

**Buck, Caitlin (University of Sheffield)**

[97]

*Chair*

**Buck, Caitlin (University of Sheffield) and James Zeidler (Colorado State University)**

[130]

*Tephrostratigraphic Correlation and Ceramic Seriation in Bayesian Calibration: A Case Study from Coastal Ecuador*

The radiocarbon record from sustained archaeological field research in the Jama Valley of coastal Ecuador has provided a robust dataset for Bayesian chronological modeling using multiple archaeological sites from a valley-wide landscape. This paper delves into greater detail on the development of the model’s prior probabilities that utilized iterative multi-site stratigraphic sampling coupled with ceramic seriation in order to correlate key events (volcanic ashfalls) and longer phases of cultural occupation across the valley landscape over 3,600 calendar years. While correlation of three principal volcanic ashfalls (tephras) was straightforward in most cases and aided greatly in the initial Bayesian modeling, recent tephrochronological studies on a macroregional scale have identified additional tephras in the Holocene stratigraphic sequence of the Jama Valley that are not readily identifiable in sampled archaeological contexts. Two possible reasons for this are identified, the first being closely spaced volcanic eruptions depositing

different tephra in rapid succession, and the second being cryptotephra in archaeological contexts that may have resulted from human disturbance processes. Potential solutions are proposed that involve new techniques for in-field analysis of volcanic sediments using handheld laser-induced breakdown spectroscopy (LIBS) and/or portable X-ray fluorescence (pXRF) instrumentation.

**Buck, Caitlin (University of Sheffield)**

**[164]**

*Discussant*

Buck, Caitlin [97] see Dye, Thomas

Buck, Caitlin [97] see Moody, Bryony

**Buckley, Christopher (Wolfson College, Oxford)**

**[150]**

*The Past inside the Present: Interpreting Archaeological Evidence of Weaving in Mainland Southeast Asia in the Light of Present-Day Textile Making Traditions*

Woven textiles have played an important role in Southeast Asia both as practical items and markers of status, a role that continues to this day. Many important traditions and techniques, ranging from simple to complex, have survived to the present day, or the recent past. In this paper I will review the archaeological evidence for weaving on the Southeast Asian mainland, consisting of spindle whorls and loom components from burials, and compare it with present-day looms. In particular I will compare archaeological material with a novel phylogenetic analysis of mainland loom evolution. This gives new insights into how loom technologies evolved and spread in the Asia region. I will show that a sophisticated loom with a distinctive warp beam was already present in northern Vietnam around 2,000 years ago, a point that has been overlooked in previous archaeological literature.

Buckley, Michael [9] see Johnston, Elizabeth

Buckley, Michael [29] see Pal Chowdhury, Manasij

Buckley, Michael [72] see Praet, Estelle

Buckley, Hallie [93] see Vlok, Melandri

Buell, Matthew [191] see Fitzsimons, Rodney

Buikstra, Jane [67] see Bey, Bridget

**Bullion, Elissa (University of Pittsburgh) and Sean Greer (University of Missouri)**

**[44]**

*Perceptions of Disability and Care in Early Islamic Central Asia*

In this paper, we apply an index of care approach to a case study of an individual with progressive pseudorheumatoid dysplasia from an early Islamic cemetery at the site of Tashbulak in southeastern Uzbekistan. Joint degeneration and progressive impingement of nerves would have severely limited individual TBK Br08's ability to eat, drink, and stay clean. We situate this individual's needed care within the context of Islamic philosophy and contemporary medical approaches with regard to disabled individuals. The Qur'an and Sunnah address not only the importance of caring for "disadvantaged people" by all Muslims, but also their rights within society, including marriage and ownership of property. TBK Br08 was cared for over a period of several years, and despite requiring increasing levels of care, lived at least into early adulthood. In death, TBK Br08 was buried according to Islamic prescription, in the same manner as other, nondisabled individuals at Tashbulak. Much research on early Islam in Central Asia focuses on the where and when of the religion's spread. This paper seeks to examine the human dimension of early Islam in Central Asia, and create a framework for future studies of disability in the early Islamic world.

**Buonasera, Tammy (University of California, Davis, and Far Western Anthropological Research Group)**

**[31]**

*Considering Women's Tech Choices: Grinding Efficiency and Performance Characteristics of Hunter-Gatherer Milling Tools*

Milling tools were a cornerstone of many plant-based hunter-gatherer economies. Women are often involved in food processing and would have used these tools, in some cases daily, to expand the breadth of foods available for consumption. Despite their important economic role, few studies have compared differences in the performance of various ground stone designs common to hunter-gatherers in California, or elsewhere. Here, experimental small seed and acorn/nut processing rates are compared for three mortar and two grinding slab designs. Results indicate some unexpected relationships between different interior mortar shapes and seed processing. In particular, large mortars with deep and broad interiors are highly effective tools for producing flour from both small wild seeds and large seeds/nuts like acorns. Though expensive to manufacture and transport, mortars with large bowl-shaped interiors would have been excellent for long-term use in settings where multiple types of plant resources were processed into finer particles. Conical mortar shapes are good for acorn processing but poor for processing small seeds into flour. Shallow mortars and small grinding slabs are the least productive but also the least expensive tools.

**[31]**

*Chair*

Buonasera, Tammy [31] see Chen, Caleb  
 Buonasera, Tammy [31] see Ugras, Funda

**Burgess, Blaine, Jeffrey Ferguson (University of Missouri) and Shannon Fie (Beloit College)**

[30]

*Obsidian Technologies at the La Magdalena Site in the Eastern Bajío of Guanajuato, Mexico*

Archaeologists attribute many possible connections between the Bajío and Basin of Mexico during the Formative through Postclassic periods. Elemental analysis of obsidian from the site of La Magdalena (Q-25) in the eastern Bajío region of Mexico both support and challenge different aspects of these connections. Excavations conducted by Beloit College in 1958 and 1960 highlight three primary phases of occupation at La Magdalena, which all show some degree of cultural influence from Cuicuilco, Teotihuacan, or Tula. Previous studies of obsidian procurement hint at a dynamic landscape highly dependent on sociopolitical relations, where politics and their ascent/descent to and from influence pose major ramifications for obsidian exchange. However, La Magdalena, even at the crossroads of exchange between the Basin and the rest of north-central/western Mexico, maintained a reliance on one local obsidian source known as Ojo Zarco. Evidence of obsidian source use, superimposed on architectural changes and other material evidence, suggest a more discernible independence from influential obsidian networks in the Basin of Mexico than previously thought.

**Burke, Adam (Texas A&M University)**

[77]

*The More the Merrier: Using a Suite of Analytical Techniques to Arrive at Reliable Chert Ascription*

Determining the provenance of Florida cherts has been a major goal of archaeological researchers in the state for decades, and inquiry has largely focused on refining the existing petrographic and microscopic methods. When these methods of provenance were first developed, geochemical approaches using X-ray fluorescence spectrometry (XRF) were tested and determined to have little application for reliable chert characterization. While this early research demonstrated that XRF was not an appropriate method for characterizing Florida cherts, other research has shown that instrument neutron activation analysis (INAA) and laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS) have shown potential for chert characterization in the greater southeastern United States. This presentation will review recent successes in geochemical analyses of Florida cherts while also discussing why XRF failed where INAA and LA-ICP-MS have shown promise. A detailed understanding of regional geology and geomorphology is critical to a successful provenance study. Additionally, local taphonomic processes can introduce an added set of geochemical variables that must be accounted for. By addressing chert provenance studies from the ground up, researchers can move toward more reliable ascription. A systematic and multimethod approach to geochemical characterization within a regional geological framework is recommended for future provenance studies in Florida.

[77]

Chair

**Burke, Adrian (Université de Montréal)**

[77]

*Geology First, and Geochemistry Last (but Not Least)*

In this paper I present my perspective, based on 25 years of fieldwork, on the importance of geologically based approaches to sourcing lithic raw materials. Examples are presented from geoarchaeological fieldwork in Maine, New York, Vermont, New Brunswick, and Quebec. Observing and sampling an outcrop in situ is the only way an archaeologist can get an accurate picture of the variability in mineralogy, knapping quality/constraints, and size of blocks available to ancient knappers. This in turn informs the technological analysis of stone tools; there is no better place to understand the initial steps of the *chaîne opératoire* than at a quarry. Extensive sampling along and across strike will give the analyst the best chance of capturing the intrasource variability of the toolstone, whether that is knapping quality, mineralogy, or geochemistry. In the Appalachian region of eastern North America, successive orogenies have made it difficult to follow geologic formations and to sample these in a coherent manner. The complexity of the geology and the varying levels of metamorphism create additional challenges for the geoarchaeologist. I explain how these challenges can be overcome via detailed study of geologic publications, extensive geologic fieldwork, and collaboration with geologists in the field and lab.

Burke, Chrissina [26] see Benning, Maxwell  
 Burke, Chrissina [26] see Gilmore, Eric  
 Burke, Chrissina [13] see Gruntorad, Kelsey  
 Burke, Chrissina [26] see Laurich, Megan

**Burks, Jarrod (Ohio Valley Archaeology Inc.) and Albert Pecora (Ohio Valley Archaeology Inc.)**

[38]

*The Last Great Escape: Recovery of 1st Lt. Ewart Sconiers, an American World War II Bombardier Imprisoned at the Stalag Luft III POW Camp*

Like many recoveries, locating 1st Lt. Ewart Sconiers required research, persistence, and good old-fashioned luck. While imprisoned at the Stalag Luft III POW camp in German-occupied Poland, complications from an injury sent Sconiers to a hospital in a neighboring town—where he died. His burial occurred in a nearby municipal cemetery. During the Russian occupation of Poland, aboveground cemetery features were “erased” and memories of the American POW’s grave faded. In 2012, Ohio Valley Archaeology Inc. (OVAI) volunteered its time and equipment to conduct a geophysical survey in the cemetery, now a park in Lubin, Poland. Results of the survey work, along with World War II-era aerial photography and graveside imagery, identified two areas of

interest excavated by OVAL in 2015 under contract with DPAA. Trench 1 at the edge of the cemetery uncovered the graves of infants. Trench 2 revealed 14 burials within or scattered between seven graves. Bone distribution patterns and evidence of an intrusive trench excavation suggested an upper set of graves had been removed. Concurrent with our excavations, Sconiers' headstone was discovered in a recently posted online photograph from a French military cemetery in Gdansk, Poland. A positive identification was then confirmed by DPAA's DNA tests.

**Burnell, Taylor (University of San Diego) and Mark Sutton (University of San Diego)**

[133]

*New Methods for the Identification of Prehistoric Resins in the Southwest and Great Basin, USA: Proof of Concept*

The use of various organic resins as mastics and sealants in prehistoric North America is well documented in the archaeological and ethnographic literature. While the utilization of the creosote lac resin by people in western North America is known, resinous materials discovered in archaeological contexts are most often attributed to genus *Pinus* without formal analysis, partly due to the difficulty and cost of standard methods of identification. Here, three new techniques for the identification of resinous materials are described that are simpler and more cost effective than previous methods, and which will hopefully lead to the further study and better understanding of this aspect of ancient technology.

**Burns, Gregory (University of Utah)**

[175]

*Monetized Trade and Correlated Risk in Central California*

Isotopic evidence suggests use of shell bead money in central California developed during a time of high environmental uncertainty and decreasing social trust. Monetized exchange likely played a role in risk mitigation while maintaining independence of small groups. As a utility maximizing form of sharing, the role of trade in mitigating risk from variance that is uncorrelated in time and space is evident. This study explores the relationship between trade network function and parameters of correlation in resource variability. Observations of ethnographic exchange in California are consistent with the requirements of trade for overcoming correlated variability.

**Burns, Samuel (Department of Anthropology, Oregon State University)**

[95]

*A Late Pleistocene Snapshot: Feature 134 at Cooper's Ferry (Nipéhe), Idaho*

Cooper's Ferry (Nipéhe), located in the Lower Salmon River Canyon in western Idaho, is currently the oldest published radiocarbon-dated archaeological site in North America, with dates as early as ~16,000 cal BP. As this site is south of the southernmost extent of the continental ice sheets during the Last Glacial Maximum and given that the earliest dates at the site predate the opening of the Ice-Free Corridor, Cooper's Ferry provides critical evidence for studying the timing, route, and nature of the initial human migration into the Americas. The most recent seasons of excavation at Cooper's Ferry (2009–2018) uncovered several archaeological features in the earliest levels of the site, including a cylindrical pit feature (F134). This pit contained 131 debitage fragments, 15 FCR fragments, and 8 stone tool fragments, as well as bone and charcoal. The pit also included six human-transported basalt boulders that show evidence of percussive impacts. The current project is a description, analysis, and interpretation of the stratigraphy, artifacts, and context of pit feature F134, which provides a rare snapshot into Late Pleistocene human life in the Lower Salmon River Canyon.

Burns, Samuel [144] see Stone, Samantha

**Burt, Amanda (Indiana University)**

[129]

*Taboo to Chew: Cultural Influences on Dog-Feeding*

Dog-feeding strategies employed by Indigenous North Americans vary across place and time. Human restrictions on prey animal parts given to dogs have been recorded in the ethnohistoric record. Dog feeding taboos are transcultural and often speak to ideas of a dog's place among other animals and the influence dogs may have on the predator-prey relationship in hunting events. Restrictions humans placed on food sharing with their dogs range from mild apprehension to elaborate rituals, with the goal of keeping balance in the natural world, especially between the domestic and wild, the owned and unowned. This paper uses multiple lines of evidence including archaeological faunal remains, dental microwear, animal iconography, and ethnohistoric records to investigate food sharing and feeding restrictions between humans and their dogs. Investigating taboos associated with dog feeding provides a more contextualized understanding of dog-keeping in the past. Research presented will illuminate intentional human provisioning strategies of a companion species and contribute to anthropological knowledge of the dynamic ways the natural world has been conceptualized in the past.

**Bush, Dominic (East Carolina University), Jennifer McKinnon (East Carolina University) and Erin Field (East Carolina University)**

[85]

*Microbiologically Influenced Corrosion of World War II Aircraft Wrecks in the Pacific*

Aircraft were a major component of the US war effort in World War II, and today numerous examples can be found throughout the waters of the Asia-Pacific region. Due to their cultural and historical significance to modern stakeholders, understanding the decay trajectories has become an important issue in the realm of cultural heritage management, especially in light of efforts to establish sustainable coastal zones. While the majority of corrosion studies have focused on electrochemical exchanges at the seawater-metal interface, far less attention has been paid to the effects of colonizing microorganisms that can contribute to increased rates of



corrosion through processes of microbiologically influenced corrosion (MIC). To rectify this, several World War II aircraft wrecks in the Pacific were chosen as case studies. The objective is to collect samples of biofilm, which contain complex microbial communities, directly from these sites for the purposes of DNA sequencing. The results would be the first time that researchers have conclusively determined the makeup of the microbial communities found on the surface of a submerged aircraft wreck. Armed with this data, taxa-specific mitigation efforts can finally be considered. Furthermore, the results of this study would serve as a baseline and blueprint for future research.

**Butler, Don (University of Alaska, Fairbanks), Zachary Dunseth (Brown University), Yotam Tepper (University of Haifa), Guy Bar-Oz (University of Haifa) and Ruth Shahack-Gross (University of Haifa)**

**[191]**

*Agropastoral Resource Management in the Negev Heartland toward the Close of Late Antiquity*

We report new geoarchaeological evidence for a community-scale response to changing agropastoral economics in the Negev Desert during Late Antiquity (ca. fourth–tenth century CE). Sustainable resource management is of central importance among agrarian societies in marginal drylands. In the Negev, the importance of hinterland trash deposits as archives of resource use/disposal strategies has been overlooked until recently. Without these data, assessments of localized variability in responses to societal, economic, and environmental reconfiguration are incomplete. We studied trends in the disposal of cultivar wastes, herbivore dung, fuels, and construction debris at the Byzantine-Umayyad communities of Shivta, Elusa, and Nessana using a suite of micro-geoarchaeological techniques. Our investigations detected a turning point in the management of herbivore livestock dung, a vital resource in the Negev. The scarcity of raw herbivore dung in the studied deposits suggested the use of this resource as sustainable fuel and agricultural fertilizer. In contrast, stratigraphic layering indicative of in situ fire paired with an abundance of dung ash indicated the dumping and incineration of raw dung outside the village of Nessana. We discuss how this reflects the decline of market-oriented agriculture and the ruralization of the Negev urban heartland toward the close of Late Antiquity.

**Byrd, Julie (PaleoWest)**

**[187]**

*Educating Politicians: Outreach and Advocacy Behind the Front Lines*

PaleoWest demonstrates leadership in outreach through political advocacy at local, state, and federal levels of lawmaking. Taking action on multiple levels and working behind the scenes, we shape public policy to meet industry needs. This paper will discuss examples of our efforts and provide a blueprint for other CRM professionals to make similar contributions. Successes at the local ordinance level in Florida have been realized through engagement with commissioners and the mayor. PaleoWest lobbied Congress to provide adequate funding to the nation's largest federally funded archaeological project, resulting in the New Mexico Navajo Water Settlement Technical Corrections Act. Nationwide advocacy aims to improve legislation and procedures impacting archaeological consulting. In contrast to outreach "on the front lines," which often aims to reach interested members of the public, retirees, and the next generation, political advocacy represents outreach focused on decision makers who shape public policy. Policy-oriented outreach occurs through strategic placement of ideas via formal and informal work with politicians, ground-level movers and shakers, and other professionals in archaeology. Through concerted efforts, such as the examples provided in this paper, measurable strides have been made to mold local codes, state laws, and nationwide regulation in favor of our profession's goals.

Cabanes, Dan [174] see Sanz Borràs, Montserrat

Cadena, Pete [10] see Snitker, Grant

**Calabrese, Agata (University of Sydney)**

**[176]**

*Lamenting the Dead: The Acoustic Element in Bronze Age Funerary Rituals in Syro-Mesopotamia*

This paper will employ GIS in exploring the experiential aspects of the burial process in Early Bronze Age North Mesopotamia, with a particular attention to funerary soundscapes. To investigate the potential impact of vocal and musical sound, a 10 m resolution digital elevation model (DEM) was developed, and the "System for the Prediction of Acoustic Detectability" (SPreAD-GIS) was employed to predict the potential acoustic "footprint" on a series of Early Bronze Age (third millennium BCE) archaeological sites. The results of this study suggest that music and vocalization (i.e., lamentation singing) had strong impacts, both within the immediate mortuary landscape and beyond. This has important mnemonic consequences for the society of the first urban centers. The funerary arena in Early Bronze Age Syro-Mesopotamian society involved many different sensory experiences, among the most important visibility, movement/processions, and sound. The archaeological sites of Ebla, Mari, and Ugarit preserve the archaeological/cuneiform evidence for a rich music culture associated with funerary rituals, but how this impacted the society remains unclear. A better understanding of the acoustic landscape will form a vital component in assessing the societal impact of public and private funerary rituals in the first urban centers.

Caldarelli, Solange [66] see Kipnis, Renato

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

**[136]**

*The Maya Economy: Dual? Integrated? Embedded? Or All of the Above?*

In this paper we argue that the complexity of Maya economic structures and the debates that ensue over their interpretation stem from the fact that manifestations of those economic structures vary so greatly across time and space in the precolumbian Maya world. Maya economies were both dichotomized along elite and commoner lines, while also integrated in some times and places. For this reason, a priori assumptions and traditional economic models must be used with caution to characterize the entirety of the Maya economy. The embedded nature of Maya economies further complicates interpretation as many traditional economic models do not take into consideration the implications of the interconnectedness of social, political, and economic structures and primarily focus on evidence of wealth accrual and power consolidation among the elite.

Callaghan, Michael [171] see Crawford, Dawn

Callaghan, Michael [67] see Palacios, Horvey

Callaghan, Michael [2] see Whyte, Rachel

**Calongos Curotto, Manuel (University of Pittsburgh)**

[118]

*The Inca Administration of the Middle Cañete Valley, Peru*

The historical accounts of the Cañete Valley, recovered by the Spanish conquistadores, inform that the Incas found two different kinds of reactions to their conquest attempts: while the Guarco kingdom, in the lower valley, resisted the Incas domination; the Lunahuná kingdom, in the middle valley, supported the Inca troops and generals. While this information recovered by the Spanish records has been fundamental in the archaeological interpretation, it has obscured the different strategies and mechanisms used by the Incas to administer the valley. Recent studies in the Incahuasi regional administrative center, in the middle valley, have shown important elements of Inca taxation. However, this is not enough to fully understand how the *cuzqueño* invaders managed to organize and administer this region nor to identify how the local population reacted to the imperial agenda of the Incas. The data collected in a survey of the middle Cañete Valley have revealed interesting patterns regarding the territorial organization during the Inca occupation of the area. After performing a GIS analysis, two different layers of organization have been identified coexisting with each other. This provides some insights regarding the Inca strategies of administration and governance of the middle Cañete Valley.

**Cameron, Asa (Yale University), Bukhchuluun Dashzeveg (Yale University) and Jonathan Mark Kenoyer (University of Wisconsin-Madison)**

[93]

*Making the Exotic from the Familiar: The Source and Production of Carnelian Beads during the Late Bronze Age and Early Iron Age in Mongolia*

During the Late Bronze Age and Early Iron Age in Mongolia, communities across the region adopted mobile pastoralism and horse-riding technology. In conjunction with these changes in subsistence and mobility patterns, innovative funerary practices emerged that incorporated monumental construction and new mortuary offerings. Included in these grave goods were forms of body adornment that utilized carnelian beads. Since the first discoveries of these semiprecious stone beads, archaeologists have speculated about the origin of the carnelian and assumed that these artifacts were exotic trade goods linking Mongolia to regions as far as the Indus Valley in Southeast Asia. This project presents the results of LA-ICP-MS (laser ablation–inductively coupled plasma–mass spectrometry) and SEM (scanning electron microscopy) analysis of carnelian beads from the Late Bronze Age and Early Iron Age. These analyses provide the first data on the source of carnelian beads and their related production technology. The results inform our understanding of craft production and exchange patterns during this period in Mongolian archaeology.

Cameron, Asa [93] see Dashzeveg, Bukhchuluun

**Cameron, Catherine (University of Colorado)**

[79]

*Discussant*

**Cameron, Catherine (University of Colorado)**

[127]

*Hidden People in the Past: Honoring the Scholarship of Debra Martin*

Because archaeologists use ancient material culture to reconstruct the lives of people in the past, they tend to find those people with the most abundant and well-preserved property. Only the past few generations of archaeologists have looked beyond large settlements and monumental buildings to investigate common people. But just like today's societies, those in the past were made up of the rich and poor, prominent and insignificant, and the truly marginal. Fifteen years ago I began to study one of the most marginal of ancient people: captives taken in raiding and warfare. Using ethnographic and ethnohistoric records I discovered a class of people largely unstudied by archaeologists. But how to find these people in the past? I realized that Dr. Debra Martin had, using bioarchaeological methods, developed robust analytic tools to “see” captives and other marginalized groups in the archaeological record. This paper explores recent developments in the study of captives and focuses especially on how the scholarship of Debra Martin and her students has formed a critical grounding to this work.

**Camp, Stacey (Michigan State University), Dante Angelo (Universidad de Tarapacá, Arica, Chile), Kelly Britt (Brooklyn College, The City University of New York) and Margaret Brown (Duke University)**

[86]

*Healing Trauma through Heritage Making: Perspectives from COVID-19*

Through a contemporary archaeology of the COVID-19 pandemic, we attempt to dissect practices of commemoration, remembrance, and memory, which are linked to the process of heritage making through anthropological archaeology

methodologies. The global pandemic poses some opportunities and challenges to archaeologists. On the one hand, it provides us a setting in which connections and responses to a global phenomenon unfold before our eyes, unveiling the minutiae of behavioral responses to it that could not be assessed otherwise. On the other, it prompts us to reflect on how our contemporary material past is understood and approached. What happens when heritage is not an exploitable/profitable resource? Is it even heritage? What about all the material culture that is being produced, most of which is ephemeral and won't last enough to be thought of as heritage. Will it produce places of commemoration or places of memory/heritage? We address these questions based on our ongoing documentation of and experience with different material expressions of the pandemic in cities of the USA and Chile. In an attempt to provide a nuanced understanding of heritage that could defy the legal and economic aspects of the heritage machine, we explore the healing and deliberating aspects of it.

**Campbell, Rod (Institute for the Study of the Ancient World, NYU)**

**[45]**

*Discussant*

Campbell, Stuart [29] see Pal Chowdhury, Manasij

**Campetti, Casey (FHWA)**

**[134]**

*Discussant*

**Campetti, Casey (FHWA)**

**[160]**

*Discussant*

**Campiani, Arianna (Marie Curie Fellow, UNAM & UNIROMA 1)**

**[181]**

*Urban Form and Social Dimension at the Classic Maya City of Palenque*

In this paper I will explore the extent of planning and its social dimension at the ancient Maya city of Palenque, Chiapas, Mexico. Between the seventh and ninth centuries, during the Classic period, the plateau where Palenque is located was extensively modified resulting in a prosperous, highly nucleated city, harmoniously integrated with its surrounding. Through the analysis of spatial organization, accessibility, infrastructure, and water management features, among others, I will assess the environment modifications that guaranteed control and access to resources at city and neighborhood level. Likewise, I will delve into the effect of urban driving forces—like land-type, distance from the city core, from water resources or infrastructure—into the urbanization processes. The impact of planning choices within the city and the differences between neighborhoods will be contrasted with GIS studies. Such an approach can help elucidate the way city guides and sustain the flow of practices and experiences and how its material structure channels movements while fostering and conditioning human interactions. Similarly, this methodology can help thinking on the way social divisions, expressed in the materiality of urban form, would have conditioned or differentiated the experience of the city.

**[181]**

*Chair*

Campo, Allison [29] see Esh, Kelley

Campos, Cinthia [10] see Hertfelder, Paula

**Cancho Ruiz, Christian (University of Virginia) and Alicia Gorman**

**[128]**

*Nuevas evidencias desde Cerro Tortolita un sitio del Intermedio Temprano en la costa sur del Perú-Ica*

Nuestra investigación busca entender la relación entre la religión y la política en contextos domésticos durante la época Nasca. Es así que Cerro Tortolita (valle de alto de Ica), dada su naturaleza y escala constructiva; el cual incluye un componente ceremonial y otro residencial; constituye un sitio de singular importancia para el evaluar cómo operan ciertos mecanismos religiosos y de autoridad en una sección del valle poco explorada. Investigaciones previas en la "Zona Ceremonial" han permitido identificar ciertos elementos análogos al centro ceremonial Cahuachi, incluyendo el acceso a su cerámica distintiva (Vaughn 2017). Nuestro proyecto por su parte fue diseñado para complementar la información y establecer correlaciones entre ambas áreas. Es así que, se excavó las viviendas ubicadas en la denominada "Zona Residencial Primaria" (al sur de la Zona Ceremonial), un área que contiene aglutinadas más de 100 estructuras de piedra de forma semiovalada; teniendo por objetivo evaluar el grado y la naturaleza de diferenciación social en el sitio, específicamente los "enredos" entre autoridad religiosa y potenciales desigualdades económicas y políticas.

Cancho Ruiz, Christian [128] see Gorman, Alicia

**Cank, Kristof, Joshua Henkin, Anita Cook and Nicholas Oberlies****[133]***A Nondestructive Natural Residue Analysis of Wari Ceramics using the Droplet Probe*

Analyzing ceramics from ancient cultures, many of which are degraded or damaged from hundreds or thousands of years of weathering, present some unique challenges. Mass spectrometry coupled with separation techniques such as liquid chromatography provides a means to analyze residues on artifacts. However, most well-known analytical techniques usually cause at least some amount of destruction of the material during the preparation phase. This can lead to the loss of valuable spatial information about an artifact and can cause inability for further analysis. We present a test case of using a nondestructive LC-MS technique, termed the droplet-liquid microjunction-surface sampling probe (i.e., droplet probe), for studying the chemistry of ancient Peruvian sherds. This method combines the benefits of mass spectrometry with the collection of chromatographic data, which affords more complex residue analysis. Three naturally occurring plant secondary metabolites—aurantiamide acetate, aurantiamide benzoate, and aurantiamide—were identified on the surface of a vessel and a spoon sherd from the central highlands of Peru. The detected natural compounds can shed light on what range of raw or prepared foods and liquids were used with the ancient Andean vessels/utensils.

Cank, Kristof [133] see Bisulca, Christina

**Cannarozzi, Nicole (University of Florida)****[146]***The Zooarchaeology of the Christiansted National Historic Site St. Croix, USVI*

The Christiansted National Historic Site, located in the town of Christiansted on St Croix, US Virgin Islands, was a Danish military compound that served as a major trading hub dealing in the trade of enslaved Africans. As such, the compound was home to both Danish soldiers and the enslaved Africans on whom they depended for survival. This research presents preliminary data from the analysis of faunal remains excavated from areas within the compound representing various contexts. Preliminarily, this study indicates a heavy reliance on young, domesticated animals in which representation of all skeletal portions of each of the domestic animals may suggest some livestock were likely kept within the compound. Marine resources such as fishes and shellfish are present in fewer frequencies than expected given the proximity to the coast and compared to other Danish colonial islands. Other nonlocal faunas including hutia, domestic rabbit, cat, cod, and preliminarily identified fallow deer are rare, but may be indicative of instances of meat provisioning, acquisition of supplemental protein sources by the enslaved community, and translocation of fauna from other islands.

Cantin, Marie-Pier [81] see Hodgetts, Lisa

**Cantoral Herrera, Jesus (SEDENA) and Ruben Manzanilla Lopez (DSA-INAH)****[63]***Avances del proyecto de salvamento arqueológico en el nuevo Aeropuerto Internacional Felipe Ángeles*

La Base Aérea militar de Santa Lucía, en el noroeste de la cuenca de México, tendrá dentro de sus límites al nuevo aeropuerto internacional de la ciudad de México, "General Felipe Ángeles", en sus más de 4,000 hectáreas, se han encontrado evidencias arqueológicas que nos hablan de diversas aldeas de agricultores pescadores del periodo Epiclásico y barrios del Posclásico tardío relacionados con la sede del señorío otomí de Xaltocan, sin embargo, lo más destacado del salvamento arqueológico han sido los hallazgos paleontológicos que han arrojado una colección ósea de megafauna del pleistoceno tardío que apunta a ser la más importante de Latinoamérica. En la presente exposición damos a conocer los avances de la investigación.

**Cantu, Katrina (UC San Diego Scripps Institution of Oceanography) and Isabel Rivera-Collazo (UC San Diego Scripps Institution of Oceanography)****[68]***Coastal Change and Human Dynamics: Preliminary Results of Sediment Core Analysis*

Coastal change can have major impacts on human livelihood security, in the past as well as the present. Sediment cores from coastal wetlands can be used as archives to reconstruct ancient landscapes and coastal environments as well as to understand the impact of ancient sea level inundation and intense atmospheric events. This study presents the preliminary analyses of two 2 m sediment cores, collected from a Black Mangrove swamp on the grounds of the Hacienda La Esperanza Nature Reserve in Manatí, in the central northern coast of Puerto Rico. The sediments have several visible stratigraphic changes, likely due to relative sea level rise and coastal flooding events. The top of the core shows evidence of a coastal flooding event, which we attribute to the 2017 Hurricane Maria, a Category 5 hurricane that caused major damage and significant loss of life in Puerto Rico. A record of elemental abundances determined by X-ray fluorescence also supports the interpretation of acute marine incursions punctuating longer term relative sea level rise. Ongoing and future analyses will include radiocarbon and optically stimulated luminescence (OSL) dating, grain size distributions, paleobotany, and micropaleontology to better reconstruct the geomorphological and flooding history of the study area.

**Canuto, Marcello (M.A.R.I./Tulane University) and Luke Auld-Thomas (Tulane University)****[104]***Lidar as a Tool to Estimate Late Classic Population in the Central Maya Lowlands*

In 2016, the Pacunam Lidar Initiative surveyed 2,100 km<sup>2</sup> of the Maya Biosphere Reserve in the Department of Petén, Guatemala. This lidar survey provided an unprecedented scale of settlement data that attest to elevated population levels throughout the southern Maya lowlands, especially for the Late Classic period. Current estimates suggest a population of between 7 and 11 million

people for the region during this period. In this paper, we discuss how demographic estimates derived from archaeological data come with a relatively high degree of uncertainty and argue that when dealing with large areas, population estimates should always be expressed using ranges to avoid false precision. We review various methodologies used to develop population estimates along with the potential problems inherent with each, and propose means of constraining these problems to produce reliable estimates. We conclude by discussing how ongoing fieldwork in these lidar survey regions is providing data that further refine our estimates, rendering them more robust.

Canuto, Marcello [76] see Barrientos, Tomas

Canuto, Marcello [181] see Horowitz, Rachel

**Cap, Bernadette (San Antonio Museum of Art)**

**[56]**

*Discussant*

**Cap, Bernadette (San Antonio Museum of Art) and Rachel Horowitz (Washington State University)**

**[136]**

*Embedded Ancient Maya Economies*

Ancient economies are intertwined with aspects of the daily life of individuals in both market and premarket economies. To more fully understand these relationships, we must explore the ways in which economic actions are embedded and entangled within social, political, and religious practices. We briefly discuss the history of the term and how we utilize it despite a history of much debate within the sphere of economic anthropology. Discussion on the organization of ancient Maya economies has been a subject of much debate in part due to this history. With more recent finds of market exchange and more complex studies of economies it is a good time to reassess the ways in which economies are embedded throughout Maya society. We provide an example of this through a brief discussion of the exchange of bifaces among the Classic period Maya in western Belize.

**[136]**

*Chair*

**Caplan, Allison (University of California, Santa Barbara)**

**[180]**

*Assembling Bodies: Multimediality in Nahua Precious Costumery*

The working of precious materials—greenstones, shells, turquoise, gold, and feathers—represented an arena of artistic specialization and tailored, technological expertise among the Late Postclassic Nahuas. Such specialized productions were almost exclusively destined to serve as components of multimedia costumes, which adorned and made tangible the bodies of rulers, nobles, god-impersonators, and gods. This presentation will examine the practices of assemblage implicit in multimedia costumes, asking how the layering and juxtaposition of different precious devices and materials can be understood as itself a Nahua artistic practice, guided by key aesthetic tenets related to movement, brilliance, and sound. This analysis brings to the fore Nahua approaches to assemblage as an artistic strategy and asks how such display-oriented practices intersect with and generate new understandings of the materials and skills entailed in earlier stages of production.

Capriles, José [47] see Delaere, Christophe

Carabias, Diego [98] see Cartajena, Isabel

Carbajal Salazar, Barbara [16] see Corcoran-Tadd, Noa

**Carballo, David (Boston University), Daniela Hernández Sariñana (Boston University), Maria Codlin (Boston University), Alfredo Saucedo Zavala (INAH) and Gloria Torres Rodriguez**

**[101]**

*Recent Research at the Neighborhood Center of Tlajinga, Teotihuacan*

Investigations of the Proyecto Arqueológico Tlajinga Teotihuacan (PATT) in 2019 focused on the southern neighborhood center of this cluster of non-elite residences in the southern periphery of the ancient Mexican metropolis. Research objectives included understanding the social infrastructure of public space within the district and how it tied its inhabitants together. Methods included excavations at two large architectural complexes, geophysical prospection of the same as well as adjacent structures and plazas, and floor and sediment chemistry analysis. They revealed architecturally elaborate complexes decorated with mural painting that appear to have been the loci of civic-ceremonial activities. Materials from the excavated portions of the complexes are inconsistent with residential uses, though it is possible that local elites lived elsewhere in the complexes or in nearby ones. The investigations therefore demonstrate that the semipublic spaces of neighborhood centers on the periphery of Teotihuacan could be as elaborate as those in the urban epicenter, underscoring the city's more muted social inequality.

Carballo Marina, Flavia [6] see Belardi, Juan

Carleton, Chris [98] see Rondeau, Rob

Carlson, Kristen [96] see Gover, Carlton

**Carlson, Meredith (University of California, Davis), Christopher Beckham (University of California, Davis), Caleb Chen (University of California, Davis) and Peiqi Zhang (University of California, Davis)**

**[31]**

*Modeling Time Investment Trade-Offs for Stone and Wooden Mortars*

California archaeology and ethnography record instances of mortars made from wood, as well as stone. Differences in raw material availability, intended uses, and mobility are major factors that could contribute to preferential manufacture of wooden mortars versus similarly shaped stone mortars. Although previous research finds that wooden mortars take fewer hours to produce than comparably sized stone mortars, the relative costs and benefits of mortars made from these materials remains understudied. Here, we formalize the investment trade-offs between stone and wooden milling tools, using experimentally obtained return rates for processing acorns (*Quercus kelloggii*) and Indian ricegrass seeds (*Oryzopsis hymenoides*). This research attempts to address the subsistence and mobility patterns under which wooden mortars would be preferred to stone ones.

Carlson, Meredith [31] see Chen, Caleb

Carlson, Meredith [31] see Zhang, Peiqi

**Carmichael, David**

**[65]**

*Sites, Non-sites, and Landscapes: Changing Land-Use Patterns in Wild Horse Draw and Vicinity, Trans-Pecos Texas*

The University of Texas at El Paso 2014 summer archaeological field school was hosted by the Ysleta del Sur Pueblo at Chilicote Ranch near Valentine, Texas. Students conducted a pedestrian sample survey focused on the cuevas and mesas between the Sierra Vieja and Wild Horse Draw. The survey identified 95 sites and a number of non-sites; distributional patterns revealed several kinds of small-scale topographic features that influenced aboriginal use of the drainage. In some cases, landforms were altered by the addition of subtle rock features, and it is apparent the use of such features, and the terrain on which they occur, varied over time. Micro-terrain details also influence site exposure, erosion, and artifact and feature visibility. Comparisons to the Indio Mountains to the west suggest that Chilicote Ranch may be at or near the western boundary of rock-based wickiup features commonly attributed to the Cielo Complex, but that Mescalero Apache-style agave roasting features do not conform to that boundary.

Carmody, Stephen [32] see Fields, Mara

Carpenter, Elsa [7] see Davis, Mary

**Carpenter, Lacey (Hamilton College)**

**[135]**

*Daily Life Past and Present: The Role of Relationships and Strategies in Structural Change*

The long history of research in Oaxaca, Mexico, has influenced archaeological method and theory far beyond the region. Specifically, the archaeology of Oaxaca has contributed significantly to the study of households, daily life, and transformative social change. My work at the Tilcajete sites takes a household-centered approach wherein the household is more than just a building block or productive unit, but a socially constituted assemblage. Through this work, I investigate the roles of household members, their relationships, and the strategies of daily life on transformative social, political, and economic changes that took place between 500 BC and AD 100. This research is conducted with the contemporary community of San Martín Tilcajete. Our focus on the role of relationships and strategies of daily life in the context of structural change has influenced the nature of our collaboration. We jointly sought funding for a project involving both of our communities. We conducted the first portion of our project in San Martín Tilcajete, an artifact illustration program involving women artisans from the community, and the second, an interactive exhibition, in Ann Arbor. We worked together to challenge the structures that often prevent this kind of exchange and the reciprocal crossing of borders.

Carpenter, Lacey [13] see Dorr, Lana

Carpenter, Lacey [4] see Ivins, Erica

**Carpio, Edgar**

**[155]**

*Flint Artifacts in Salinas de los Nueve Cerros: An Approach to Production and Consumption*

This paper presents the preliminary data from a study that has been carried out on a considerable collection of flint artifacts from Salinas de los Nueve Cerros, Guatemala. These were uncovered during the excavations of the site over eight field seasons. Flint is a local resource in Salinas and it was widely used to produce many objects mainly used as cutting tools.

Carr, Christopher [171] see Frashuer, Anya

**Carr, Philip (University of South Alabama)****[58]***An Organization of Technology Model and Archaeological Inference*

In the late twentieth century, the investigation of settlement patterns and mobility were considered important archaeological endeavors. Analyzing stone tools assemblages to make inferences of group mobility was based on utilizing simple dichotomies. For stone tools, the concepts of curated and expedient dominated thinking. Likewise, the constructs of foragers and collectors controlled inferences regarding mobility. While a more nuanced understanding of these concepts and constructs has developed, there remains today an interest in inferring mobility patterns from lithic assemblages and the significance of these dichotomies should not be underestimated. An organization of technology model has been proposed as a means of making inferences of past behavior, including mobility, based on archaeological data in terms of artifact form and distribution, namely lithic data. This model is explored here with consideration of how it constrains inferences and how data cause reconsideration of the model. Conclusions are drawn regarding whether the model should be abandoned or it retains sufficient utility for continued application and revision.

Carr, Philip [77] see Sherman, Simon

Carrancho, Ángel [174] see Sanz Borràs, Montserrat

Carrasco, Carlos [47] see López Mendoza, Patricio

Carrasco, Michael [107] see Englehardt, Joshua

**Carreón Blaine, Emilie (Instituto de Investigaciones Estéticas, UNAM)****[154]***Mesoamerican Ballgame, Human Sacrifice, Ritual Decapitation, and Trophy Taking: Variations in Ways of Displaying*

The purpose of this collaboration is to present the results of the analysis of a human skull located at the center of the ball court of Santa Rosa, Chiapas, and to review the implications it presents for the study of the Mesoamerican ballgame and its relationship to human sacrifice. It is a unique case in which hard archaeological data directly associates a skull with the ballgame. It will allow for the review of the widespread proposal linking the ball court with the *tzompantli*. It will serve as a basis to present the many manners in which human body parts, primarily the head, were displayed and to explore how Mesoamerican peoples appropriated and adapted what were culture area-wide paradigms in thought and behavior.

Carroll, Stephanie [49] see Anderson, Jane

**Carson, Mike (Micronesian Area Research Center (MARC))****[172]***Discussant*

Cartagena, Nicaela [119] see Powis, Terry

**Cartajena, Isabel (Universidad de Chile), Diego Carabias (Centre for Maritime Archaeology Research of the Southeastern Pacific), Renato Simonetti (Centre for Maritime Archaeology Research of the Southeastern Pacific), Valentina Flores-Aqueveque (Centre for Maritime Archaeology Research of the Southeastern Pacific) and Cristina Ortega (Universidad de Chile)****[98]***New Insights into a Late Pleistocene Submerged Landscape on the Pacific Coast of South America*

Identifying evidence of human activity on the continental shelf might prove challenging and employing inductive explanation by collecting data on available evidence represents an initial step to build generalizations. This is the case of the Late Pleistocene site GNL Quintero 1 (GNLQ1), located in Quintero Bay (32° S), central Chile, which provides the first evidence of a drowned terrestrial site along the Pacific continental shelf of South America covered by sea level rise after the LGM. A substantial continental extinct fauna assemblage has been comprehensively excavated and dated 29–23.1 cal kyr BP. However, recent paleoenvironmental and marine geophysical data enables reinterpretation and sheds considerable light on site history. New radiocarbon dates of bones and sediments provide ages between 23 and 21.5 cal kyr BP, suggesting a more recent stratigraphic sequence than previously known. Georeferenced historic charts indicate large lagoons with a rich ecosystem existed before modern impacts to the landscape while coastal aeolian deposits suggest dunes covered an extensive area coinciding with the formation of GNLQ1. These new data support the fact that floodplains with a shallow wetland developed among dunes associated to a low energy fluvial environment represented a major coastal landscape feature.

Cartajena, Isabel [68] see de Souza, Patricio

**Carter, Alison (University of Oregon) and Sarah Klassen (University of British Columbia)****[150]***Diachronic Modeling of the Population within the Greater Angkor Settlement Complex*

Angkor is the world's largest premodern settlement complex, but to date no comprehensive demographic study has been completed, and key aspects of its population and demographic history remain unknown. Here, we combine multiple lines of evidence, including comprehensive lidar maps, archaeological excavation data, and machine learning algorithms, to model population growth through time and produce the first granular, diachronic, paleodemographic model of the Angkor complex. We conclude that the Greater Angkor region was home to approximately 650,000–700,000 inhabitants at its apogee in the thirteenth century CE. Our study resolves more than a century of debate on this question, and fills a critically important lacuna in our understanding of urbanism and population growth in premodern tropical environments.

Carter, Alison [150] see Bhattacharyya, Tiyas

Carter, Alison [29] see LeRoux, Marie

Carter, Alison [150] see Heng, Piphai

Carvalho, Milena [151] see Haws, Jonathan

**Carvey, Andrea (DrumFire, Visual Communications)****[10]***Augmented Reality and Virtual Reality Applications in Archaeology*

Augmented Reality and Virtual Reality are becoming essential aspects of archaeological investigation. We review past and current explorations, including the equipment and software available. Future applications for visualizing archaeological data will be investigated in keeping with the SAA Principles of Archaeological Ethics.

**Casana, Jesse (Dartmouth College) and Madeleine McLeester (Dartmouth College)****[131]***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, isotopic, and paleobotanical approaches. At the same time, contemporary theoretical discourses exploring the entanglements of humans with their environment—alongside the transdisciplinary debate surrounding the establishment and definition of the Anthropocene as a geologic epoch—bring critical urgency to archaeological identification of past agricultural land use practices. Herein, we argue for the importance of archaeological investigations that prioritize discovery and interpretation of relict fields and their constitution within larger human 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 [131] see Laugier, Elise Jakoby

Casana, Jesse [131] see McCoy, Mark

Casana, Jesse [131] see McLeester, Madeleine

Casanova González, Edgar [177] see Cruz Jimenez, Ricardo Leonel

Casar Aldrete, Isabel [154] see Ruiz, Judith

Casar Aldrete, Isabel [72] see Somerville, Andrew

Casalheira, João [124] see Bicho, Nuno

Casalheira, João [124] see Fonseca, Sofia

Casalheira, João [151] see Haws, Jonathan

Casalheira, João [21] see Horta, Pedro

**Caseldine, Christopher (Archaeology Southwest)****[143]***Political Water: Hohokam Irrigation and Sociopolitical Organization in Canal System 2, Lower Salt River Valley, Central Arizona*

Since the publishing of *Irrigation Communities: A Comparative Study* in 1955, sociopolitical hierarchy has factored strongly in interpretations of irrigation system control. A lively debate has developed as to where control lies, ranging from a central authority (top-down) to water user cooperatives (bottom-up). Although Hohokam irrigation has appeared in that debate, theoretical interpretation in the Phoenix Basin has not kept pace. Interpretations heavily influenced by chiefdoms literature led to a purported disconnect between the development of Hohokam irrigation and society. Hohokam irrigation was characterized as persisting through time, while several significant sociocultural transitions are noted, especially in the lower Salt River Valley portion of the Phoenix Basin. In this paper, I argue that previous hierarchical control models of Hohokam irrigation appear unsubstantiated. Using Canal System 2 as a point of entry, I reevaluate current models with decades of excavation data from the system and contemporary



irrigation theory. With attention given to agricultural surplus, the necessity of hierarchy in irrigation, and platform mounds as markers of irrigation control, a revised structure of Canal System 2 comes into focus. I find that the organization of irrigation and the associated community in Canal System 2 was multidimensional, rather than a nested hierarchy.

Casperson, Molly [6] see Lewis, Michael

Castañeda Espinoza, Blanca Iveth [63] see Espinosa, Samantha

### **Castillo Leal, Elihud**

**[63]**

*Xaltocan, resultados preliminares del salvamento en la interconexión aeroportuaria*

Se presentarán los resultados preliminares del análisis cerámico, lítico y osteológico de los materiales obtenidos durante las excavaciones en los sitios registrados en la interconexión de la construcción del nuevo Aeropuerto Felipe Angeles en el municipio de Nextlalpan en la localidad de Xaltocan, que es un asentamiento fundado en el periodo Postclásico Temprano. Éste trabajo deriva tanto de materiales obtenidos durante el recorrido de superficie como del proceso de excavación en los 5 polígonos registrados como áreas de actividad temporales y/o permanentes en la periferia de un asentamiento mayor.

Castro, Aguinaldo [66] see Kipnis, Renato

Castro, Andrey [66] see Kipnis, Renato

### **Castro-Priego, Manuel (Alcala University), Lauro Olmo-Enciso (Alcala University) and Marcos Octavio Labrada Ochoa (Cordoba University)**

**[149]**

*New Manteños Social Spaces: The Materiality of Ligüiqui (Manabí, Ecuador)*

The "Perduraciones" project, which has been taking place in the central area of the Ecuadorian coast since 2018, has focused part of their research on the characterization of the social space resulting from the process of articulating European colonization on the present coast of Ecuador during the sixteenth to eighteenth centuries. In the first phase of the project, research is trying to characterize the modification in the landscape and territory that involved the traumatic process of conquest. At the same time, the excavation of a site with phases of the final *manteño* period (Ligüiqui), pretends to be an element of contrast with the new reality imposed by the colony. In this work, we present a first approximation to the materiality of this site, their chronology, and its characteristics, among which especially the stone fishing corrals.

### **Cathcart, Danielle (RGA Inc.)**

**[183]**

*Warehousing the Past: Are We Doing the Right Thing?*

The cultural resource management (CRM) industry, emerging from the passage of landmark national and subsequent state-level legislation, is arguably one of the largest generators of archaeological collections in North America. Project-specific deadlines, budgetary constraints, variations in state agency guidelines, and the realities of property ownership present CRM companies with an ethical dilemma that has resulted in collections remaining in limbo, or worse, orphaned in warehouses across the country. Often a collection's owner is reluctant or unable to shoulder the costs of long-term curation, elevating the risk of total collection abandonment or loss. While the fate of federally owned collections is never in question, the bulk of many firms' collections originate from private, state, or municipal lands. The dearth of private, local, or state-run repositories able to accept new collections compels CRM firms and local historical societies to function as de facto repositories with little to no mandate or financial support to do so. Richard Grubb and Associates Inc. (RGA), in operation since 1988, is keenly aware of the chronic and immediate nature of these issues. This paper will share RGA's strategy, successes, and challenges in navigating these murky waters.

Catignani, Tanya [155] see Takatsuchi, Ryohei

Catignani, Tanya [100] see Taxis Muñoz, Ariel

### **Catlin, Kathryn (Brown University)**

**[123]**

*Political Ecology Materialized in a Medieval Icelandic Landscape*

Past ecological and political-economic changes are embedded in the materiality of the landscape, and investigating correlations between such changes can suggest how relationships between ecology and economy were structured and managed within past societies. Iceland was first settled in the late ninth century by wealthy Norwegian farmers and their households, whose early efforts rapidly transformed the island from forested wilderness to pastoral landscape. The environmental impact of this settlement is materially evident as deforestation and erosion. A regional archaeological survey of medieval settlements shows that as environmental degradation reached a turning point, people were leaving the very smallest settlements, likely moving to join larger farming households. The abandonment of small settlements illustrates a shift in the way social inequality was organized: early social differences were largest within households, while later status differences were most evident between households, as land ownership

became the dominant source of wealth and power. Correlating material evidence of environmental change with that of changing settlement patterns suggests that the rise of interhousehold inequality, and its accompanying political and economic institutions, was enabled and encouraged by landscape transformation. Such an observation is possible only when the full materiality of the landscape is considered.

**Caval, Saša (University of Primorska, Slovenia)**

**[166]**

*Religion as a Social Adhesive in Colonial Mauritius*

Mauritius was a “terra incognita et nullius” for Europeans before the sixteenth century. With the arrival of the Dutch (1638–1710), French (1715–1810), and British (1810–1968) colonizers, and the bondsmen they brought, the island became a significant part of the global sugar production. The workforce was gathered from all around the Indian Ocean and beyond. Eventually, the island became home to many races, ethnicities, religions, and social classes. In the 1850s, the populations observed four major faiths with their denominations, and a local syncretic belief Longanis. The paper will present the role and effect of religions in the social life of the repressed in the colonial period in Mauritius.

**[166]**

*Chair*

**Caval, Saša (University of Primorska, Slovenia)**

**[185]**

*Discussant*

Cawthra, Hayley [151] see Fisher, Erich

Ceen, Allan [167] see Hunter Burkett, Meisha

Cencig, Elsa [148] see Ryan, Karen

Cera, Katherine M. [11] see McKee, Brian

**Cercone, Ashley (University at Buffalo)**

**[74]**

*Can You Predict the Pot? Using Morphometric Variability to Predict Potting Techniques*

**[WITHDRAWN]**

Cerezo-Román, Jessica [40] see Hanson, Annalys

**Cesaretti, Rudolf (Arizona State University), Carlos Cordova (Oklahoma State University) and Charles Frederick**

**[30]**

*Analysis and Implications of Postdepositional Bias in the Basin of Mexico (BOM) Surveys: A Preliminary Case Study of the Texcoco Survey Region*

The Basin of Mexico (BOM) regional surveys have been a cornerstone of archaeological inferences about prehispanic demography and political and economic organization over the long term. However, recent geoarchaeological fieldwork in the BOM has indicated patterned geomorphological biases in the regional surveys, notably the repeated phases of Holocene alluvial deposition obscuring remnants of prehispanic landscapes from surface survey. This preliminary study uses geophysical techniques to analyze and estimate postdepositional biases in the Texcoco survey region data. Survey data, 5 m lidar DEMs, and other INEGI geospatial data clearly detect the geomorphic features documented in fieldwork, enabling us to map the signatures of past geomorphic processes. Using these process-based geomorphic signatures, machine learning, and non-linear regression, we model the probability and degree of postdepositional bias. This highlights areas where surface sites would be obscured by deposition and modern land use (both at the time of the survey and today). Early sixteenth-century ethnohistoric data then facilitate the predictive modeling of Aztec settlement corrected for the estimated error in survey site recovery. These techniques highlight the potential magnitude and theoretical implications of systematic biases in the BOM survey data, as well as identify fruitful areas for excavation and subsurface remote sensing.

Cesaretti, Rudolf [101] see Blumenfeld, Dean

**Chacon de Hernandez, Marcia (Universidad de San Carlos; Mirador Basin Project)**

**[48]**

*Investigaciones en el Grupo Sereque, Complejo La Danta, El Mirador, Petén: Resultados 2015–2018*

Investigaciones en el Grupo Sereque han enfocado en la estructura principal conocida como Edificio 5A7.1 del Grupo Sereque, que corresponde al complejo La Danta. El grupo está ubicada al norte sobre una elevación y área de cantera y está conectado directamente a la primera plataforma de la Danta por una calzada de aproximadamente 500 m. El complejo y calzada asociados

habían sido localizados a través del sistema lidar. La estructura presenta una arquitectura monumental compleja. Como parte del programa de entender los orígenes y las dinámicas del desarrollo de la arquitectura preclásica monumental alrededor del gran Complejo La Danta, se nota un rol importante vinculado con lo político y ceremonial de la pirámide y el sitio El Mirador. La estructura presenta características o rasgos constructivos especiales, como los bloques megalíticos, que conforma la parte superior y central del edificio, y esquinas redondeadas y un patrón de nivelación con bloques en la parte central de la estructura. Excavaciones ya han revelado el carácter única de su construcción, y las posibles utilidades del edificio en el desarrollo cultural Preclásico.

Chadrabaal, Enkhtuul [93] see Piezonka, Henny

Chadwick, William [19] see Ford, Ben

**Chan, Amy (California State University, Los Angeles)**

**[158]**

*When You're Feeling Blue: Maya Blue Fibers in Dental Calculus of Sacrificial Victims*

Surveyed in 2008–2010, Midnight Terror Cave contains the commingled remains of at least 118 Maya sacrificial victims from the Classic period (250–925 CE). Although previous studies have shown Maya populations to have high dental caries rates and enamel hypoplasia corresponding with weaning, the Midnight Terror collection does not fit this trend. Given the minimal dental calculus present, two samples were taken from six teeth. Samples were divided by operation, three teeth from each. Samples were sent to the PaleoResearch Institute for analysis where they were examined for pollen, phytoliths, starches, and other inclusions. Aside from organic components, both samples were found to contain blue fibers that were ruled out as being contamination. Given the time frame needed to encase the fibers within calculus, the fibers were introduced several days or weeks prior to death, likely in the form of a gag. Victims were painted blue before being paraded to the sacrificial site. This is the first known physical evidence matching the ethnohistoric accounts of this treatment of sacrificial victims.

Chapdelaine, Claude [103] see Gates St-Pierre, Christian

**Chapman, Ellen and Victoria Ferguson (Monacan Indian Nation)**

**[163]**

*Toward a Decolonized CRM: Challenges in Archaeological Stewardship and Interpretation for Virginia Tribes*

Long overdue federal acknowledgment of Virginia's tribes has created a sea change for many of Virginia's tribal communities over the last five years. Virginia now has seven federally recognized resident tribes, and an additional five tribes have state recognition. Virginian erasures of Native history have been created not primarily through physical removal but by state-coordinated demographic erasure, an underinvestment in scholarly research for much of the twentieth century, and ignorance regarding community persistence. While cultural resource management represents a critical opportunity for the recovery of some aspects of tribal histories, some projects exacerbate this erasure due to flaws such as a lack of research into nineteenth- and twentieth-century tribal history, use of outdated boilerplate language, unqualified contractors receiving work due to low bids or non-competitive contracts, and pro forma or late outreach. This paper discusses some examples of recent issues facing Virginia tribes as they consult on federal projects.

**Character, Leila (University of Texas, Austin) and Agustin Ortiz Jr. (Naval History & Heritage Command)**

**[184]**

*Automatic Identification of Shipwrecks Using Digital Elevation Data and Deep Learning*

The objective of this project was to create a deep learning model that uses digital elevation data to automatically identify shipwrecks. The model uses a convolutional neural network architecture and has a F1 score of 0.92. Deep learning modeling based on remotely sensed imagery is a rapidly expanding area of research within the field of computer science, but deep learning is far less common in archaeology. Applications of deep learning are even more rare in the field of underwater archaeology. The shipwreck model, which is being completed under the aegis of the Navy's Underwater Archaeology Branch (UA), is based on open source topo-bathymetric data and shipwreck data available from NOAA's Data Access Viewer and NOAA's Wrecks and Obstructions Database, as well as UA's records. This model may help the Navy's Office of Underwater Archaeology (UA) to find new features, create more accurate and complete maps of shipwreck locations, study patterns across the landscape, and aid management objectives. This model can easily be adjusted to identify other types of features, even using multispectral or RGB imagery as input. This work seeks to make machine learning methods accessible to non-computer scientists interested in study, management, and conservation of the landscape.

**[184]**

*Chair*

Charlton, Michael [96] see Martinez Milantchi, Maria Mercedes

**Chase, Adrian (Arizona State University)**

**[56]**

*Discussant*

**Chase, Adrian (Arizona State University)****[137]***Reconstructing and Testing Ancient Neighborhoods at Caracol, Belize*

Neighborhoods in the past formed in urban contexts from the bottom-up through repeated face-to-face interactions. Through these shared social experiences and relational identity, neighborhood groups would possess a high potential for collective action, facilitating local solutions to issues facing these communities. In addition, these neighborhoods would have possessed higher intragroup cohesion for the above reasons. While we cannot ask the deceased who they interacted with and for how long, we can reconstruct likely zones of repeated face-to-face interaction. Previous methods of neighborhood reconstruction have often utilized clustering algorithms focusing on straight line distance. As such, these methods are not well suited to rugged, hilly landscapes. Instead, this research uses a combination of least cost paths, clustering, and social network analysis principles to reconstruct neighborhoods for the last phase of occupation at the Classic period Maya city of Caracol in modern Belize. In addition, comparison of ritual deposits from caches and burials within plazuela housemound groups sheds additional light on these communities. This excavated material permits testing of these reconstructed neighborhood boundaries. Four neighborhoods provide a minimal dataset to distinguish the effects of district marketplaces and neighborhood identity and ascertain the validity of this neighborhood reconstruction method for Caracol, Belize.

**[137]**

Chair

Chase, Adrian [104] see Chase, Arlen

Chase, Adrian [104] see Chase, Elyse

Chase, Adrian [181] see Martindale Johnson, Lucas

**Chase, Arlen (Pomona College), Diane Chase (Claremont Graduate University) and Adrian Chase (Arizona State University)**  
**[104]***Population Estimation in Ancient Mesoamerica: Retrospective and Prospective*

The determination of accurate population numbers for ancient Mesoamerican societies is key for making interpretations about past levels of complexity. This is not only necessary for understanding how societies changed over time but also for how they were organized over space. The techniques that Mesoamericanists use vary depending upon area of research. In the highlands, population numbers are usually determined as a result of surface surveys and estimations of people based on hectares of land that were occupied. In the lowlands, estimations are often based on numbers of mapped mounds and an extrapolation of occupants per mound and area occupied, with change over time often based on dated sherd material recovered through a testing program. The use of different methodologies has led to divergent interpretations about the sizes of ancient Mesoamerican populations and the density of settlement. The addition of lidar helps in defining the limits of centers and settlement, especially in the lowlands, and this technology obviates the former need for extrapolations about settlement extent. How population numbers are determined has implications for interpretations related to urbanism and sociopolitical complexity throughout Mesoamerica. This paper seeks to codify past approaches and present newly viable options for approaching ancient population histories.

**[104]**

Chair

Chase, Arlen [136] see Chase, Diane

Chase, Arlen [104] see Chase, Elyse

**Chase, Diane (Claremont Graduate University) and Arlen Chase (Pomona College)****[136]***Economy and Sociopolitical Change at Classic Period Caracol, Belize*

Maya economic systems were neither static nor simplistic. Research at Caracol, Belize, has shown that the site's Late Classic inhabitants received the bulk of their goods and services from markets that were embedded within the city. Whereas some researchers have postulated the existence of a dual economic system for the Maya in which quotidian and prestige goods operated within different realms, the goods that were distributed through Caracol's Late Classic period markets do not support the division of the economic system into two units, tradewares and ritual items had widespread distribution in residential groups at the site. The urban landscape of Caracol manifests continuous agricultural terracing dotted with numerous residential groups. The site's causeways join the outlying public architecture to the city's central hub providing ready passage across the site. The large plazas at these outlying nodes permitted not only easy access to goods and services but the assembly of numerous people. Thus, the Late Classic period economic system and markets served to integrate the site's inhabitants. However, Caracol's socioeconomic system was dynamic and changed dramatically in the subsequent Terminal Classic period, when greater socioeconomic divisions existed and elite and non-elite members of society accessed largely different material items.

Chase, Diane [104] see Chase, Arlen

Chase, Diane [104] see Chase, Elyse

**Chase, Elyse (Stanford University), Adrian Chase (Arizona State University), Diane Chase (Claremont Graduate University) and Arlen Chase (Pomona College)****[104]***Population History for Caracol, Belize: Numbers, Complexity, and Urbanism*

Caracol, Belize, is among the largest known ancient Maya cities. Its urban area spans some 200 km<sup>2</sup> and is integrated by a series of radial causeways that connect outlying public architecture and plazas to the central hub. The entire landscape is covered by residential settlement and agricultural terracing, making Caracol a truly green city. Excavation and an extensive sampling program

at Caracol have demonstrated that almost all residential groups were occupied during the Late Classic period. Since the early 1990s, the population at CE 650 for Caracol has been estimated as being some 100,000 people. Lidar imagery has confirmed the scale of settlement and various calculations corroborate these numbers. Excavation and sampling further permit a reconstruction of the site's population history. While lidar is an incredible asset for settlement study, comparing intensively mapped settlement areas with lidar imagery reveals that approximately one-third of the lowest-lying structures in Caracol's residential groups are not immediately visible in lidar hillshades. This has implications for the interpretation of lidar hillshades elsewhere and suggests that structure density from on-the-ground mapping will actually be higher than estimates based solely on lidar. However calculated, Caracol's ancient population operated within a complex urban system.

**Chase, Zach (Brigham Young University) and Steve Kosiba (University of Minnesota)**  
[182]

*Memories of New Pasts in Cuzco and Huarochiri*

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 socio-political 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.

Chase, Zach [182] see Anderson, Ridge

Chase, Zach [118] see Littledale, Sylvie

Chatters, James [39] see Brown, James

Chauca, George [128] see Morrisset, Sara

Chavez, Juan [106] see Gaspar, Karla

**Chavez, Stanislava (Wayne State University)**

[45]

*Political Organization of the Tiwanaku Polity: A View from Copacabana*

Tiwanaku has been described as an expansive state by archaeologists working in the first half of the twentieth century. At that time, the idea of a powerful empire in Bolivian prehistory aided and reinforced the nationalistic political narrative. However, archaeological data does not support the idea of Tiwanaku military expansion. Therefore, subsequent researchers proposed other models, such as nested hierarchies within a segmentary state, emphasizing the ceremonial importance of the Tiwanaku ceremonial center and mechanisms of reciprocity, rather than a centralized government with military power. Archaeological evidence from the Copacabana Peninsula supports models viewing Tiwanaku as the prestigious ceremonial center of a wide religious and cultural sphere of influence, rather than the political capital of a large state. Moreover, the Tiwanaku polity, while innovative in terms of spectacular monumental architecture, in many ways was a continuation of earlier cultural processes taking place in the Lake Titicaca Basin. Recent extensive archaeological work on the Copacabana Peninsula shows integration into the Tiahuanaco sphere of prestige while maintaining local traditions.

Chechushkov, Igor [148] see Fitzhugh, William

**Chen, Caleb (University of California, Davis), Meredith Carlson (University of California, Davis), Peiqi Zhang (University of California, Davis), Daniel Goring (University of California, Davis) and Tammy Buonasera (University of California, Davis)**  
[31]

*Comparing Energy Expenditures of Mortar and Pestle and Grinding Slab Technologies*

Daily activities such as grinding plant material require energy input. It is ideal to put in the least amount of work to obtain the greatest yield of product. Energetic expenditures and returns for grinding slab and mortar and pestle use remain largely unstudied. In this study, resting and grinding heart-rate data are recorded and used with grinding efficiency data to determine the best energetic returns for several types of mortars versus a shallow basin grinding slab. These data are further considered along with return rates from two resources, black oak acorn (*Quercus kelloggii*) and Indian ricegrass seed (*Achnatherum hymenoides*). It is expected that technologies with the highest grinding rates will have the best energetic returns. This may be amplified by differences in caloric values for different resources.

Chen, Caleb [31] see Carlson, Meredith

Chen, Caleb [31] see Zhang, Peiqi

**Chen, Hsi-Wen**

**[100]**

*Land Use in Neolithic Northeast China*

Hongshan societies (4500–3000 BC) in Northeast China were the first to witness a dramatic increase in population since the adoption of agriculture and a sedentary way of living were embraced some 9000 years ago in the region. Many aspects of Hongshan social dynamics have not been fully elucidated in detail. Regional surveys explore human-land relationships at a regional scale and reveal inconsistent extents to which agricultural productivity served as a major determinant of settlement patterns in different survey areas. A conceptualization of land-use in Neolithic Hongshan times provides a way of thinking about the deviating patterns of population distribution.

**Chen, Ran (University of Arizona) and Yue Wu (University of Science and Technology of China)**

**[1]**

*Beyond Projectiles: Experimental Study of Microblades as Cutting Tools*

The miniaturization of lithic artifacts indicates a significant shift in lithic technology and functions since the Upper Paleolithic, revealing a probable shift in subsistence strategy. Microblades are specific kinds of small stone tools that occur in sites dating back to the Upper Paleolithic through Neolithic in many parts of the world. Although it is widely recognized that microblades were used as multi-functional tools, most experimental studies are focused on microblades as part of a composite tool system for use as projectiles or spears. A non-projectile perspective is applied in this study of chert microblades as cutting tools. Different plant and animal materials with different levels of hardness were processed experimentally to reveal specific use-wear patterns from cutting and scraping. A multi-stage sequential analysis using both low-power and high-power observation methods examined the appearance of different stages of use-wear. The results show that using microblade as knives can produce different diagnostic use-wear from different tasks in comparison to typical projectile features. This experiment provides new perspectives and generates new data to understand the function of microblades on plant and animal materials.

**Chen, Yichun (University of Washington) and Ben Marwick (University of Washington)**

**[144]**

*Correlations between Gender and Research Topics at Three Major Archaeology Conferences*

Disproportionate representation of genders has long existed in many academic fields. Rising interest in gender equality in society generally has resulted in greater scrutiny on gender inequality in academic communities. Analysis of authorship of peer-reviewed publications shows that archaeology is similar to other academic fields in having long been dominated by men. We ask if gender disproportionality is evident in the choice of topics that archaeologists present on at major conferences, particularly the Society of American Archaeology (SAA), the European Association of Archaeologists (EAA), and the Computer Applications and Quantitative Methods in Archaeology (CAA) meetings. Does the gender of the participants in these archaeological conferences correlate with the topics of their presentations? We analyzed presenters' names in the published programs of these three archaeology conferences to infer gender. We then used machine learning to identify topics from presentation titles. We found that there are some associations between gender and topics. An awareness of these correlations between research topics and gender is important to ensure equitable participation in archaeology, and unbiased access to training opportunities for students. We expect these findings to be useful for instructors who prioritize gender equality in student and early career research activities.

Cherkinsky, Alexander [68] see Napora, Katharine

Chesson, Meredith S. [94] see White, Chantel

Chhay, Rachna [150] see Heng, Piphal

**Chicoine, David (Louisiana State University)**

**[136]**

*Discussant*

**Chicoine, David (Louisiana State University), George Lau (Sainsbury Research Unit, University of East Anglia) and Jacob Bongers (Sainsbury Research Unit, University of East Anglia)**

**[159]**

*Post-Chavín Political Developments in Ancash: Comparative Perspectives from the Nepeña and Pallasca Regions*

In this paper, we present preliminary results of our 2019 excavations at the centers of Cerro San Isidro (Nepeña) and Pashash (Pallasca) in the Moro and Cabana regions of north-central Peru, respectively. Both are multicomponent hilltop sites that developed into major post-Chavín elite centers and witnessed a series of later occupations. Data on occupational sequences, fortifications, ceremonial architecture, offering contexts, and material culture are presented to shed comparative light on post-Chavín political developments in two neighboring regions that witnessed apparently quite different trajectories following the demise of the Chavín phenomenon. We focus on materialities of post-Chavín developments and their impact on the rise of new forms of political authority, including the strategic reuse, manipulation, and ritual engagement with abandoned places, buildings, and things. The comparison helps frame new understandings of about the proliferation of divine lordships in Ancash and the central Andes more broadly.

**Childs, S. Terry (Retired, Department of the Interior)**

[110]

*Moderator*

[110]

*Discussant*

**Childs, S. Terry (Retired, Department of the Interior)**

[183]

*Discussant*

**Chilton, Elizabeth (UMass Amherst)**

[57]

*Discussant*

Chinchilla, Oswaldo [181] see McCormick, David

**Chiou, Katherine (University of Alabama), Di Hu (James Madison University), Andrew Warnes (University of Leeds) and Psyche Williams-Forsen (University of Maryland, College Park)**

[156]

*Intersectionality and the Archaeology of Commensality*

To food scholars, meals serve as microcosms of the world at large. Those interested in disentangling the complex relationship between food and structural inequality must simultaneously engage many dimensions of social life including class, race, ethnicity, gender, status, ritual, and religion. Since Kimberlé Crenshaw's groundbreaking 1989 article introducing the theory of "intersectionality," scholars have applied intersectionality to diverse contexts, demonstrating how multiple axes of identity translate to differential access to privilege and experiences of oppression. In the realm of food studies, intersectional approaches have led to fresh insights about the reproduction of social inequality and food insecurity. In this paper, we aim to articulate the theories and methods most effective in the analysis of identity, inequality, and commensal politics. What formulation of intersectionality theory is most appropriate for the study of archaeological foodways? What innovative insights can we gain by explicitly analyzing the intersection of two or more axes of identity? What are the methodological challenges to seeing "intersectionality" in the archaeological record? The archaeological study of commensal politics from an intersectional perspective has the potential to uncover narratives that challenge conventional wisdom about how inequality and difference were/are created and maintained.

[156]

*Chair*

**Chiou, Katherine (University of Alabama)**

[190]

*Discussant*

Chiou, Katherine [5] see Hatcher, Lawford

Chirinos Ogata, Patricia [69] see Toohey, Jason

Chmura, Matt [28] see Blank, John

**Christenson, Allen (Brigham Young University)**

[59]

*Places of Emergence: Water and Cave Ceremonialism in the Tz'utujil Region*

Throughout the highlands of Guatemala, Maya traditionalists believe that mountains and their associated cave openings are the "mouths of the world" giving access to spiritual realms inhabited by sacred beings that have influence over natural phenomena of importance to the outside world. Each of these caves or watery portals is a world center. They are not considered rival claimants to be the "true" center. Each may be just as powerful as a place of emergence or the birthplace of clouds, rain, germination of seeds, etc. It is the ritual actions that take place there that make it life-engendering, not its physical location. Thus, each cave is the central axis point of the world because it leads to the place where revered ancestors, saints, and deities live. The Maya perceive time as cyclic and believe that at regular intervals the world must be ceremonially rebirthed to continue. Nearly all major highland Maya ceremonies deal with creation and rebirth in one way or another. It is this periodic renewal that allows life itself to continue.

**Christie, Jessica (East Carolina University)**

[90]

*Discussant*

[90]

*Chair*

**Christie, Jessica (East Carolina University)****[111]***Walled Rock Wak'as on Inka Royal Estates in the Heartland*

This paper analyzes early state formation and integration of local groups at two royal estates, Tipon and Písaq. Tipon, southeast of Cusco, began as a Killke period settlement before 1400. It functioned as outpost in the buffer zone between the Muyna and Pinagua in the Lucre Basin and the growing Cusco polity. Wiraqocha Inka turned Tipon into his royal estate. Písaq, in the Vilcanota Valley, was developed into a royal estate by Pachakuti on land annexed from the Cuyo. Both estates exhibit a walled-in modified rock outcrop in close vicinity to Cusco-style architecture. The discussion will compare and contrast the individual settings of the estates and rock *wak'as* as repeated markers of Inka state authority. Andean settlements grew from the union of a localized *wak'a* with its territory and the people this *wak'a* favored. The Inka seized local *wak'as* and often redefined them as active agents of the state near architectural spaces where ideological performances occurred to impose a new imperial order. The physical differences between the outcrops (uncarved versus geometric sculptures) suggest that whereas the new order of the Inka state was taxonomic and essentialized, it allowed flexibility in how to materialize and visualize it.

Christopher, Lauren [173] see May, Alejandra

**Cianciosi, Alessandra (University of Amsterdam)****[185]***Moderator*

Ciomek, Katarzyna [53] see Palonka, Radoslaw

Ciugudean, Horia [4] see Ivins, Erica

Ciugudean, Horia [13] see Dorr, Lana

**Civilyte, Agne****[78]***Archaeology of Materials: An Overview of Amber Use in Prehistory*

Amber is still today a material which is highly appreciated in modern societies. To use amber means to be part of the tradition of thousands of years. The topic "amber in prehistory" became very popular in the last decades in European archaeology. It shows a huge potential for understanding the use practices of special materials in prehistoric societies. Baltic amber (succinite) is the best-known fossil resin among the archaeological material. The largest deposits of amber occur naturally along the southern, southeastern and eastern coasts of the Baltic Sea, thus the theory of the "Northern gold" and its route became most popular. Nonetheless, other sorts of fossil resins, such as Sicilian, Siberian, Lebanon, Canadian, and Dominican amber, could be used as well. This paper gives the overview of the distribution and context of prehistoric amber finds in and around Europe as well as in Caucasus, Asia, and non-continental regions to recognize the patterns of use of this shiny and very special material and to make a database for the future investigations. The aim of this paper is to draw attention to distribution and forms of amber artifacts and to identify the function and meaning of amber in the prehistoric societies.

**Claassen, Cheryl (Appalachian State University)****[72]***Helmets and Wind Jewels*

An exploratory look at Helmet shell use during the Woodland period and *Busycon* columella "wind jewels" in the Mississippian period. The investigation is informed by Mesoamerican shell symbolism.

**Clariza, M. Elena****[121]***Discussant***Clark, Alexis (Advisory Council on Historic Preservation) and Jeffrey Blomster (George Washington University)****[102]***"International" Concepts: A Design Analysis of Yanhuítlan Red on Cream Ceramics from Postclassic Etlatongo*

While the Mixtec region of Oaxaca is famous for its polychrome ceramics, including the iconographically rich "codex style" pottery, in this paper we argue that non-polychrome ceramics also played a significant role in conveying particular messages associated with ongoing social and political rearticulations during the Postclassic period (AD 900–1521). Following Michael Lind's influential ceramic study from Yucuita and Chachoapan, we present a design analysis of Yanhuítlan Red on Creams (YRC) from the nearby site of Etlatongo. By deconstructing Lind's foundational "design motifs" into separate design units, we compare the presence and frequency of designs found on YRC ceramics between the three sites. This study demonstrates that YRC vessels shared a basic design layout, while the presence or absence of design elements suggests an aspect of choice in selecting specific decorations over others. However, the characteristics of this ware also display a connection to broader Mesoamerican aesthetic values from this period, known as the Postclassic International Style. We suggest that these designs, familiar and "legible" to a wide audience, may have been utilized as narrative tools in the ritual performance of commensal events.



Clark, Bonnie [21] see Gilmore, Kevin

**Clark, Dylan (North Carolina Office of State Archaeology)**

[59]

*The Construction and Activation of Place at the Maya Port of Isla Cerritos*

Mesoamerican ports were not only settings for exchange but also communities with residential populations and dynamic shared identities that contributed to both coastal and inland cultural landscapes. Ancient ports commonly incorporated a variety of sacred architecture and symbolism to accommodate visitors from distant places, along with their cosmologies, and reinforce the neutrality of places of exchange. Excavations at the Maya coastal port of Isla Cerritos indicate a long history of human occupation from 300 BCE on and suggest that the island was one part of a multicomponent community, connected to mainland segments, artificial canals, and freshwater springs. Island sites are particularly salient expressions of the *altepetl*, or water-mountain concept, with visual sight lines to horizons and distant landscape features. Perhaps the most famous example of an archetypal “water-mountain” islandscape is Tenochtitlan, whose ceremonial precinct became the axis mundi of Anahuac. In this paper, I discuss place-making (and re-making) that took place at Isla Cerritos between 800 and 1100 CE, including the expansion of the islandscape and modification and ritual activation of domestic architecture and sacred geography. Port residents used these to actively forge and alter social and political alliances and regional networks with interior cities and other coastal communities.

Clark, Geoffrey [83] see Napolitano, Matthew

Clark, Geoffrey [140] see de Lombera-Hermida, Arturo

**Clark, Jeffery (Archaeology Southwest)**

[37]

*Chair*

Clark, Jeffery [46] see Smith, Jaye

**Clark, Morgan (Brown University)**

[189]

*The Ear Ornaments of the Ancient Maya*

More than mere accessories, the earflares that ancient Maya peoples donned were essential. Nothing indicates this more than the fact that their ornamental use was not limited ears; indeed, elite bodies dripped with them. Stelae from Tikal and Cobá depict rulers with long strings of them around their necks. Some earflares, as with an example from Pomona, are too large to be worn, while others are shown secured to headdresses, masks, belt assemblages, wrists, and ankles. While the ubiquity of these objects is evident, a comprehensive understanding of them is lacking. In order to address this deficiency, this study will attempt a systematic collection and interpretation of earflare data from a large sample of Maya sites. The data collected will include details that have been made available in archaeological reports, such as the materials, sizes, contexts, and decorative features of earflares, along with information that can be gleaned from the way earspools are represented—i.e., how they appear in the hieroglyphic and visual record. The analysis and interpretation of earflare data that is achieved here will support the study's central claims about their value, production, distribution, and social meaning.

[189]

*Chair*

**Clauss, Lee (San Manuel Band of Mission Indians)**

[60]

*Discussant*

**Clayton, Sarah (University of Wisconsin-Madison)**

[177]

*Life after Teotihuacan: Everyday Practices and Community Formation at Chicoloapan, Mexico*

The Epiclassic period (550–850 CE) in central Mexico is widely viewed by archaeologists as a time of instability, violent conflict, and large-scale migration. The collapse of Teotihuacan left a fractious and decentralized sociopolitical landscape in its wake—a situation that contrasted starkly with the consolidated, macroregional system that the state had dominated. However, this tumultuous period was also marked by resilience and innovation as people reconfigured social and economic networks, adopted novel practices and institutions, and created new communities. Many of these communities, which were politically independent and relatively self-sufficient, persisted for multiple centuries. Everyday life within them has received little attention in comparison to broader transformations, such as shifting regional settlement patterns. In this paper, I examine the day-to-day practices of residents of Chicoloapan, an Epiclassic settlement in the southern Basin of Mexico, through the lens of domestic material culture (ceramics, lithics, and architecture). I consider the ways in which local foodways, domestic ritual, and forms of supra-household interaction contributed to the early formation and long-term maintenance of an autonomous community, under conditions of regional political instability.

[177]

*Chair*

Clayton, Sarah [177] see Barba, Luis

Cleghorn, Naomi [40] see Keller, Hannah  
 Cleghorn, Naomi [151] see Watson, Sara

Cleveland, Mitchell [26] see Benning, Maxwell  
 Cleveland, Mitchell [26] see Gilmore, Eric

Clifton, Julia [183] see McBrinn, Maxine

**Cobb, Peter (University of Hong Kong)**  
**[78]**

*Sometimes at the Crossroads: Preliminary Results from New Fieldwork on the Southeast Ararat Plain of Armenia*

The Ararat Plain, part of the upper Araxes River valley system in the South Caucasus mountains, represents the largest expanse of arable land in Armenia today. At the southeastern edge of this plain, the Vedi River valley, a tributary to the Araxes, connects the agricultural zones of the plain with the resource-rich mountains and Lake Sevan to the east. The summer of 2019 saw the initiation of a new landscape-oriented research project to investigate past life and mobility through this valley, particularly in the Bronze and Iron Ages. Extensive survey and test excavations identified and characterized multiple new sites. The primary focus of the season was the start of excavations at a high fortified site with a commanding and controlling view of the valley, called the Vedi Fortress. This multi-period site holds promise to enhance our knowledge about pre- and proto-historic phases of this part of Armenia. Our project interrogates the militaristic landscapes of the Late Bronze and Iron ages and compares the deployment of the same spaces during the Medieval period. This born-digital project deploys 3D capture of contexts and objects toward the goal of enabling comprehensive digital analysis of complete excavation datasets.

**Coco, Emily (New York University) and Radu Iovita (New York University)**  
**[100]**

*Time-Dependent Taphonomic Site Loss Leads to Spatial Averaging: Implications for Archaeological Cultures*

Archaeologists typically define cultural areas on the basis of similarities between the types of material culture present in sites. The similarity is assessed in order of discovery, with newer sites being evaluated against older ones. Despite evidence for time-dependent site loss due to taphonomy, little attention has been paid to how this impacts archaeological interpretations about the spatial extents of material culture similarity. This paper tests the hypothesis that spatially incomplete datasets result in the detection of larger regions of similarity. To avoid assumptions of cultural processes, we apply subsampling algorithms to a naturally occurring, spatially distributed dataset of soil types. We show that there is a negative relationship between the percentage of points used to evaluate similarity across space and the absolute distances to the first minimum in similarity for soil classifications at multiple spatial scales. This negative relationship indicates that incomplete spatial datasets lead to an overestimation of the area over which things are similar. Moreover, the location of the point from which the calculation begins can determine the size of the region of similarity. This has important implications for how we interpret the spatial extent of similarity in material culture over large distances in prehistory.

**Codding, Brian (University of Utah), Kate Magargal (University of Utah), Douglas Bird (Penn State University), Rebecca Bliege Bird (Penn State University) and David Zeanah (Sacramento State University)**  
**[175]**

*Resource Acquisition Risk as a Driver of Subsistence Transitions*

Explaining major subsistence transitions in human prehistory requires an evaluation of the costs and benefits past people experienced. All too often, these trade-offs are explored solely by analysis of central tendency (i.e., mean returns), without exploring the distribution of possible outcomes. Here we explore how acquisition risk, or variance in expected returns, is an equally (if not more) important factor to consider when examining past and present subsistence transitions. We model this using quantitative ethnographic data and simulated archaeological proxies to evaluate the role of resource acquisition risk as a driver of past subsistence transitions.

Codding, Brian [39] see Allgaier, Paul  
 Codding, Brian [39] see Contreras, Daniel  
 Codding, Brian [54] see James, L. Brock  
 Codding, Brian [95] see Vernon, Kenneth  
 Codding, Brian [39] see Wilson, Kurt

**Codlin, Maria (Boston University)**  
**[94]**

*Hunting and Husbandry at the Ancient Mexican City, Teotihuacan*

Mesoamerica is a unique example of a center of urban development that thrived in the absence of large domesticated animals. And, while turkeys and dogs have a long history of domestic production in Mesoamerica, at the metropolis of Teotihuacan, we lack clear evidence that dog and turkey husbandry were major components of the urban economy. Recently, scholars found that captive management of wild carnivorous animals and cottontail rabbits was key to sourcing animals for state rituals and domestic consumption. Nonetheless, a large proportion of animal remains recovered from Teotihuacan derive from wild-hunted animals. This project examines the role of hunting practices and animal management in supplying animals for domestic consumption at Teotihuacan, and presents new data from Tlajinga and Tlailotlacan (the Oaxacan Barrio)—two ethnically distinct neighborhoods in

the southern and western sectors of the city. By integrating zooarchaeological and collagen-based identification methods with isotopic analysis, this research presents new insights into the diversity of avian fauna, and the management of turkeys and leporids consumed at the site. I argue that wild foods made up a major component of the diet at Tlajinga, while contrasting consumption patterns at the two neighborhoods emphasize the diversity of subsistence strategies employed at Teotihuacan.

[94]

Chair

Codlin, Maria [101] see Carballo, David

Coffey, Grant [26] see MacMillan, Vincent

Coffey, Grant [26] see Schwindt, Dylan

**Colaninno, Carol (Southern Illinois University, Edwardsville), Emily Beahm (Arkansas Archeological Survey Winthrop Rockefeller), Carl Drexler (Arkansas Archeological Survey University of Arkansas), Shawn Lambert (Mississippi State University) and Clark Sturdevant (Southern Illinois University)**

[81]

*Improving Equity, Access, and Professionalism at Archaeological Field Schools through the Prevention and Reduction of Sexual Harassment and Assault*

Research documents the prevalence of sexual harassment in higher education and archaeological learning and working environments. The harassed generally are those with little power: students, trainees, and early career professionals, particularly women, LGBTQ+, and BIPOC individuals. Harassment early in peoples' educational and career pursuits can cause them to leave the field and leave behind potentially impactful careers, depriving the discipline of important contributions. Though not addressed in prior research in the educational landscape of archaeology, this harassment may be prevalent at field schools. In 2020, we began a three-phase research program, funded by the National Science Foundation, to investigate policies and procedures that field school directors can implement that prevent and reduce harassment, while creating a learning environment that is safer and more inclusive for students. We report our results of a survey initiated in spring 2020 that asked respondents about practices they implement to reduce and prevent harassment ( $n = 70$ ). We also report the results of a document analysis of field school syllabi ( $n = 24$ ) that reviewed practices implemented. From these results we propose several recommendations that may help create field schools that are safer and more inclusive for students traditionally underrepresented in archaeology.

**Coleman, Caitlin (ASI)**

[187]

*Hello from the Other Side: Knowledge Dissemination from CRM Archaeology in Ontario*

For the last five years I have been working on disseminating knowledge about heritage and archaeology through my role as assistant manager of communications at ASI, Ontario's largest cultural resource management company. My goal has been to make information about our current work accessible, by tailoring the messaging to a variety of platforms and audiences. I will be discussing the challenges and successes in sharing our work with the broader public, through digital platforms and hands-on events, all while balancing the communication needs of a business. Our communications are not tailored solely to the public; we also consider descendant communities, clients, colleagues, and coworkers to be key audiences. I will discuss how I tailor our communications to reach this wide range of individuals who have varying levels of expertise and interest, all while prioritizing accuracy, sensitivity, and accessibility.

**Collins, Benjamin (University of Manitoba), Ayanda Mdludlu (University of Cape Town), Jayne Wilkins (Griffith University), April Nowell (University of Victoria) and Christopher Ames (University of Wollongong)**

[151]

*Evolving Social Networks during the Late Pleistocene: An Interior Perspective from Grassridge Rockshelter, South Africa*

Humans are social beings and being able to track social interactions and relationships across space and through time is a major focus of both anthropological and archaeological research. Within archaeology, the scale and intensity of social interactions has been related to the pace of cultural and technological innovations, which in turn produces a major influence on mobility, material culture, and a multitude of other cultural facets in past societies. This paper will present data from the lithic and personal ornament (marine and ostrich eggshell bead) assemblages recovered from the Late Pleistocene archaeological record (~45,000–11,600 years ago) at Grassridge Rockshelter, Eastern Cape, to provide an interior grasslands perspective on the archaeology of this region during these time. Further, the data from Grassridge will be compared with other well-described sites in the broader area to discuss the extent or absence of social networks at a regional scale.

[151]

Chair

**Collins, Ryan (Dartmouth College)**

[189]

*Sensing the Subterranean: Problems and Prospects of GPR Survey at Yaxuná, Yucatán, Mexico*

This paper explores methodological opportunities for comparative settlement survey by applying ground-penetrating radar (GPR) as an augmentative remote sensing lens. In the last decade, remote sensing in Mesoamerica has undergone a renaissance through the application of Lidar to survey the landscape, providing immense quantities of data on new potential features. Yet, Lidar does not reveal everything. Similarly, GPR data alone require interpretation and minimal ground-truthing. Nevertheless, recent novel uses of the technology have shown great promise for revealing large-scale hidden features across the landscape. Using the site of Yaxuná,

Yucatán, Mexico as an example, I argue that GPR can be an augmentative remote sensing lens to Lidar surveys. GPR survey and excavation revealed that Yaxuná's nearly 1 ha E Group plaza was set in a cleared expanse of naturally flat bedrock 2 m in depth lower than the surrounding landscape. Also, several large-scale architectural features, including architecture, causeways, and ritual features were detected and found to occur at distinct levels, showing the immense transformation of the site's urban core in over 500 years of development. While excavation was critical to confirming these features in Yaxuná, its extent and associated site transformation could not have been determined through excavation alone.

Coltman, Jeremy [154] see González López, Angel

Coltrain, Joan [39] see Wilson, Kurt

**Combey, Andy (Université Grenoble Alpes), Laurence Audin (ISTerre, Université Grenoble Alpes), Carlos Benavente Escóbar (Instituto Geológico Minero y Metalúrgico), Miguel Ángel Rodríguez-Pascua (Instituto Geológico y Minero de España, Madrid) and José Bastante Abuhadba (Archaeological Park of Machu Picchu)**

**[89]**

*Inka Dry Ashlar Masonry, a Deliberate Seismic-Proof Architecture? Reassessment through an Archaeoseismological Approach in the Cuzco Area, Peru*

For decades now, various scholars have assumed that the Inkas developed seismic-resistant construction techniques. While it is true that some architectural features are particularly well suited to face the seismic risk, no structural evidence can demonstrate with confidence the intentionality of the earthquake resistance.

As part of our research, we discuss and evaluate the Inkas' risk perception and management through an archaeoseismological-pioneering approach. Based on a field-tested methodology, our detailed survey intends to register architectural disorders caused by earthquakes on precolumbian sites of the Cuzco and Sacred Valley.

Crossed by numerous active faults, the Cusco region is subject to a strong seismic hazard. The dense human occupation for over 3,000 years makes thus archaeological remains valuable markers for paleo-seismicity characterization. Combined with other evidence of past seismic activity (fault trenching, lake coring, and ethnohistorical sources) we aim to date prehistorical earthquakes and assess their induced social effects.

In a similar manner to the 1650 and 1950 earthquakes that devastated the Cuzco city, our first results suggest the occurrence of an important seismic event during the Late Horizon (AD 1400–1533). By evidencing new paleo-events, our investigation is shedding a new light on the complex relation between Inkas and earthquakes.

**Comeca Ramirez, Gianina (Université de Rennes / UNT / UNMSM), Gabriel Prieto (University of Florida) and Pilar Babot (National University of Tucuman)**

**[159]**

*Scraping the Pots: Residue Analysis of Salinar Ceramic Vessels Found in Domestic Contexts at Pampa la Cruz, Huanchaco, North Coast of Peru*

In this paper, we present preliminary results of organic residues analysis taken from ceramic vessels found in domestic contexts at the site of Pampa la Cruz, north coast of Peru. This study emphasizes the importance of plant consumption among early fishermen populations against traditional assumptions that cultivated crops were of minor significant to these communities. More important, it opens the possibility of exploring the social and economic relationships between fishing and farming communities and even distant trade during the late early Horizon (cal BP) or after the Chavín sphere of interaction collapse. Our results show that the use of ceramic vessels was linked to the consumption of several fruits, tubers, and even *Theobroma* spp. "cacao," which to date is the earliest evidence of this species in the entire south Pacific coast. The identification of damage due to processing modes (grounding, boiling, roasting, and fermenting) in the starches of these taxa indicates that the stages reported by ethnographic literature for the making of sophisticated fermented beverages like chicha were carried out at the site. This shows the importance of activities associated with the production and consumption of fermented beverages among ancient fishing communities.

Comstock, Aaron [105] see Kooiman, Susan

Conard, Nicholas [151] see Bader, Gregor

Conard, Nicholas [72] see Wong, Gillian

Conesa, Francesc [123] see Bates, Jennifer

**Conkey, Margaret (UC-Berkeley)**

**[126]**

*Discussant*

**Conkey, Margaret (UC-Berkeley)**

**[153]**

*Discussant*

**Conlee, Christina (Texas State University), Corina Kellner (Northern Arizona University), Chester Walker (Archaeo-Geophysical Associates) and Aldo Noriega (Universidad Nacional Mayor de San Marcos)**  
[128]

*Huaca del Loro: A Wari Colony in Coastal Nasca*

Excavations at the site of Huaca del Loro in the Las Trancas Valley of the Nasca drainage have uncovered a Wari settlement, a cemetery with hybrid Nasca/Wari practices, and a large habitation area possibly for local support personnel. In the Wari sector, ground-penetrating radar (GPR) identified subsurface rectilinear architecture similar to that found at other Wari sites, and a large round structure. Excavations were focused in this sector to expose the architecture and it was determined that the rectilinear architecture is a Wari style compound, and that the round structure is a D-shaped temple (one of the first identified in coastal Peru). Material culture associated with the Wari architecture consists of local Loro ceramics, Wari style offerings, and limited amounts of Wari imperial ceramics. In the cemetery, a Nasca style "trophy" head individual was excavated from a looted multiple-individual tomb, suggesting local control over important cultural behavior. In the large habitation area, excavations uncovered *quincha* (cane) architecture in the local style along with Loro ceramics, suggesting this area was occupied by local people although future excavations are necessary to assess the nature of this sector.

Conlee, Christina [45] see Jennings, Justin

**Contreras, Daniel (University of Florida), Brian Coddling (University of Utah), D. Craig Young (Far Western Anthropological Research Group Inc.), Paul Allgaier (University of Utah) and Roxanne Lois Fajardo Lamson (University of Utah)**  
[39]

*Addressing Taphonomic Complications in the Use of Archaeological Radiocarbon Assemblages as Population Proxies: A Case Study in the Bonneville Basin*

One of the imperatives driving reconstructions of past demography is the desire to analyze the impacts of past climate changes on human populations. An increasingly popular tool is the analysis of archaeological radiocarbon record, but the very paleoclimate changes that are of interest also have geomorphic effects—and the consequent erosive and depositional processes figure in the archaeological record as taphonomic agents. Taphonomic effects have the potential to mask some population responses and exaggerate others, as the relative frequencies of archaeological radiocarbon dates from different periods can be structured not only by population but by these confounding factors. Here we use coupled geomorphic and archaeological data to assess the effects of local taphonomy in the Bonneville Basin, drawing on the relative frequencies of terminal Pleistocene and Holocene landforms to assess the likelihood of survival of archaeological material of different ages and to correct population estimates according.

Contreras, Daniel [39] see Wilson, Kurt

**Contreras-Sieck, Miguel (National School of Anthropology and History), Paola Everardo-Martínez (National School of Anthropology and History), Paloma Constanza Huerta-Chavez (National School of Anthropology and History), Alejandro Alvarado-Gonzalez (National School of Anthropology and History) and Víctor Acuña-Alonzo (National School of Anthropology and History)**

[55]

*A Call for Contextualized Ancient DNA Research in Mexico: The Importance of Developing Ancient DNA Collaborations that Further Education and Technology Transfer and Infrastructure in Developing Countries: Perspectives from Mexico's Experiences*  
[WITHDRAWN]

Cook, Anita G. [133] see Cank, Kristof

**Cook Hale, Jessica (University of Georgia)**

[98]

*A Tale Told . . . Signifying Nothing*

Submerged prehistoric archaeology by its nature depends intensively on natural science methods, particularly where topics such as submerged site formation processes are concerned. As such, it offers potential to advance the state of the art in both methodology and interpretation but must be applied with due care. I present here a case study that demonstrates this concern. In the search for a nondestructive, cost-effective method to "fingerprint" geochemical signatures in lithic corrosion created by submerged contexts, limitations in the methods were encountered. Results show promise for lithic studies in this discipline but underscore the need for critical interpretive methods. In addition to critiquing the method, I will offer suggestions for future approaches that may better accomplish study goals.

Cooke, Richard [178] see Sharpe, Ashley

**Cooley, Delaney (University of Oklahoma)**

[27]

*A Preliminary Assessment of Athapaskan Land-Use Strategies in the Central High Plains*

Athapaskans entered the Central High Plains as part of a large migration from the Yukon River Basin. As these populations left the basin and moved south, they encountered new resources, resource distributions, landforms, and competition with local communities that would have challenged their existing land-use strategies, including settlement and mobility. This research begins to examine how Athapaskan land use strategies changed in response to settling across these regions by analyzing the spatial patterning of Athapaskan sites to landscape features on the Central High Plains. This research focuses on the plains and foothills of Colorado

and Wyoming to identify which factors influenced Athapaskan settlement and how these patterns compare at local and regional scales.

**Coolidge, Frederick (University of Colorado, Colorado Springs)**

[24]

*A Neurobiological Explanation for Spheroids as Embodied Cognition*

Spheroids (i.e., intentionally shaped or gathered round rocks) first appeared about 1.8 million years ago. Sahnouni et al. (1997) proposed that they were by-products from core reduction knapping. Walker (2008) concluded they served as evidence of modern-like behavior in a belief system. Wilson et al. (2016) viewed them as throwing-affordances for killing animals or self-defense. This paper provides a neurobiological basis for spheroids as throwing-affordances and proffers the hypothesis that they may also be examples of embodied cognition (e.g., Malafouris, 2013). Further, spheroids may have been instrumental in learning causality. Pulvermüller (2018) noted that action perception circuits served to coalesce motor and sensory information. Thus, spheroids may have developed as a dynamical throwing-affordance as a function of their perceptual characteristics, i.e., proper size, weight, and shape for throwing. Their instrumentality in learning causality was proposed by Piaget (1954), who thought children learned the link between their own actions and the movement of a ball (spheroid), thus instantiating the concept and consequences of causality. Children may have also perceived their affordant nature as “things that could be rolled”; i.e., prototypical “toys.” Thus, considering spheroids as examples of embodied cognition ties together explanations as diverse as throwing- and rolling-affordances, and toys.

**Coon, Sarah (Purdue University), Erik Otárola-Castillo (Purdue University), Jacob Harris (University of California, Los Angeles) and Curtis Marean (Arizona State University)**

[173]

*Morphometric Comparison of Early Hominin Butchery Evidence to Carnivore Modifications within a Bayesian Framework*

The emergence of stone tool use for butchery by early hominins 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 recognition protocols are subjective. They can lead to conflicting identifications—for example, between cut marks and BSM from carnivores. Canidae species such as *Eucyon wokari* are present in the African Pliocene fossil record when early tool-wielding hominins begin to appear. Canids are known to gnaw on bones and create BSM that analysts may incorrectly identify as the result of human butchery behavior. Consequently, Pliocene canids are candidates for having created BSM currently identified as cut marks. To mitigate this problem, 3D technology and modern geometric morphometrics and Bayesian inference have emerged as analytical tools to differentiate between cut marks and other BSM. Here, we use carnivore modifications on bone, made by wolves (*Canis lupus*) under controlled conditions to compare against experimentally produced butchery BSM. While canid BSM can appear visually similar to butchery marks, Bayesian inference used in this study can differentiate them and provide a level of probability to their distinction.

Coon, Sarah [10] see De la Puente-León, Gabriela

Coon, Sarah [74] see Keevil, Trevor

Cooper, Jago [96] see Martinez Milantchi, Maria Mercedes

**Corcoran-Tadd, Noa (Princeton University), Arturo Rivera Infante, Barbara Carbajal Salazar and Sarah Baitzel (Washington University in St Louis)**

[16]

*Todas las cremas: Shifting Landscapes of Mobility on the Far Southern Coast of Peru (AD 1000–1920)*

Recent field work in Tacna (far southern Peru) by a joint team from Princeton and Washington University in St. Louis has investigated the long-term landscape history of the Sama Valley and its desert margins. Located between the research hotspots of Moquegua and Arica, the Sama Valley has long been overlooked. At the same time, it is well positioned to offer new insights into classic debates about ecology and mobility, ethnicity, and the transforming political economies of the late prehispanic and historic periods. Here we present an initial analysis of recent data on the long-term patterns of connectivity that articulate Sama with wider networks of mobility and exchange. Using a combination of remote sensing and intensive pedestrian survey, the Proyecto Arqueológico del Valle de Sama 2019 field season recorded evidence for multiple routes through the inter-valley desert pampas that border the lower Sama drainage. The results highlight the utility of intensive coverage in apparently marginal inter-valley landscapes and reveal a complex palimpsest of routes and ephemeral sites relating to Cabuza, Gentilar, Inca, and historical periods of use.

Cordell, Ann [125] see Duke, C. Trevor

**Cordero, Robin (PaleoWest)**

[91]

*Winter Garden Hunting along the Rio Grande Flyway: A Case Study in the Procurement of Migratory Birds by Puebloans along the Rio Grande*

Garden hunting is a topic that has received substantial attention in archaeofaunal research over the past 30 years. However, these studies have tended to focus on hunting in active gardens during the growing season, or in fallow fields. Consequently, these past studies have often focused on the procurement of small game (rodents, leporids, and birds) who frequent active and abandoned fields. The goal of this research is to present evidence for a form of garden hunting that has not received as much attention in the literature—garden hunting of fields in the winter. The influx of Pueblo farmers and expansion of farmland along the Rio Grande

floodplain during the late AD 1200s caused a significant northward shift in the overwintering grounds of migratory birds; namely, cranes, geese, and ducks. Previous researchers argued that Puebloan groups hunted these birds for use in ceremonies and for the construction of ritual paraphernalia, and were not consumed. This presentation will first present evidence to evaluate if these winter migratory birds could have been procured for subsistence. This will be followed by a discussion of the broader ramifications of birds and issues of territoriality and identity in the Eastern Pueblo region.

**Cordova, Carlos**

**[172]**

*Moderator*

Cordova, Carlos [30] see Cesaretti, Rudolf

Corl, Kristin [39] see McIntosh, Brandon

Corneli, Katy [133] see Riley, Tim

**Corrales-Ulloa, Francisco (Museo Nacional de Costa Rica) and Yajaira Núñez Cortés**

**[132]**

*It Was Not Always the Frontier: Multicultural Interaction between Isthmo-Colombian and Mesoamerican Peoples in Central Costa Rica*

Evidence for interregional exchange between Central Costa Rica and Greater Nicoya dates back to AD 300, and lasted until the arrival of Europeans in the sixteenth century. Previous scholarship postulates that these regions were located in a changing boundary between Mesoamerican and Isthmo-Colombian peoples. While this may be true after AD 800 with the arrival of Mesoamerican migrants, previous social dynamics may have been of a different nature. Items were moving both ways pre-AD 800, but after AD 800 Greater Nicoya objects are more abundant in the Central Region, while Central Region objects are absent in Greater Nicoya. This is also a time for expanded interregional exchange, the construction of monumental architecture, and peer polity interaction marked by high status goods. Ethnohistorical accounts report a state of warfare, as Huetares from the Central Region and Chorotegas from Greater Nicoya were fearful warriors and enemies. We review the evidence for interregional exchange between both areas through time, and provide new data about the use and movement of exchange objects to evaluate models of interregional interaction. We also explore the volatile situation between regions that alternate economic relations with conflict, in a framework of multicultural interactions.

Corrales-Ulloa, Francisco [178] see Herrera, Roberto

Cortés, Constanza [157] see Martínez-Carrasco, Andrea

**Cortes-Rincon, Marisol (Humboldt State University), Cady Rutherford (University of Texas, San Antonio), Jason Laugesen (Humboldt State University), Michael Mcdermott (Humboldt State University) and Spencer Mitchell (UC Santa Barbara)**

**[152]**

*Lidar: Guided Archaeological Surveys in the Hinterlands of Northwestern Belize*

**[WITHDRAWN]**

Cortes-Rincon, Marisol [22] see Laugesen, Jason

Cortes-Rincon, Marisol [23] see Rutherford, Cady

Costa, Angelica [71] see Fargher, Lane

Costa, Angelica [181] see Marino, Marc

**Costin, Cathy (California State University, Northridge)**

**[106]**

*Discussant*

**Coughlan, Michael (University of Oregon)**

**[165]**

*Discussant*

**Countryman, Jamie (University of Chicago)**

**[131]**

*Feral Fields of the Eastern Adriatic Coast*

On Mediterranean islands and coastal areas of southern Europe, extensive field systems of drystone walls, terraces, and clearance cairns are common landscape features that attest to generations of landscape modification for cultivation. Tracing the precise chronologies of these fields is perennially challenging. While field “architecture” may perdure in the landscape for centuries, the agroecologies and labor practices contained within it changes historically. The living landscape and paleoenvironmental datasets can be mutually informative for understanding complex historical ecologies of agrarian spaces. This paper discusses contemporary in situ observations of abandoned and semi-managed olive groves on a Croatian island (Ugljan, Zadar archipelago) together with new archaeobotanical evidence for the regional intensification of olive-focused arboriculture under Roman colonization in the early first millennium CE. I argue for attention to ferality and feralization as essential historical dynamics of agrarian landscapes. Fields do not necessarily represent clear-cut boundaries between wild or unmanaged spaces and landscapes of domestication and control. Shifting imperial political economies over millennia have periodically reorganized relations between human and plant life in the Adriatic, sometimes prompting abandonment of traditional crops. Yet former fields and former crops may persist in the landscape, taking on new forms of economic value and cultural meaning.

**Covert, Alexandra (Flagstaff Area National Monuments)**

[26]

*From Water to Land: Analysis of Prehistoric Shell at Wupatki Pueblo*

Wupatki Pueblo has a high concentration of prehistoric shell artifacts. Through a literature review, analysis, and spatial analysis, this research project examined the prehistoric shell artifacts from Wupatki Pueblo. This research project determined trade routes of shell to Wupatki Pueblo from the coast of California, Gulf of California, and Gulf of Mexico. Additionally, shell artifacts housed at the Museum of Northern Arizona were analyzed by species and artifact type. Spatial analysis was conducted on the artifact types by placing the artifact types into the North Unit and South Unit of Wupatki Pueblo to determine discernable user patterns. Ultimately this research project gives insight into prehistoric trade networks and the significance of shell objects to the people of Wupatki Pueblo.

**Covey, R. Alan (University of Texas, Austin), Robert Selden Jr. (Stephen F. Austin State University), Nicole Payntar (University of Texas, Austin) and Charles Spencer (American Museum of Natural History)**

[74]

*Geometric Morphometric Analysis of Inca Aribalos from the Bandelier Collection, American Museum of Natural History*

**[WITHDRAWN]**

Cozzo, Emanuele [92] see Fulminante, Francesca

**Crabtree, Pam (New York University) and Taylor Zaneri (University of Amsterdam)**

[129]

*Using Zooarchaeology to Explore the Origins of Medieval Urbanism: Evidence from Badia Pozzeveri near Lucca, Antwerp, and Ipswich*

The origin of urbanism is one of the most significant transitions in human history. Archaeologists and historians have been interested in the origins and development of early medieval urbanism since the days of V. Gordon Childe and Henri Pirenne in the early twentieth century. While most of the early studies of medieval towns were based on historical sources, archaeological research carried out in the late twentieth and twenty-first centuries have provided new data on the process of urbanization in medieval Europe. In this paper, we use zooarchaeological data from Badia Pozzeveri near Lucca in Italy (ca. 900–1300 CE), Antwerp in Belgium (eighth through eleventh centuries CE), and Ipswich in the United Kingdom (seventh through twelfth centuries CE) to address two related questions: (1) how did early urban populations obtain food and other animal products from the surrounding countryside, and (2) to what extent were people living in the countryside participating in urban markets?

**Craig, Jessica (Central New Mexico Community College), Eleanor Harrison-Buck (University of New Hampshire) and Astrid Runggaldier (University of Texas, Austin)**

[80]

*Terminal Classic Ancestors and the Eastern Shrine of Chikin Chi'Ha, Belize*

Investigations of an eastern shrine building in a residential group at Chikin Chi'Ha exposed a complex burial of an adult male and three children under the age of two who were placed near his head and feet. While there is abundant evidence for the construction and use of Classic period eastern shrines in the Maya Lowlands, ceramic analysis from Chikin Chi'Ha suggests this building was modified multiple times and dates primarily to the Terminal Classic–Early Postclassic transition (ca. AD 830–1200). The primary burial interment was in a supine position with legs folded up at the knee—a highly unusual configuration. Both the burial and the eastern shrine dating to the Terminal Classic are somewhat of an anomaly for the Belize River Valley. Evidence for transition, upheaval, and migration has been documented at many Lowland Maya Terminal Classic sites. Here we cross-examine the possibility that this atypical burial and shrine building at Chikin Chi'Ha are the result of an influx of newcomers into this region who introduced new traditions, while also perpetuating “old” Classic Maya narratives concerning an eastern association with ancestor rituals and human sacrifice during this tumultuous time.

**Cramb, Justin (University of Alaska Fairbanks)**

[33]

*The Mystery Dogs of Remote Oceania: An Archaeological and Ethnohistorical View of Domestic Dog Introduction and Loss in the South Pacific*



Domestic dogs comprise one part of the suite of plants and animals transported by voyagers to the islands of Remote Oceania. The distribution of these, and other domesticates, is inconsistent from island to island and from archipelago to archipelago. New archaeological fieldwork, zooarchaeological analysis, and AMS dating demonstrate that settlers introduced dogs to the atolls of Manihiki and Rakahanga in East Polynesia at the time of the first human arrivals ca. AD 1290–1390 and maintained them until after European contact in AD 1606. Dogs died out on the atolls prior to missionization in AD 1849. Archaeological reports and ethnohistoric text analyzed for 35 islands / island groups in Remote Oceania reveal regional patterns of introduction and loss. The findings indicate that voyaging peoples introduced dogs to the majority of the island groups in Remote Oceania before European contact, and that rates of pre-European localized extinction were high. The highest rates of loss occur on low-coral islands suggesting that low-island vulnerabilities and spatial constraints on population size may affect dog survivorship. This analysis suggests that the dogs of Remote Oceania have a complex history in which introduction to new islands was common, but long-term survival was difficult.

[33]

Chair

Crass, Barbara [21] see Holt, Evan

**Crawford, Dawn (Southern Methodist University), Michael Callaghan (University of Central Florida), Daniel Pierce (Université Bordeaux-Montaigne, France), William Gilstrap (Massachusetts Institute of Technology) and Brigitte Kovacevich (University of Central Florida)**

[171]

*Ceramic Production during the Terminal Classic at Holtun, Guatemala*

The use of provenance studies to answer anthropological questions related to the production and access of ceramics is well documented for the Maya region. Mineralogical and chemical compositional analyses are often used to identify the material origins, or provenance, of ceramics. In this paper, the authors report on Neutron Activation Analysis (INAA) and ceramic petrography of serving and utilitarian vessels recovered from Terminal Classic period elite and non-elite domestic contexts at the Maya site of Holtun, Guatemala. The research is part of Crawford's dissertation research, which examines economic resilience expressed through non-elite choices related to production during the Terminal Classic at Holtun. Preliminary INAA results show that Terminal Classic potters were using chemically distinct clays exhibiting different paste fabrics than previously studied Preclassic pottery at Holtun. In addition, chemical composition during the Terminal Classic period does not appear to match other sites in the Maya lowlands. However, petrographic data show that Terminal Classic potters continued to use local carbonate materials for pottery production. This is part of a long-lasting local tradition of potter manufacture that can be traced back to the Middle Preclassic period. The authors will present preliminary data and discuss its implications in light of resilience theory.

**Crawford, Trinity (Arizona State University), Anne Sherfield (Arizona State University) and Michael Smith (Arizona State University)**

[30]

*Standardization of Apartment Compounds at Teotihuacan, Mexico*

How standardized were the apartment compounds at Teotihuacan? Some archaeologists have claimed they were highly standardized in size and form, while others have claimed they are all different. How can this question be answered rigorously? We investigate indications of standardization in the apartment compounds of Teotihuacan, Mexico using a geo-referenced subset of the excavated compounds. Traditional analysis of architectural standardization focuses on similarities in the configuration of space either as modular units or syntactic patterns. Here, we examine similarities in the spatial proportions of rooms by measuring the coefficient of variation for a selection of spatial attributes including room size, distance of rooms from patios, and width of both outer and inner walls. We will determine which, if any, spatial attributes are being standardized and contribute to the discussion of labor organization, central planning, and social structure at Teotihuacan.

**Creamer, Petra (University of Pennsylvania)**

[168]

*Death and Taxes in the Ancient Assyrian Empire: Pictures of Wealth Inequality in Provincial Settlements*

The study of mortuary material in archaeology has always related to subjects of identity, beliefs, and resources. Furthermore, it is one of our prime resources for understanding non-elite individuals in the premodern world, especially in societies where historical sources revolve around the ruling elites. This is certainly the case in the ancient Assyrian Empire (ca. 1400–600 BCE). But in this particular instance, mortuary practices not only serve to help us in understanding non-elite existence, but the interaction between non-elites and elites.

To illustrate this, I look at the depletion of wealth in grave contexts in the Assyrian core and periphery over the 700 years of existence of the empire. I argue that a widespread decrease in grave goods and grave good quality signal the increase of resource extraction over time. As the Empire expanded and strengthened, wealth was extracted from the provinces in amounts unequal to those in the core of the Empire. This increase in taxation, paired with the adoption of Assyria mortuary characteristics in the periphery, illustrate the extent to which Assyrian imperialism was imposed upon their non-elite subjects.

Creese, John [105] see Walder, Heather

Crespi, Mattia [167] see Hunter Burkett, Meisha

**Crider, Destiny (Luther College), Daniel Pierce (Missouri University Research Reactor), J. Heath Anderson (University of Minnesota Mankato) and Michael Glascock (Missouri University Research Reactor)**

**[30]**

*Revisiting Tula, Hidalgo Epiclassic Ceramics: Progress and Recent NAA Results*

Significant progress has been made in the description and definition of typological and compositional assemblages of Tula, Hidalgo regional ceramics during the Epiclassic period of the Central Highlands. Neutron Activation Analysis conducted at the Archaeometry Laboratory and the Research Reactor Center at the University of Missouri (MURR) now includes contributions from multiple researchers. We report the findings from the 119 Epiclassic ceramic samples submitted to MURR from Anderson's Proyecto Cerro Magoni, a large Epiclassic settlement and ceremonial center located on a hilltop within the view shed of Tula Chico. The ceramic types selected reflect a diversity of well-known styles found throughout the Central Highlands and a handful of types not common to the Basin of Mexico, but are increasingly recognized for relationships northwest toward the Bajío. Emergent compositional groups from this dataset will be discussed in relation to previous compositional sampling of the Tula and Basin of Mexico studies by Crider and others. We will provide discussion on how these results provide new evidence and inform our interpretive frameworks on questions on ceramic production and exchange in the region, and highlight key domains for further study both within Hidalgo and in relation to neighboring areas in the highlands.

**Crimmel, Thomas and Yimeng Yan (UCSB MesoAmerican Research Center)**

**[22]**

*Mapping Seasonally Inundated Wetlands within the Ancient Maya Center of El Pilar*

The ancient Maya center of El Pilar is a mid-sized settlement nestled on the ecotone dividing the central Petén and Belize river valley. With nearly half of the site consisting of seasonally inundated wetlands, defining the extent and nature of these areas is essential before interpreting El Pilar's settlement patterns. Remotely sensed lidar and high-resolution satellite imagery can be used to describe the site's topography, vegetation, and recent disturbances. Using this information to interpret the landscape, seasonally inundated wetlands can be delineated and described. These data, along with site scale settlement and soils data, are essential in describing how the ancient Maya of El Pilar managed the landscape to meet their needs.

Crimmel, Thomas [71] see Tran, Justin

Cristwell, Victoria [184] see Boyd, Charles

Crites, Daryl [26] see MacMillan, Vincent

**Cromartie, Amy, Chéïma Barhoumi (Institut des Sciences de l'Evolution de Montpellier), Guillemette Ménot (LGL-TPE, ENS de Lyon), Erwan Messager (EDYTEM) and Sébastien Joannin (Institut des Sciences de l'Evolution de Montpellier)**

**[78]**

*Wildfires and Human Communities in Bronze and Iron Age, Armenia: A Macro-Charcoal and Paleo-Temperature (brGDGT) Reconstruction*

Humans today and in the past have to contend with the impacts of wildland fires. In grasslands, these fires occur frequently at annual to decadal scale. In the Kasakh valley, Armenia, recent research has revealed periods of increased fire activity during the Early Bronze and Late Iron Age and decreased activity in the Middle and Late Bronze Age (Cromartie et al. 2020). While large conflagrations during the Early and Late Bronze Age have been recorded on-site (Badalyan et al. 2008). The causal relationship between these fires has yet to be examined. In this paper we build on this previous research to investigate the scale of these landscape fire events in relation to temperature and cultural change. We utilize macro-charcoal from sediment cores for fire reconstruction, the paleo-thermometer biomarker brGDGTs to reconstruct temperature, and burn events recorded in the archaeological record to examine the complex relationship between on-site and off-site burns while assessing the impacts of future climate change. Preliminary results suggest that climate driven wildfires were common during the EBA and may have impacted human settlements while onsite conflagrations during the LBA appear to be limited to the archaeological site. In the LIA settlements may have escaped large wildfire events.

**Crow, Madison (University of Nevada, Reno)**

**[70]**

*Fetal Burials at San Giuliano*

The burial of unbaptized fetuses at San Giuliano exposes friction between the institutional church and medieval Italy's laity. The church's theology of Original Sin, baptism, and salvation left young children especially vulnerable to dying unbaptized and being denied a Christian burial in consecrated grounds. Texts reveal that in addition to utilizing the accepted, orthodox measures of appealing for divine help, Italian laypeople turned to folk religion and occasionally violated canon law when struggling or deceased fetuses and infants were in danger of being buried in unhallowed ground. Fetal and infant burials found at other medieval Italian sites confirm that parental concern often clashed with ecclesiastical burial regulations. The remains of unbaptized children have been discovered in consecrated ground in religiously symbolic placements. Ultimately, the textual and archaeological records of fetal and infant burial in medieval Italy serves as a material legacy for how laypeople interpreted and reacted to the church's theology and regulation of baptism and burial.

Crowley, Brooke [72] see Hixon, Sean

**Crowley-Champoux, Erin (University of Minnesota)****[129]***Reconstructing Animal Economies of Early Ireland in Transition*

In Ireland, one of the defining features of the transition from the Iron Age to the Early Medieval period, during the first centuries AD, is the development of a dairying economy. The concern for dairy as a commodity had social and political consequences for Early Medieval society; with status reflected in quantities of dairy cattle and social obligations of hospitality expressed in butter and cheese. The development of this system, however, is not well understood. This paper presents the initial findings from zooarchaeological analysis of the animal remains from Ninch, Co. Meath. Excavation at this site demonstrated a long sequence of occupation from the Late Iron Age through the Early Medieval period, examining the transition from the prehistoric to the medieval. At times the site was primarily a settlement and, at others, a site inflected by ritual expression and burial. This demonstrates not only change over time but also the use of animals in various social contexts. By examining this period of social and political transformation, I question narratives of continuity and change as well as the staid interpretations of resource exploitation and economic development during this period.

**Crown, Patricia (University of New Mexico) and Patrick Lyons (Arizona State Museum)****[91]***Macaws and Parrots of the Arizona Mountains*

One of the highest concentrations of macaws and parrots in the US Southwest was recovered from four sites in the mountains of east-central Arizona: Grasshopper, Kinishba, Point of Pines, and Turkey Creek Pueblos. This study reexamines the evidence for acquisition, care, and discard of the birds between about AD 1250 and 1400. It provides updated numbers and contextual information based on examination of the original field notes and discovery of previously undocumented avifauna. Given the strong evidence for diverse cultural groups living within the four large pueblos, these assemblages offer an unusual opportunity to examine how beliefs regarding appropriate disposal practices created intrasite and intersite patterns.

Cruz, Gilberto [181] see McCormick, David

**Cruz Jimenez, Ricardo Leonel, Jose Luis Ruvalcaba Sil (Instituto de Física, UNAM), Edgar Casanova González (Instituto de Física, UNAM), Mayra Manrique-Ortega (Instituto de Física, UNAM) and Luis Barba (Instituto de Investigaciones Antropológicas, UNAM)****[177]**

*Aspectos de aprovisionamiento y uso de la obsidiana en Chicoloapan Viejo, un asentamiento Epiclásico en la Cuenca de México*  
En el marco del "Proyecto arqueológico Chicoloapan viejo" de la Universidad de Wisconsin-Madison, se discuten aspectos de vida comunitaria y regional en el sitio de Chicoloapan Viejo durante su ocupación epiclásica (550–850 ec). A partir del estudio morfo-tecnológico de la obsidiana y del análisis de procedencia mediante la técnica de Fluorescencia de rayos X de una muestra representativa, se propone un panorama general referente a las actividades domésticas y modos de vida comunitarios expuestos desde el uso de la obsidiana; además se exponen planteamientos preliminares respecto al aprovisionamiento y acopio de este material tanto en este sitio, como en la Cuenca de México desde los inicios del período Epiclásico; de esta manera se busca incrementar los conocimientos con los que contamos, respecto a subsistencia doméstica y corporativa del asentamiento.

Cruz Jimenez, Ricardo Leonel [177] see Barba, Luis

**Cuello del Pozo, Paloma (Texas A&M University), Eduardo Eche Vega (Universidad Nacional de Trujillo) and José Peña (University of Arizona)****[182]***Pollen Analysis at El Campanario (Peru): Preliminary Study from a Public Architecture*

The present research analyzed pollen samples recovered from public architecture at the site of El Campanario in Huarmey Valley (Peru). This exploration focuses on issues regarding archaeological palynology by presenting a case study with a preliminary set of samples in an attempt to open a line of research at El Campanario. The adobe platform, where the majority of the samples were obtained, was built by the Casma polity during the Late Intermediate period (AD 1000–1400). Previous macrobotanical analysis conducted at the platform suggests that public activities such as feasting were conducted at the site in order to reinforce social relations among various social groups located in the Huarmey Valley. We propose the potential of applying palynological methods in order to capture more information in regard to occupation, landscape use, and subsistence strategies. Given the reduced number of samples, we only discuss presence and/or absence of pollen families at the site. Mainly, our aim is to explore methodological approaches such as those published by Bryant and Hall (1993), and use our preliminary data to exemplify what are the inconveniences of analyzing fossil pollen.

Cuello del Pozo, Paloma [14] see Ritter, Alexandra

**Culleton, Brendan****[164]***Discussant*

**Curet, L. Antonio (National Museum of the American Indian, Smithsonian Institution)****[116]***Death, Remembrance, and Cultural Change at the Ceremonial Center of Tibes, Puerto Rico*

For a long time, the Ceremonial Center of Tibes has been considered by many of us as evidence of incipient social stratification and monopolization of power in the Caribbean. However, a long-term project at this site has failed to find clear evidence of strong social differentiation and has forced us to begin explaining either the presence of social stratification without archaeological correlates or the development of a monumental, ceremonial center without social stratification. This paper takes a closer look at the premises and evidence (or lack of evidence) recovered by the project and propose a new perspective that may explain the contradictions presented above.

**Cusicanqui, Solsiré (Harvard University), Bryan Velazco (Universidad Nacional Mayor de San Marcos) and Ricardo Alburquerque (Universidad Nacional Mayor de San Marcos)****[69]***Identity through Movement: Domestic Political Units and Pan-Andean Relations in Early and Middle Cajamarca Periods (50 BC–AD 750)*

The purpose of this project is to investigate the relationship between environmental factors and cultural dynamics as manifested in the development of specialized pottery production as a symbol of an ethnic identity in the valley of Cajamarca, Peru, during the Early and Middle Cajamarca periods (cal 100 BC–AD 750). To that end, this work will examine the idea of ethnicity and communities of practice in the Andes. First, we propose how ethnicity is generated and maintained, emphasizing certain cultural features (e.g., pottery, architectural patterns, goods, mobility, funerary practices). Second, we will evaluate how this ethnic identity is a product of belonging to a community that is built through the participation of its members in the practices and activities of this society. We will cover the internal and external dynamics of this sociocultural group, focusing on cultural remains and their distribution in different functional spaces registered to date. Our work is based on the excavations of two archaeological sites of the Cajamarca period: Iscocongá and Carambayoc. We will present the results of three field seasons in both archaeological sites that present pottery production areas, houses, ceremonial, and, possibly, administrative spaces.

**[69]***Chair*

d'Errico, Francesco [141] see Doyon, Luc

Dagtas, Nihan [174] see Wright, Sterling

Dalmás, Daniel [72] see Somerville, Andrew

d'Alpoim Guedes, Jade [182] see Garvin, Arianna

**Dalton, Jordan****[157]***Chincha-Inka Joint Rule: Exploring the Role of Local Elites in the Transformations of Complex N1 at Las Huacas*

Studies of Inka expansion often highlight the important role that elites played in expanding and administering the empire. This is especially true on the central and south coast, where the Inka came into contact with complex polities. Arguably, the most well-known of these groups were the Chincha. Through ethnohistoric and archaeological investigations it is clear that the authority of the Chincha and the Inka were developed alongside each other, but how this system of dual authority was developed and the active and passive roles of local elites has yet to be fully explored. This paper presents new data from the site of Las Huacas, which was an important agricultural center in the Chincha Valley during the LIP (AD 1100–1400) and Late Horizon (AD 1400–1532). Research at the site discovered transformations to the use and organization of Complex N1 throughout the Late Horizon and, possibly, early colonial period (AD 1532–1650). These changes, while incorporating new architectural canons and some foreign material culture, have a strong local influence. The paper concludes by exploring how these transformations reflect the role of local elites and their participation in the changing sociopolitical landscape of the Late Horizon.

Dalton, Jordan [128] see Gómez, Juliana

Dalton, Jordan [128] see Larios, Jennifer

Dalton, Kevin [38] see DeGeorgey, Alex

**Dalton, Sara (Proyecto Cuenca Mirador)****[48]***At the Gates of Xibalba: The Chultunob of El Mirador, Guatemala*

Subterranean chambers known as chultuns, or *chultunob*, exist in great numbers in sites throughout the Maya world, with over 300 being found in the city site of El Mirador alone. Although seemingly ubiquitous, the function of these structures has yet to be fully understood, with a variety of uses having been proposed over the last 130 years. Within the Mirador Basin a number of these structures have been excavated, with an assortment being selected from both elite and residential areas. This paper presents the

latest findings in the ongoing excavation and analysis of the chultunob of the Mirador Basin with an additional focus on multiple burials found in one elite Preclassic chultun and discusses possible alternative uses for these underground structures and their changes in use over time.

D'Altroy, Terence [118] see Murray, Brendon

Damick, Alison [145] see Fowles, Severin

### **Damp, Jonathan**

**[149]**

*Castellated Rims and Silica Bodies: Rethinking Valdivia*

Initial attempts to explain the origins of pottery on the coast of Ecuador and in the rest of the Americas focused on transpacific contact. During the last few decades this debate has quieted as the Vegas and Valdivia phases of southwest Ecuador became better known. Nevertheless, there has remained a chronological hiatus between the two phases. Demographic and settlement data is combined with geoarchaeological interpretations of the mid-Holocene record to demonstrate how simple demographic growth combined with geomorphological changes of the coastal landscape yielded changes in settlement patterns, growth of settlements, and a transition in social production that led to the production of pottery and the creation of early villages.

**[149]**

*Chair*

D'Andrea, Catherine [94] see Woldekiros, Helina

### **Daneels, Annick (IIA-UNAM Mexico)**

**[122]**

*Flayer and Flayed Figures in Central Veracruz, Mexico: Is It Xipe?*

The god Xipe Totec has been mostly analyzed from Postclassic evidence (Toltec and Aztec). He is recognized by the representations of a person wearing the skin of a flayed victim or the victim himself. While both types of figures appear in several regions of Mesoamerica, their contexts vary. In this paper I will review Classic and Postclassic period figures from Central Veracruz. I will show that the skin-wearing figure is quite old and common, and that flaying marks will appear on both on male and female skeletons having a particular head deformation, suggesting a ritual practice that is not identical to what we know from historical sources. On the other hand, the flayed victim figure is scarce, apparently Early Postclassic, and probably introduced, together with other deity representations, from the central Mexican Highlands. On the other hand, Late Postclassic Aztec depictions of Xipe closely match the Central Veracruz skin-wearer imagery (more than the Zapotec and Teotihuacan ones), suggesting a rejection of the Toltec model and a recuperation of an earlier representation, emphasizing the flayer and not the flayed.

Daneels, Annick [133] see Kita, Yuko

Daneels, Annick [181] see Piña Martínez, Aarón David

### **Darby, Melissa (Portland State University)**

**[153]**

*Zelia Nuttall and Drake's Dream*

In 1886 Zelia Nuttall began work at the Peabody Museum for Ethnology and Archaeology under the tutelage of Frederic Putnam. Nuttall became a specialist in precolumbian Mesoamerican cultures and conducted archaeological fieldwork in Mexico for the Peabody, where she was "Honorary Assistant in Mexican Archaeology," an unpaid post that she held for 47 years. She lectured at major conferences and universities in the Americas and Europe and wrote articles for prestigious journals. She traveled throughout the world to collect archaeological and ethnological specimens for museum collections, as well as for a select group of wealthy patrons including Phoebe Hearst. With Hearst's assistance, she was one of the founding members of the Department of Anthropology at UC Berkeley, where in the early years of the department she was a field director of archaeological research in Mexico. Her major contributions to the field of anthropology are classics: *The Nuttall Codex*, *The Island of Sacrificios*, and the *Fundamental Principles of Old and New World Civilizations*. Her findings on the location of Francis Drake's fair bay on the West Coast were eclipsed by Drake's Plate of Brass land claim, a hoax that was likely created by a famous history professor, her nemesis.

### **Dashzeveg, Bukhchuluun (Yale University), Lisa Janz (Trent University), Odsuren Davaakhuu (Mongolian Academy of Sciences) and Asa Cameron (Yale University)**

**[93]**

*Use and Reuse of Burial Space during the Late Bronze Age and Early Iron Age in Mongolia: A Case Study from Zaraa Uul*

During the late second millennium BC, communities in the Gobi-steppe of Mongolia began to build unique burial structures made of stone. The Late Bronze Age builders of these mortuary features employed new forms of surface demarcation and for the first time in this region, individuals were interred in a prone position. At the turn of the millennium, this prone tradition was replaced by subsequent "Slab Burial" mortuary culture. In recent years, archaeologists working in Mongolia have increasingly focused on this transition to the Early Iron Age because this period is crucial in the development of social and political complexity, horseback riding, and long-distance trade and exchange. This paper presents the results of recent excavations at Zara Uul in eastern Mongolia. The

data generated from this project sheds new light on the transition of two periods through the documentation of the use and reuse of burial space during the Early Iron Age.

Dashzeveg, Bukhchuluun [93] see Cameron, Asa

Daura, Joan [174] see Sanz Borràs, Montserrat

Davaakhuu, Odsuren [93] see Dashzeveg, Bukhchuluun

### **Davenport, James (University of New Mexico)**

**[16]**

#### *Thin Section Petrography of Inka Pottery from Pachacamac, Peru*

This study investigates the organization of production for Inka pottery at Pachacamac from several contexts throughout the site's ceremonial core and elite residential sector. Pachacamac was a major Ychsma center on Peru's central coast that was transformed into a major Inka provincial center around 1470 CE. The Inka constructed a number of buildings and spaces at Pachacamac and Inka pottery is prevalent in many contexts. Inka polychrome (a style that originates in the Inka capital of Cuzco but is found widely throughout the empire), blackware (which combines elements of Inka pottery with those of the Chimú empire from the north coast), and other regional styles of Inka pottery, along with local Ychsma pottery, are analyzed. Results indicate multiple fabrics used in producing Inka pottery that was used at Pachacamac. Some of these fabrics match those used to produce local Ychsma pottery. Multiple decorative styles of Inka pottery also are found using the same fabric. Data from thin section petrography are combined with data collected using neutron activation analysis as well as other metric and stylistic attributes of pottery to reconstruct the organization of production.

### **Davidson, Jaron**

**[117]**

#### *Long-Distance Interaction in Viejo Period Casas Grandes*

This research addresses how interregional interaction changed between the Viejo period (AD 700–1200) and Medio period (AD 1200–1450) in northwest Chihuahua, Mexico. Nonlocally procured or created artifacts, features, and iconographic elements are used as proxy evidence for past long-distance relationships. Data available in technical reports and other publications concerning these materials in Viejo period contexts and a sample of excavated Medio period sites are synthesized and presented. The data are used to create a geospatial dataset and distribution maps with quantities and contextual information for each of the nonlocal materials. I argue that interaction and social networks with long-distance neighbors were complex and widespread during both the Viejo and Medio periods. These intricate relationships morphed and altered in profound ways with the rise of the regional center Paquimé and the florescence of the Casas Grandes cultural tradition, but some of the fundamental relationships also remained the same.

Davidson, Matthew [130] see Ritchison, Brandon

### **Davies, Benjamin (University of Utah) and Matthew Douglass (University of Nebraska)**

**[58]**

#### *Resilience and the Record: Suggestions for Application of Resilience Concepts to Archaeological Cases*

Concepts from resilience theory (RT) have been variously applied in studies of the deep human past. Given emphasis on cross-scale interactions and cyclical trajectories, RT provides a framework to interpret historical sequences in terms of general ecological processes. However, less consideration has been given to the interface between the trajectories of socioecological systems prescribed by RT and the processes that give rise to patterning in the archaeological record. Beyond the issue of preservation, patterning in the record may reflect systemic elements that are reinforced by shifts in adaptive responses, or elements that periodically change to maintain a dynamic equilibrium. To interpret archaeological residues in terms of resilience, their formation must be understood within the context of adaptability; that is, the capacity of actors to influence resilience. Here, we consider different pathways to archaeological patterning through mechanisms that contribute to resilience. Explicit models, such as computer simulations, provide a key tool for exploring how patterns form as outcomes of adaptive processes. We show that while the translation of RT concepts to the past is not always straightforward, models integrated with formation dynamics can be used to inform on potential generating mechanisms, providing expectations for future lab and fieldwork.

### **Davila, Carol (University of California, Berkeley), Ivan Rivera (INAH) and Jennifer Saumur (Université Paris 1 Panthéon-Sorbonne)**

**[155]**

#### *I'ya Xhína Santuario de la lluvia en San Juan Luvina, Sierra Norte, Oaxaca, Mexico*

The paper is dedicated to the presentation of the archaeological site of I'ya Xhína, the "Nose Mountain," in the Zapotec Sierra Norte of Oaxaca, in Mexico. The site reveals a consecration to the worship of water and rain with a ritual pond at the summit of the mountain as well as an unknown Sierra Norte Zapotec's version of the deity Quetzalcoatl named Bel'la Inda, the "Water Serpent." Moreover, it seems that I'ya Xhína was occupied in an unusual chronological period, during the transition between the Classic and Postclassic periods. Finally, these finds allow us to extend the geographical limits of the tradition of Zapotec writing monuments since there was no previous known record of such writing in this area of Oaxaca. Concerning the research methodology, this

investigation was realized with a strong focus on inhabitants' participation in interpreting the sacred places and the relationship between the community of Luvina and its environment. Furthermore, the focus on memory and meaning has shown promising results concerning its correlations with archaeological prospection and iconographical analysis. I'ya Xhina shows us how intangible heritage is relevant for studying tangible heritage and thus how sacred places unify archaeology and indigenous communities' memory.

Dávila, Cristian [157] see Martínez-Carrasco, Andrea

**Davis, Caitlin (Yale University)**

[96]

*Formative Ceramic and Obsidian Transitions at Salinas La Blanca*

Salinas La Blanca, located within the coastal estuary of the Soconusco region of Guatemala, was occupied from the Early to Middle Formative periods. This was a period of considerable cultural change, as Olmec influence on the Pacific Coast waned and regional centers developed more centralized power. This paper presents the results of a chemical compositional approach to ceramic and obsidian artifacts using portable x-ray fluorescence (pXRF). Obsidian analysis indicates that Salinas La Blanca participated in an extensive trading network, receiving obsidian from multiple sources of a considerable distance. Chemical characterization of ceramic pastes provides an opportunity to reevaluate existing ceramic ware classifications, such as the relationship between Guamuchal Brushed and Suchiate Brushed *tecوماتes*, and reflect on the benefits and challenges which accompany the use of pXRF in analyzing ceramic artifacts. The interregional and local ties demonstrated through the ceramic and lithic assemblages place Salinas La Blanca within a complex network of economic and social relations and parallels evidence of emerging social complexity at contemporary regional centers in Formative Pacific Coastal Guatemala.

Davis, John [39] see Hackenberger, Steven

**Davis, Kaitlyn (University of Colorado, Boulder)**

[47]

*Pueblo Agricultural Adaptations to Socioeconomic Changes in New Mexico*

This presentation illustrates the results of the survey work of the agricultural areas around two precontact villages (Poshuouinge and Pueblo Blanco) and two contact-era villages (Cuyamungue and San Marcos). One hundred and fifty-six agricultural features were documented on the survey and ranged from Pueblo irrigation ditches in and slightly above the floodplain to raised gravel mulch fields on upland ridges above the villages. Analyzing the changes in the location, type, size, and density of these features before and following contact enable a better understanding of Pueblo agricultural adaptations over time and the extent to which Spanish plants, animals, and agricultural methods were incorporated into Pueblo agriculture. This survey work is part of a larger project investigating how (and to what extent) Pueblo people in the Rio Grande region of New Mexico adjusted their agricultural practices when confronted with Spanish colonization. The project consists of (1) developing agricultural potential models to identify where the optimal growing areas likely were, (2) surveying the areas around multiple precontact and contact-era Pueblos to document agricultural features and any changes in those features or technologies with colonization, and (3) analyzing sediment samples to determine the types and density of plants grown in the fields.

Davis, Loren [98] see Dixon, E. James

**Davis, Mary, Lucas Martindale Johnson (Far Western Anthropological Research Group Inc.), Elsa Carpenter (Far Western Anthropological Research Group Inc.), Lee Drake (Decision Tree, LLC) and Daron Duke (Far Western Anthropological Research Group Inc.)**

[7]

*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 define the size threshold for acceptable precision and accuracy and to test the use of a source library that includes small samples. Using traditional flintknapping methods, 1,200 flakes were made from three geochemical obsidian sources: Casa Diablo, Bodie Hills, and Buffalo Hills. Specimens ranged from very small pressure flakes to large interior flakes and were intended to replicate the size and morphological variation typical of an archaeological assemblage. The specimens were analyzed on two Bruker handheld pXRF units, the Tracer III-SD and the 5i. Statistical analyses and computing algorithms were used to quantify the size limits of nondestructive analysis and to create source confidence regions that include small samples.

Davis, Steve [140] see Snow, Susan

**de Carteret, Alyce (LACMA) and Diana Magaloni Kerpel (LACMA)**

[180]

*The Polychromatic Painting Strategies of Classic Maya Ceramic Artists*

Maya polychrome ceramics have long been regarded for the distinctive regional styles that emerged during the Late Classic period (ca. 600–900 CE). These styles, aligned with royal workshops and their patrons, encompass a wide range of aesthetic strategies,

particularly with respect to color. Some workshops and their artists developed a broad palette of colors to adorn their vessels, painting colorful scenes imbued with realism. Others prized line over color, painting whiplash strokes to render evocative if colorless tableaux. Others used bichromy, manipulating a single paint in variable concentrations to create remarkable depth and movement over a static base. How did Classic Maya ceramic artists formulate and apply their ceramic paints, or engobes, and what does the development and selection of particular paints convey about the artistic process? What meaning do these different strategies impart on a vessel and its imagery? In this paper, we examine the innovative science and materiality of Classic Maya ceramic paints, or engobes, as they intersected with art and society.

**De La Fuente, Guillermo (Universidad Nacional de Catamarca / CITCa, CONICET) and Sergio Vera**

[125]

*Pottery-Making Practices and Technological Choices during the Early Period (ca. 200 BC–AD 600) at the Southern Sector of Abaucán Valley (Dept. Tinogasta, Province of Catamarca, Argentina): A View from Ceramic Petrography*

The southern sector of the Abaucán Valley presents an important prehispanic occupation belonging to the Early Formative period (ca. 200 BC–AD 600). The main material evidence of this occupation is given by the presence of small household units characterized by a quadrangular settlement pattern associated with agricultural infrastructure, mainly large cultivation *canchones*, simple and multiple grinding stones, together with a typical gray polished pottery, named Saujil, distributed along the residence compounds as well as in the cultivation areas. Saujil pottery is mainly characterized by a reduced firing atmosphere and several ceramic forms such as bowls, jars, globular ollas, small ollitas, and infant funerary urns. In this paper, we present a technological characterization of ceramic pastes through ceramic petrography together with a morphological analysis of the main Saujil ceramic forms from La Florida archaeological site, Department of Tinogasta, Province of Catamarca, Argentina. Technological analyses were carried out at two different levels, and ceramic petrography was performed using image analysis software in a representative sample of sherds. Additionally, a cross-cultural comparison with other nearby geographical areas for this chronological period is given.

**de la Peña, Paloma (McDonald Institute for Archaeological Research & Evolutionary Studies Institute) and David Witelson**

[151]

*Introducing "Project Piedemonte": Between the Maloti-Drakensberg and the Great Escarpment in the Eastern Cape Province, South Africa*

This new project aims to map mobility patterns and social networks from prehistory to historical times in the western piedmont of the Maloti-Drakensberg, South Africa. It also considers the relationships between archaeological and rock art sites, and how rock art relates to seasonal or transhumance patterns in the region. Investigation of the piedmont in this part of southern Africa offers the opportunity to explore three important topics. The first is the use of landscape: the piedmont is situated in the grassland biome that has seen little research into its Middle Stone Age levels. The second is Later Stone Age seasonal mobility and landscape exploitation. The third topic is the detailed investigation of social interactions, occupations, and continuity and change over time. Depositional sequences in the piedmont are rich and encompass the Middle Stone Age, the Later Stone Age, contact between Later Stone Age hunter-gatherers and precolonial livestock-keeping communities, and the colonial and historical periods. This presentation will introduce the project aims and objectives, share some preliminary results from two prospection surveys, research conducted on the rock art, and a "catch and release" study of some of the Stone Age archaeology.

de la Peña, Paloma [151] see Val, Aurore

**De la Puente-León, Gabriela (Pontifical Catholic University of Peru), Sarah Coon (Purdue University), Francesca Fernandini (Pontifical Catholic University of Peru) and Erik Otárola-Castillo (Purdue University)**

[10]

*Modeling Early Human Migration Patterns in South America: A Preliminary Spatial Analysis on the Peruvian Coastline Using Machine Learning and Bayesian Statistics*

The first South Americans' coastal migration routes remain a central question to studying the settlement patterns of human colonization worldwide. However, these early migrations likely occurred along a coastline that today is mostly submerged. Consequently, in countries like Peru, there is currently a shortage of coastal archaeological sites that date to this time. This study presents a preliminary spatial analysis focused on evidence for the early human migration patterns along the Peruvian coastline. The main objective of this research is to increase knowledge on the probability of finding early archaeological remains in this area of the Andes, especially in the Cañete region, located on the central coast of Peru. To achieve this objective, we conducted three primary activities: (1) archival research of Peruvian archaeological literature detailing previous surveys and excavations of early archaeological sites on the coast, (2) generated a database of locations and descriptions of these sites, and (3) designed models to predict new site locations using machine learning and Bayesian statistical techniques in the R programming environment. Results of cross-validation tests show that models make successful predictions of known sites using independent datasets. Pedestrian surveys will verify new potential site locations once field activity can resume safely.

**De La Torre-Salas, Natalie (University College London)**

[68]

*Heritage Organizations and Post-Hurricane Public Engagement: Knowledge Management and Lessons Learned from Hurricane Maria in Puerto Rico*

People, governments, and societies have repeatedly throughout history had to respond to the effect of hurricanes on their communities and environments. Although places like the Caribbean have a long history of being impacted by natural disasters; hurricanes are seldom studied in the context of heritage management and community adaptation strategies in regard to disasters and resilience. This paper uses Hurricane Maria's impact in Puerto Rico as a case study to explore the role of heritage professionals



during the post-disaster recovery phase by exploring their actions for re-engaging with local communities. It further evaluates lessons learned from both parties that can be used to develop community-based disaster risk management strategies. The study shows the importance of heritage professionals in utilizing post-hurricane public engagement efforts to re-establish a sense of normalcy. Ultimately, it highlights the significance of identifying community leaders and building partnerships to effectively carry out participatory approaches to disaster risk management and increasing resilience of communities and cultural resources to hurricanes.

de Leon, Monica [152] see Vepretskii, Sergei

**de Lombera-Hermida, Arturo (Universidade de Santiago de Compostela), Geoffrey Clark (Arizona State University), Xosé Pedro Rodríguez-Álvarez (Institut Català de Paleoeologia Humana i Evolució Social) and Ramón Fábregas Valcarce (Universidade de Santiago de Compostela)**

**[140]**

*Dealing with "Second-Rated" Raw Materials: The Management of Quartz and Quartzite by the Westernmost Cantabrian Upper Paleolithic Groups*

Northwest Iberia is a Paleozoic territory almost void of flint outcrops. The arrival of Cantabrian Upper Paleolithic groups, used to flintknapping, to a new lithological region implied a reorganization of their technological basis. The analysis of four lithic assemblages, ranging from the Aurignacian to the Final Magdalenian/Azilian, allows us to understand the role of the lithological constraints and the technological strategies developed during the Upper Pleistocene. Changes in raw material acquisition, spatial fragmentation of *chaînes opératoires* and new technical choices are examined in those records aiming at overcome the presumed raw material constraints.

de Lombera-Hermida, Arturo [53] see Fábregas Valcarce, Ramón

**De Lucia, Kristin (Colgate University) and Linda Scott Cummings (PaleoResearch Institute)**

**[155]**

*Residue Analysis of Cooking Vessels from Early Postclassic Xaltocan, Mexico*

We examine the use of cooking vessels from Early Postclassic (AD 900–1250) Xaltocan, Mexico, through residue analysis of ceramic sherds. The analysis combined phytolith, pollen, and starch analyses with Fourier transform infrared spectroscopy (FTIR) and energy dispersive X-ray fluorescence (ED-XRF) conducted at the PaleoResearch Institute. Because our understanding of prehispanic foodways in central Mexico is based largely on sources that describe or depict Aztec practices in the sixteenth century, we ask how foods were similar or different prior to the Aztecs. Further, we also seek to gain a better understanding of how plainware vessels were used in prehispanic times. We find that while there is long-term continuity in the preparation of foods such as tamales and corn gruels, additional foods such as tuber-based stews were also prepared in the Early Postclassic. This study also finds that some ceramic vessels, such as comales and crude bowls, had a wider range of food preparation functions than expected.

De Peña, Felicia [140] see Barket, Theresa

de Porras, Eugenia [68] see de Souza, Patricio

de Smet, Peter [182] see Wilke, Detlef

de Smet, Timothy [97] see DiNapoli, Robert

**de Souza, Patricio (Universidad de Chile), Isabel Cartajena (Universidad de Chile), Rodrigo Riquelme (Universidad Católica del Norte), Eugenia de Porras (Instituto Argentino de Nivología, Glaciología Ciencias Ambientales) and Boris Santander (Universidad Alberto)**

**[68]**

*First Human Occupations of the Southern Atacama Desert (24.5° S): Settlement Dynamics and Environmental Context*

The early peopling of the Atacama Desert coincided with the Central Andean Pluvial Event II (CAPE II), an extensive pluvial event during the Late Pleistocene-Early Holocene (13,800–8500 cal yr BP). A large number of early human archaeological sites from this period have been found along the borders of the Imilac and Punta Negra (24.5° S) high altitude basins (ca. 3,000 m asl). By combining the results of proxy data obtained from geomorphological, sedimentological archives and paleoecological (rodent middens), the spatial location of archaeological sites and radiocarbon series analyses, the paper examined, at a finer spatial and temporal scale, discontinuities in the records at different times during CAPE II in the southern Atacama Desert. A link between changes in precipitation regimes and the relocation of settlements, occupation of new spaces, and ultimately the abandonment of the area around the Imilac and Punta Negra salt flats are proposed. The established moisture anomaly threshold led us to rethink the drylands and their moisture changes as well as the minimum conditions for human occupation.

**De Tomassi, Mirko (University of California, Merced)****[152]***A Needle Is Not Always a Needle: Reevaluating Gender-Related Objects from Classic Maya Burials*

Weaving-related objects, mainly spindle whorls and needles, found in prehispanic Maya burials are usually interpreted as an indication of either the identity of the deceased or the activities carried out in life. Such a symbolic approach is valuable in tracking the construction of identity in funerary contexts. However, it can be misleading in some contexts. For instance, the analysis of the meaning of bone needles and spindle whorls found in burials from Classic period (ca. AD 400–700) Palenque, Mexico, demonstrated that relational approaches are necessary to comprehend the nature of funerary objects. This paper proposes to apply the Harris Matrix and the principles of archaeoethnology to understand the taphonomic processes affecting burials and ancient particular cultural practices at Palenque. I argue that this approach is effective to contextualize the said objects and track the physical relationship among elements within burials. My findings show that weaving-related objects were not buried to symbolize social identity. I conclude that the bone needles were used as pins to close either funerary capes or wrapping bundles. Spindle whorls, instead, were used to carry out specific activities involving secondary rituals.

**Declet Perez, Mariela (University of California San Diego)****[72]***Effects of Atmospheric Events over Marine Ecosystems and Precolumbian Societies in Borikén*

Climate change, as a social and environmental stressor, has the potential to threaten food security by disrupting the functioning of ecosystems. This stress is particularly enhanced during intense, unexpected events that can trigger disasters. Precolumbian Caribbean societies faced these stressors through time as environmental changes linked to climate change could have affected the availability and reliability of highly ranked species on traditional resource patches, such as coral reef fish and shellfish. Focusing on marine resources exploitation, this presentation looks at the archaeological record from Tibes Ceremonial Center in Ponce, Puerto Rico, analyzing changes in subsistence behavior before, during, and after a flood event that was possibly triggered by a major hurricane between AD 790 and 1000. The analysis articulates three types of faunal remains, chronology, recent paleoclimate data, and animal behavior to understand ecosystem change and social response, indicating an adjustment of past food exploitation strategies as human adaptation to natural disasters. The analysis concludes that the atmospheric event that flooded Tibes could have had sufficient environmental impact to disrupt the coastal ecosystems, thus leading to a temporary adjustment in the fishing strategies. This observation has important implications to the understanding of social vulnerability in precolumbian fishing societies.

Declet Perez, Mariela [68] see Rivera-Collazo, Isabel

DeCorse, Christopher [67] see Miller, Heidi

**Dedrick, Maia (University of North Carolina at Chapel Hill)****[59]***Feast Days as Place-Making in Colonial Yucatán, Mexico*

As famously outlined by historian Nancy Farriss, mobility was an important survival strategy for Indigenous peoples of the Yucatán peninsula of Mexico throughout the colonial period. During the middle colonial period and beyond, a tension existed between mobility and emplacement, as demonstrated when entire communities threatened to move in protest of mistreatment. At a smaller scale, family groups moving into established communities sought ways to connect, contribute, and thrive socially. One clearly defined way to participate was to support the work of neighbors and community organizations in preparing for a town's annual saint's day celebrations. This paper describes historical and archaeological information about developments in food-sharing practices as well as processions and dances associated with the feast days. It considers the socioeconomic and other identity-based aspects of festival participation within small but diverse communities and the importance of such events for community well-being and resilience. The practice of large-scale food distribution at region-wide events played an important role in the development of a hybrid Yucatecan cuisine with its requisite animal and plant tending and market engagement. Saint's day celebrations past and present contribute meaningfully to place making, and archaeological evidence can help tell this story.

**Deere, Bobi (University of Oklahoma) and Jesse Nowak (University of Oklahoma)****[120]***Heavens on Earth: Cave Imagery and the Legacies of Mississippian Ceremonialism*

Cave art is among the earliest evidence of art in the North American Southeast, and was instrumental in establishing Early Mississippian period iconographic styles. Exploring the imagery found in caves across different cultural regions provides alternative contexts to understand distinct belief systems and ritual practices. This paper looks at the imagery found in caves in the Dhegihan ancestral territory compared to examples of cave art from the traditional ancestral territories of the Cherokee. Through exploring comparative examples, we consider how art with underworld related themes and symbolically charged depictions of games were made significant in cave settings.

DeFoe, Marvin [105] see Walder, Heather

Dega, Mike [83] see Dixon, Boyd

**DeGeorge, Alex (Alta Archaeological Consulting), Kevin Dalton (Henry Jackson Foundation) and Carly Whelan (Chico State University)**

[38]

*Shared Heritage: World War II American Military Loss Sites in Europe*

Historic archaeological sites associated with World War II American military losses on foreign lands represent the physical remains of a shared cultural heritage. Such sites are irreplaceable phenomena of significance to the past of both nations and for the knowledge and understanding of our shared cultural heritage. Recent recovery efforts at a B-17G (Flying Fortress) crash site in southwestern Poland provide an example of how archaeological investigations can meet both the Defense POW/MIA Accounting Agency (DPAA) mission objectives for accounting of missing US servicemen and address host nation historic preservation requirements. Here we tell the story of the loss incident, describe working with the host nation, explain the methods used in the archaeological excavation, and show how artifacts recovered from the site, even those with no evidentiary value, have local interpretative value for public outreach and education. We examine one case study that includes a collaborative museum exhibition.

**Delaere, Christophe (Université libre de Bruxelles) and José Capriles (Penn State)**

[47]

*Lake Titicaca Underwater Offerings and the Ritualization of Bodies of Water during the Inca Period*

As the Inca Empire expanded across the South American Andes during the fifteenth and sixteenth centuries CE, Lake Titicaca became its mythical place of origin and a major pilgrimage complex was built on the Island of the Sun. Nevertheless, before the Inca conquest Lake Titicaca was an inland sea that offered enormous socio-economic opportunities for navigation, fishing, trade, etc., which the Inca redirected to mainly ritual functions. A series of rules and taboos restricted numerous activities on the lake and encouraged others, such as underwater offering practices, aimed at transforming and maintaining this space within the cosmological order. Underwater Inca offerings, consisting of miniature figurines made of precious materials were discovered in sealed stone boxes in the Khoa reef off the Island of the Sun. In the light of a recently reported stone offering box from a reef close to the lake's north-eastern shore, this presentation will discuss the location, content and broader sociocultural context of Inca sacrifices to illuminate the religious and social meaning of underwater ritual offerings at Lake Titicaca.

**DeLeonardis, Lisa (Johns Hopkins University), Dawn Kriss (Metropolitan Museum of Art), Ellen Howe (Metropolitan Museum of Art), Judith Levinson (American Museum of Natural History) and Adriana Rizzo (Metropolitan Museum of Art)**

[133]

*Blue on Clay: Indigo as a Colorant in Andean Post-Fired Ceramic Paints*

Indigo (*Indigofera*) is a recognized plant exudate employed in cloth dyes to produce the color blue. In Andean South America, indigoid dyes have been identified in textiles as early as about 4200 BCE. While in other parts of the Americas the plant is utilized as a ceramic pigment (e.g., "Maya Blue"), in the ancient Andes its use as a paint colorant is virtually unknown. In this paper, we discuss the results of our recent study that demonstrate the presence of the exudate in Paracas (ca. 900–100 BCE) post-fired ceramic paints. Also identified in the paint are uric compounds consistent with reptile excrement. Use of the mixture occurs during a transition period with the Nasca (100 BCE) in which innovations in architecture, iconography, and craft technology are evident. Our discussion centers on how the plant figures within the broader context of these social, iconographic, and technological changes.

**Delsol, Nicolas (University of Florida)**

[129]

*Mesoamerican Cowboys: Exploring the History of Cattle Ranching in Colonial Mexico and Guatemala through Zooarchaeology*

The introduction of cattle soon after the Spanish invasion had numerous and dramatic consequences over the society in New Spain. The historical scholarship on this topic emphasizes the prominent role of cattle ranching, which found its most iconic development in the great central Mexican haciendas that emerged over the sixteenth century and that contributed to shaping the Mesoamerican colonial landscape. The development of ranching practices corresponds to what some authors have coined a "frontier economy" that often emerged in European colonial contexts. Open-range ranching, which can be defined as the free placement of ruminants on large areas of land with the intent to sell the animals as commodities on the market, certainly had consequences not only over the management of the land but also on the organization of labor. Despite these historical accounts, what remains unclear is how widespread were these husbandry practices and what were the biological consequences on the animals themselves. To explore this little-known dimension of Spanish colonialism in Mesoamerica, I propose here to model this mode of husbandry following a set of tests based on traditional zooarchaeological tools such as osteometrics, cull profiles, and pathological markers applied to faunal assemblages from Mexico and Guatemala.

Delvigne, Vincent [77] see Fernandes, Paul

**DeMario, Jeffrey**

[23]

*A Petrographic Analysis of Ceramics from the Prehistoric Maya Site of Hun Tun in Northwestern Belize*

A petrographic analysis was conducted on sherd samples from the small prehistoric Maya site of Hun Tun, located in the hinterlands of the larger elite polity, La Milpa, in Northwestern Belize. Hun Tun contains a chultun, an archaeological feature in the ground which was filled with a clay which was lacking in inclusions. Dr. Robyn Dodge, the archaeologist who first investigated Hun Tun, interpreted the chultun as being used for ritual storage. Twenty-three sherds, as well as four clay samples were made into thin sections, before being viewed under a Zeiss Axioskop 40 polarizing microscope in the Graduate Microscopy Lab in the Jackson School of Geosciences at the University of Texas at Austin. Quantitative and qualitative analysis has shown two distinct petrofabrics at Hun Tun, which I have called the Sand-Carbonate Fabric, and the Carbonate Fabric. These two distinct groups are both

dominated by calcite or dolomite inclusions, with grog (crushed pottery), hematite, and quartz in much lower percentages. Clay samples taken from the chultun, as well as sherds from Hun Tun excavations, are compared to show if the clay which was ritually stored at Hun Tun was also used in ceramic production.

**Derr, Kelly (Historical Research Associates Inc.)**

**[165]**

*Discussant*

Derry, Linda [187] see Gordon, Falicia

**Des Lauriers, Matthew (California State University, San Bernardino) and Claudia García-Des Lauriers (California State Polytechnic University, Pomona)**

**[101]**

*Los Horcones and Teotihuacan: Agency, Art, and Interaction*

Artistic representations are often the most salient indices of interaction between Teotihuacan and other communities throughout Mesoamerica. Interpretation of this artistic evidence, however, is complicated and often quite contested in the archaeological literature. In this paper, we would like to explore further the themes of art and interaction, taking into account the agency of artists who were making decisions within this context of interaction about how to negotiate new artistic languages within a framework of state-sponsored art and in smaller-scale representations often used for domestic settings. The site of Los Horcones, Chiapas, will serve as a starting point for this discussion that will also include examples from other regions where artistic evidence of contacts with Teotihuacan have been identified.

**Desjardins, Sean (University of Groningen), Scott Rufolo (Canadian Museum of Nature) and Martin Appelt (National Museum of Denmark)**

**[179]**

*Avvaja (Abverdjar) Revisited: Reconstructing Tuniit (Dorset Paleo-Inuit) and Recent-Historic Inuit Life at an Iconic Site in Northern Foxe Basin, Nunavut, Canada*

Excavations in the early to mid-twentieth century at the multicomponent site Avvaja (Abverdjar) (NiHg-1), northern Foxe Basin, Nunavut, produced arguably some of the most iconic Tuniit (Late Dorset Paleo-Inuit) artifacts yet found in Inuit Nunangat (the traditional Inuit territories of Arctic Canada). Avvaja is also notable for being the site of the region's first Christian mission (est. 1931), as well as for being one of the last major seasonal camps abandoned by Inuit for the nearby permanent settlement of Igloodik (Igloodik). Despite its archaeological renown and historical significance, little information has been made widely available about the site's occupations or the contexts of its remarkable Tuniit finds. In this paper, we provide an overview of previous archaeological work at the site, and present the results of ethnoarchaeological research carried out in 2018, consisting of intensive drone and DGPS survey, limited excavation (resulting in new radiocarbon dates), and close consultation with former residents of the site and their family members.

**[179]**

*Chair*

**Desmarais, Danii, Lesley Howse (University of Toronto), Mari Kleist (University of Calgary) and Letitia Pokiak (University of Victoria)**

**[179]**

*Accountability in Arctic Archaeology: A Continuing Conversation for Change*

Within Arctic archaeology, we are encouraged by community-led and partnership projects to continuously rethink our research practices. These projects have demonstrated that change is possible, it can be done successfully, and it leads to rich holistic narratives of past lifeways. However, more attention needs to be given to how current practices contribute to the marginalization of Inuit researchers and communities, whose ways of life, cultural heritage, and homelands are the focus of our research. In 2018, Inuit Tapiriit Kanatami (ITK) released the "National Inuit Strategy for Research" moving toward Inuit self-determination in research. We call on our colleagues to join us in implementing the ITK strategy, to spend more time reflecting on and critically evaluating the impacts of our practices and sit with some uncomfortable truths. As Indigenous and settler archaeologists, we look at the power dynamics within archaeological research across Inuit Nunangat and Kalaallit Nunaat. We discuss the importance of engaging with the broader discourse on "unsettling/decolonizing" research, critical race studies, and most importantly centering Inuit voices. Only as a collective, speaking the truth of our impact and holding each other accountable, can we affect and sustain critical transformations that move the practice of Arctic archaeology ethically forward.

**Deter-Wolf, Aaron (Tennessee Division of Archaeology)**

**[73]**

*Discussant*

**Dewan, Eve (Warm Springs Geo Visions), Brandon Gilliland (Warm Springs Geo Visions), Lindon Hylton (Warm Springs Geo Visions) and Angelina Howell (Warm Springs Geo Visions)**

**[8]**

*Conscious Conservation in an Era of Catastrophe*

For nearly two decades, Warm Springs Geo Visions has been a small, independent, tribally owned firm dedicated to the environmental compliance needs of the Pacific Northwest. Working with a range of federal, state, tribal, and private stakeholders, the company brings a unique set of strengths and perspectives to bear on projects including cultural resource surveys, ethnographic overviews, and archival and oral historical research. The past year has ushered in an unprecedented era of growth as the company has opened a second office to better serve the Portland Metropolitan Area, hired new team members, and continued the transition to more sustainable field practices. Alongside these exciting opportunities have been challenging issues faced by the rest of the world: the COVID-19 pandemic and accelerated climate change. These crises have led our company to adjust how we work and to reflect on our impacts on the natural and cultural environment. In this poster, we share lessons learned and future plans to continue our mission of Conscious Conservation in hopes of connecting with others who strive to integrate care and compassion into their work amid ongoing challenges.

Dewar, Genevieve [24] see Feak, Angela  
Dewar, Genevieve [151] see Stewart, Brian

**Dewey, Jennifer (University of Oklahoma)**

[9]

*Osteobiographical Investigations: The Case of Anomalies in the Spine*

This research reconstructs the osteobiography of an unprovenanced male individual that is part of an anatomical collection house at the University of Oklahoma to get more information about his life. This is done by reconstructing his biological profile and investigating possible habitual activity through skeletal indicators. Specifically, the analysis activity will involve studying underlying causes that could have contributed to the development of an exostosis on the thoracic spinal lamina. The research questions include: (1) What are the structures influencing the development of an exostosis on the spinal lamina? (2) Are these changes consistent with adaptive bone modeling? (3) What can this tell us about the life of this individual? Preliminary results indicate that the rotatores muscle groups act directly on the area. These muscles are responsible for the extension and rotation of the thoracic spine. The presented development of the exostosis corresponds to what is expected from remodeling/modeling of an enthesal attachment site. The development suggests a need for a more precise and efficient attachment for the tendon insertion of these muscles, possibly due to repeated significant loading events involving extension and rotation of T8–11.

**Dey, Darienne**

[121]

*Discussant*

**Diehl, Richard (University of Alabama and Boundary End Archaeological Research Center)**

[107]

*Discussant*

**DiNapoli, Robert (Binghamton University), Carl Lipo (Binghamton University), Timothy de Smet (Binghamton University) and Diana Greenlee (University of Louisiana, Monroe)**

[97]

*Refining the Chronology of Earthwork Construction in the Lower Mississippi Valley Archaic Period*

The culture history of southeastern North America is characterized by several episodes of monumental mound building, particularly during the Woodland and Mississippian periods. Some of the earliest manifestations of mound construction occur in the Middle and Late Archaic periods of the Lower Mississippi River Valley. The Late Archaic site of Poverty Point stands out as an early location of intensified earthwork construction. With the exception of isolated features, however, the overall chronology of the Poverty Point deposits has not been explicitly modeled. Here, we create a series of Bayesian chronological models for mound and ridge deposits at Poverty Point and other Middle and Late Archaic sites. We produce model-based estimates to help resolve issues related to the overall tempo, ordering, and contemporaneity of earthwork construction in the region.

DiNapoli, Robert [97] see Dye, Thomas  
DiNapoli, Robert [130] see Hanna, Jonathan  
DiNapoli, Robert [130] see Rieth, Timothy

**Diop, Pape Laity (Cheikh Anta Diop University, Dakar Senegal)**

[146]

*Another Form of Slave Ship: Local Nautical Technologies and Practices in the Persistence of the Senegambian Slave Trade (1818–1888)*

Despite its abolition by France in 1818, the slave trade continued along the coasts of Senegambia until 1888. When, in 1822, France created a special African naval squadron stationed at Gorée Island to patrol the West African coasts, slave traders in the Senegambia responded by developing new strategies to escape French vigilance. This paper explores these strategies, focusing in particular how slave traders began to use used less suspicious local dugout canoes to transfer slaves to the Cape Verde islands where the slaves were then loaded onto larger slave ships for transatlantic exportation. Examining the structural characteristics and technical efficiencies of these local watercraft that represent another form of “slave ship,” this paper also demonstrates how slave traders exploited the weakness of trafficking contraventions laws and the bad faith of authorities. These strategies effectively neutralized naval security, enabled the traffic to persist for almost 70 years after it became illegal, and even transformed the

transatlantic segment of slaving voyages by significantly shortening the distance traveled on larger ships from Cape Verde, destined primarily for Cuba and Brazil.

**DiPietro, Lyndsay and Kelly Graf (Center for the Study of the First Americans, Texas)**

[34]

*Micromorphological Analysis of Deposition, Pedogenesis, and Stratigraphic Integrity at the McDonald Creek Site, Central Alaska*

Despite the fact that archaeologists have long turned to the Alaskan archaeological record to answer questions about the first Americans, little is certain about the peopling of Beringia. The poor preservation of faunal remains in many central Alaskan archaeological sites has made understanding the variability of lithic assemblages and, by extension, the behavior of early Beringian populations difficult. The McDonald Creek site, a multicomponent site containing at least two late Pleistocene assemblages including lithic artifacts, faunal, and macrobotanical remains in a primary context, may shed new light on the relationship between the inhabitants of the site and their changing environment over the course of the late Quaternary. This study uses soil micromorphology to characterize the depositional and pedogenic processes that have led to the development of the sediment package at McDonald Creek, as well as to assess the extent to which periglacial processes and solifluction may have disturbed the integrity of the archaeological record at the site. This new understanding of soil development helps to establish the sequence of paleoenvironmental changes at the site since the late glacial period and will help to contextualize the technological, subsistence, and settlement records at McDonald Creek.

DiPietro, Lyndsay [52] see White, John

**Diserens Morgan, Kasey (University of Pennsylvania)**

[86]

*Politicizing Heritage: How Government Protections Use Heritage Assets to Control the Maya Past*

Political involvement in the protection of historic resources often places a façade on historic narratives that creates a distance between communities and their heritage. Often, this control reflects leftover colonial legacies, creating structures of power that do not allow communities to advance economically, socially, or politically. This paper explores the politicization of the narratives and artifacts from the Caste War (1847–1901), in Tihosuco, Quintana Roo, Mexico. I analyze the various actions and discourses used by local, state, and federal politicians to legitimize particular values and claims over objects, people, and narratives of the rebellion. These discourses seek to both standardize and differentiate heritage objects as tools for economic, political, and social gain in the “Zona Maya.” In particular, I will address how the legal standards and preservation initiatives regarding the over 60 prewar-era buildings located in Tihosuco have become a point of contention, as differing levels of ownership under federal law have created tensions between politicians and the people that live within the historic structures. The physical structures themselves have been transformed by the processes of protection, and the narratives have been exploited as a means to fuel the global heritage tourism industry in Mexico.

**Dixon, Boyd (Cardno GS Inc.) and Mike Dega (Scientific Consultant Services, Hawaii)**

[83]

*Placing the Early Pre-Latte Period Site of San Roque on Saipan in Its Broader Context*

This comparative assessment of the San Roque site in northern Saipan to other early Pre-Latte period sites in the Mariana Islands, ca. 1500–1100 BC, presents far from uniform data that suggest that maritime settlers of the archipelago may have targeted a range of natural settings for survival upon arrival. These settings appear to have included inland estuaries and marshes for planting aroids, cliff lines with caves for fresh water and native forest resources, and beach dunes with shallow lagoons and offshore reefs for suitable canoe landings from which to fish and travel. Recent DNA research and similarities in material culture suggest multiple origins along a “cultural corridor” from the Philippines to Sulawesi and island Melanesia ca. 1500–1100 BC, long enough to foment Lapita and Pre-Latte traditions in what was by then no longer Remote Oceania.

**Dixon, E. James (University of New Mexico) and Loren Davis (University of Oregon)**

[98]

*The Rose Room Workshop*

This presentation reports the outcomes of a workshop held at the Smithsonian Institution Museum of Natural History, Washington, DC, June 2019. The workshop identified stakeholders, collaborations, and synergistic relationships to establish and expand cooperative interdisciplinary and agency partnerships to encourage, advance, and support submerged landscape (non-shipwreck) archaeology and paleoecological research on North America’s continental shelves and the Great Lakes. Participants defined stakeholder interests, federal and state responsibilities, sources of fiscal support, methodological and technological needs, and tribal and cultural interests and concerns. Working groups identified potential ways to establish cooperative structure(s) to consolidate and/or pool human, logistic, technological, and financial resources to advance research. Results and recommendations for future directions were defined in a summative action plan. Fiscal support provided by the National Science Foundation, OPP #1735494, Smithsonian Institution, Department of Anthropology, Museum of Natural History, and Oregon State University.

Dobney, Keith [83] see Weyrich, Laura

**Doherty, Caitlin (Texas A&M University)****[95]***New Perspectives from Smith Creek Cave: A Lithic Technological and Geochemical Analysis of the Paleoindian Assemblage*

With the recent reporting of pre-Clovis-aged Western Stemmed components at archaeological sites in the Great Basin, there is renewed interest in the previously excavated Paleoindian assemblage from Smith Creek Cave. There, a stemmed-point component was originally dated to approximately 13,000 years ago. A thorough technological analysis of the lithic assemblage, however, was never completed, making comparison to other contemporaneous sites in the eastern Great Basin difficult. Here, building on a recent study of the Smith Creek Cave bifaces, a technological analysis of the entire Smith Creek Cave lithic assemblage, including unifacial tools and debitage, is reported and combined with a geochemical analysis of the obsidian and fine-grained volcanic materials. This data provides useful information regarding the lithic technological organization and mobility strategies of the prehistoric visitors to Smith Creek Cave and allows the site to be placed in a regional context for the Paleoindian Great Basin.

**Dolan, Sean (N3B Los Alamos National Laboratory)****[91]***Turkeys in the Mimbres Valley, New Mexico: Pottery Iconography, Genetics, and Diet*

Understanding the cultural and environmental context of turkey (*Meleagris gallopavo*) domestication and husbandry contribute to key issues in anthropological archaeology and social zooarchaeology. Despite recent advances in turkey studies in recent years, the extent of domestication and husbandry remains unresolved for the Mimbres Valley in southwestern New Mexico. Using pottery iconography, mitochondrial DNA analysis, and stable carbon and nitrogen bone isotope analysis, I discuss how people lived alongside turkeys during the Mimbres Classic period (AD 1000–1130). Preliminary results indicate that Mimbres potters were familiar with turkey anatomy, haplogroup H2 wild turkeys were more common than haplogroup H1 domesticated turkeys, and turkeys of both genetic lineages consumed a C<sub>4</sub> (presumably) maize diet, but some wild turkeys had a non-maize C<sub>3</sub> diet. I evaluate possible pathways of domestication, husbandry, and aviculture; socioecological interactions between Mimbres groups and turkeys; and the use of turkeys for ritual and utilitarian purposes during the Classic period. Finally, I provide insights into how Mimbres groups managed turkeys compared to their northern Ancestral Pueblo neighbors.

**Dombrosky, Jonathan (Department of Anthropology, University of New Mexico)****[129]***Fish Body Size and Ancestral Pueblo Foraging Decisions in New Mexico, ca. AD 1350–1600*

Small numbers of fish remains are frequently recovered from Pueblo IV (AD 1350–1600) sites in the Middle Rio Grande basin of central New Mexico, but they are rare during earlier time periods. Increased aquatic habitat quality during this time could have increased fish body size and the energy obtained by Ancestral Puebloan fishers could have been maximized. Paleozoologists, however, frequently estimate the body size of fishes from skeletal remains with linear measurements and cherry-picked specimens. Such an approach will not work with archaeological fish assemblages from the American Southwest/Mexican Northwest. The relatively small size of fish assemblages requires that the remains present be used more efficiently. Here, I use a 3D geometric morphometric approach to estimate the body size of archaeological fishes more accurately and efficiently from fragmented skeletal remains recovered from the Middle Rio Grande. Such an approach can help rigorously test whether a shift in body size made the pursuit of fishes in small quantities optimal for Ancestral Pueblo people.

Dombrosky, Jonathan [91] see LaZar, Miranda

**Domeischel, Jenna (US Army Corps of Engineers)****[183]***Building the Middle-Ground Archive: A Resource for Navigating Burial Laws, Regulations, and Guidance*

In early 2017 a human skull was left outside the front door of the Blackwater Draw Museum in Portales, New Mexico. No one saw it arrive; it was simply there when the museum opened that morning. Facilities that curate or display archaeological materials encounter situations such as this more frequently than one might expect, and often it is hard to locate guidance on how to properly curate, repatriate, or otherwise care for these materials when legal custody or ownership is difficult to determine. This project evolved out of a need to centralize and make available information about laws, regulations, and other forms of guidance related to human remains in archaeology, especially as they pertain to repositories. While repositories are often on their own to create best practices for their collections, there are legal requirements they must also address. Federal laws like the Native American Graves Protection and Repatriation Act are well-known, but local and state laws can be overlooked, as can guidance produced for tribal lands. This project builds on an existing foundation to produce an online archive of resources in an effort to eliminate these potential ethical quandaries for repositories.

**Domenici, Davide (University of Bologna, Italy)****[133]***Discussant***Domenici, Davide (University of Bologna, Italy)****[180]***Tridimensionality, Multimediality, Polychromy, and Other Forms of Visual Complexity in Late Postclassic Mosaic Art*

Building on previous works that led to the definition of various stylistic families within the corpus of Late Postclassic central and southwestern Mexican mosaics, the paper explores the various formal and technological resources that each group of mosaics employed to attain specific forms of visual complexity. Tesserae shapes and dimensions, cabochons, and juxtaposition of materials with various colors and textures, as well as the use of codified motifs that functioned as iconographic property qualifiers, are among

the diverse—and often alternative—practices that ancient lapidaries employed to create artworks whose surfaces could interact in a complex and meaningful way with light and, ultimately, with the observer's gaze.

[180]

Chair

**Domínguez, Miriam (Drew University)**

[149]

*An Archaeological History of the Tamaylacha (Jubones) River Basin, circa First Millennium BCE*

The earliest written descriptions of the Tamaylacha (Jubones) River and its surroundings were penned by the priest Pedro Arias Dávila (1582) during his journey(s) through Cañari territory. These were followed by the accounts of Francisco José de Caldas who joined the research expedition of von Humboldt and Bonpland in 1804, the accounts by Verneau and Rivet (1912), and a few other observers of what today is southern Ecuador and northern Peru. Beyond these chronicles and travelogues, archaeological analyses of this inter-Andean river basin further refine our understanding of the Indigenous history of the region. This paper outlines, first, the results of the compositional analysis conducted on the ceramic wares from the site of Potrero Mendieta, dated to around the first millennium BCE, which are interpreted as proxies of social interregional interaction. Second, the spatial configuration of the site, which lies on a flat hilltop overlooking the Jubones, will be discussed and the results of the preliminary excavations of the semi-sunken circular structures that were built at Potrero Mendieta will be presented. Finally, the regional significance of this human enclave will be contextualized with regard to the broader research on the Formative of southwestern Ecuador.

Dominguez, Victoria [149] see Ayers-Rigsby, Sara

Donathan, Gavin [24] see Waters, Albert

Dong, Yu [29] see Miller, Melanie

**Dongoske, Kurt (Zuni Cultural Resource Enterprise) and Kurt Anschuetz (Rio del Oso Anthropological Services LLC)**

[49]

*Cultural Resource Management, Archaeological Collections, and Ethical Issues Associated with Representations of Indigenous Time, Space, Materiality, and Historicity*

A dominant view in cultural resource management is that the archaeological record and its material culture have much to offer in the creation of scientific data, elucidating the past, and contributing to cross-disciplinary scientific studies. This dominant view is indelibly grounded in the ontology and epistemology of Western science, which gives little consideration of how this perspective negatively impacts Indigenous communities. Indigenous community members view themselves as more than the descendants of past people who lived in their homeland landscapes. The material culture found in these places is their inheritance, and descendant communities possess stewardship obligations to their ancestors. Employing our experience with the Zuni and Acoma people, this paper explores the multiple ways that dominant forms of archaeological data collection and management hegemonize Native Americans' notions of time, space, and materiality. The process of compiling and managing archaeological collections unintentionally perpetuates colonial violence on Indigenous communities and individuals through the theft of cultural materials that belong to the ancestors. These actions effectively erase Native Americans' connections to the landscape. The archaeological, cultural resource management, and curation communities have ethical responsibilities to descendant community members because they are not just representatives of sovereign nations, they are also fellow Americans.

Donn, Leila [119] see Beach, Timothy

**Donner, Kristin (Project CLA: Creative Learning through Archaeology) and Laura Harrison (USF)**

[78]

*Mix, Mold, Fire! Multimedia Educational Outreach inspired by Bronze Age Archaeology*

While fascination with archaeology is commonplace among children, family media content often focuses on problematic narratives of treasure hunting. This presents a need for archaeologists to reach out to young audiences with a more balanced narrative—one that conveys the value of heritage resources and counteracts the damaging perception of archaeologists as looters. In this paper, we discuss preschool, fourth-grade, and sixth-grade versions of a multimedia educational outreach lesson that incorporates 2D comic art, 3D representations of heritage objects, and experimental archaeology. All lessons begin with an introduction to the comic "Mix, Mold, Fire!" that features the misadventures of Abby, a young apprentice potter in the Early Bronze Age village of Seyitömer Höyük in Anatolia, whose activities are archaeologically attested. Multimedia lessons expand on this story: pottery-making activities are based on Abby's methods, and students interact with 3D scans and 3D prints of heritage objects then use these interactions as inspiration for creating their own archaeologically inspired comic stories. These lessons introduce young audiences to fundamentals of archaeology. They learn about hands-on engagement with the archaeological record "at the trowel's edge" and explore the process of building narratives about the past from analysis of material culture remains.

Donner, Natalia [132] see Geurds, Alexander



**Donta, Christopher (SWCA)****[47]***The Narrow Point Tradition and Long-Term Continuity in the Northeast*

The Narrow Point tradition extends across a wide area of eastern North America and its signature point type is one of the most frequently found in Archaic contexts in New England. Decades of research on the relationship between Narrow Points and other types of the Late Archaic period has not yet produced a consensus regarding their use and origins. However, data collected in recent years add significantly to this discussion, in relation to associations with features and dated contexts. This paper looks at radiocarbon dating of Narrow Point or Small Stemmed features across southern New England to document the connections between this point type and others during this complex time period. The onset of the Narrow Point tradition is increasingly being linked with Middle Archaic sites and technology, indicating long-term continuity of settlement across the Late Archaic and into the Woodland period. Other Late Archaic tradition types occur only as additions to a Narrow Point base, and likely represent technological supplements, not incursions of people. These data address questions as to the origins of Algonquians in New England and their relationships to the greater Northeast during the Archaic.

**Donta, Jaime (POWER Engineers)****[134]***Moderator*

Doperalski, Mark [27] see Oberheim, Paul

Doran, Thomas [33] see Engen, Danica

**Dorland, Steven (University of Toronto)****[103]***Where Were the Children Learning? A Spatial Analysis of Childhood Potting Practices in Fifteenth-Century Great Lakes Villages*

Investigations of childhood practices in the Great Lakes have emerged through ceramic analysis and skill evaluations. This approach has been effective in tracing direct material interactions of potters and social relations within a communities of practice. However, there is less focus on potters and their relations to the village environment. Spatial analysis has been effective in understanding childhood practices in other spatiotemporal contexts, but there has been limited focus on Great Lakes childhood experiences. Through an analysis of artifact distribution, this paper investigates spatial interactions and their relation to learning experiences. I apply a distribution analysis of learner vessels from two mid to late fifteenth-century northern Iroquoian villages, Draper and Keffer, to evaluate the presence of learning areas and workshop spaces and to evaluate the spatial degree of freedom that children experienced in village spaces. I then construct object histories of learner artifacts to shed further light on childhood learning environments. The results lead me to suggest that children engaged in similar learning environments throughout the village and were not practicing in specialized workshop areas. A focus on village interactions leads to new questions relating to social learning and broader knowledge production practices in the Great Lakes region.

**Dorr, Lana (Hamilton College), Colin Quinn (Hamilton College), Horia Ciugudean (Muzeul National al Unirii-Alba Iulia), Laura Motta (University of Michigan) and Lacey Carpenter (Hamilton College)****[13]***The Consequences of Cultural Encounters on Late Bronze Age Transylvania Cuisine and Subsistence Economies*

The transition to the Late Bronze Age in Transylvania around 1500 BCE coincided with the arrival of the Noua cultural group from the Eurasian Steppe. These new migrant communities arrived in a Transylvanian landscape that had been occupied by the Wietenberg cultural group for over 500 years. For nearly 150 years, communities with both the Noua and Wietenberg cultural identities lived and interacted within the same landscape. In this poster, we explore the consequences of these cultural encounters on the foodways of Transylvanian communities. Wietenberg communities relied upon a broad range of domesticated and wild resources. In contrast, Noua communities relied heavily on domesticated plant and animal resources. Drawing upon faunal, paleobotanical, and artifactual remains, we present new evidence for the exchange of food between Wietenberg and Noua communities. The processes of interaction in Late Bronze Age southwest Transylvania shed light on the socioeconomic context and consequences of migration.

**Dorshow, Wetherbee (University of New Mexico)****[66]***Finding Sites in the Amazon Forest: AI-Based Deep Learning Analysis of Satellite Imagery from the Upper Xingu Basin, Brazil*

This paper summarizes preliminary results of an AI-based analysis that identifies potential precolumbian Amazonian archaeological site locations based on the presence of clusters of a specific species of palm tree. The study uses Landsat-8, Sentinel-2, and Planet satellite imagery as input to Deep Learning Object Detection AI analysis, delineating potential for the presence of disturbed plaza areas, trash mounds, and Terra Preta / Egepe zones (anthropogenic soils) indicative of large precolumbian sites in the Upper Xingu Basin.

**Dougherty, Haley (University of Nevada, Las Vegas)****[46]***Is This a Sand Temper?*

The UNLV Shivwits Research Project has excavated at numerous Virgin Branch habitation sites since its inception more than 15 years ago. Sand-tempered ceramics recovered from these projects, which represent the first large-scale investigations conducted in the area, exhibit a high degree of variability in terms of their mineralogy and paste color. This paper discusses the ceramic variation observed across the studied sites as well as problems encountered with sand-temper ware analysis and identifying geological inclusions related to manufacturing techniques. I suggest, that for at least the Virgin Branch typology, new methods for categorizing sand tempered types should eliminate clay ambiguities and paste disparities recorded in the series for these types.

**Douglas, Allison (University of Oklahoma)**

**[75]**

*Moderator*

Douglass, Kristina [72] see Hixon, Sean

Douglass, Matthew [58] see Davies, Benjamin

Douglass, Matthew [49] see Holdaway, Simon

Dowling, Katherine [35] see Wholey, Heather

**Doyon, Luc (IdEx, Université de Bordeaux; Institute of Cultural Heritage, Shandong University), Zhanyang Li (Shandong University), Hui Fang (Shandong University) and Francesco d'Errico (Université de Bordeaux)**

**[141]**

*A Paleolithic Bird Figurine from the Lingjing Site, Henan, China*

Carving a figurine requires the ability to mentally visualize a volume in matter and create symmetries in a 3D space. During the Paleolithic, such objects were likely made to be transported, curated, manipulated, and hung on clothing. Thus far, no instances of 3D portable art were documented in East Asia before the Neolithic. We report the discovery of a well-preserved miniature carving of a standing bird from the Lingjing site, Henan, China. Microscopic and  $\mu$ -CT analyses of the figurine and the study of bone fragments from the same context reveal the object was made of bone blackened by heating and carefully carved with four techniques that left diagnostic traces on its entire surface. An analysis of the site's research history and stratigraphy as well as 28  $^{14}\text{C}$  ages obtained on associated archaeological items suggest a Late Paleolithic origin for the carving, with an age estimated to 13,500 cal BP. The carving predates previously known instances from this region by 8,500 years, demonstrates that 3D avian representations were part of East Asian Late Pleistocene cultural repertoires, and identifies technological and stylistic peculiarities distinguishing this newly discovered artwork from previous and contemporary examples found in Western Europe and Siberia.

**Dozier, Crystal (Wichita State University), Angelina Perrotti (Brown University) and Elayne Rye (Wichita State University)**

**[3]**

*Effects of Acetolysis on Starch Granules*

The ability to concurrently analyze multiple microfossils from the same paleoecological or archaeological sample would allow for faster and multi-evidenced analyses. Most microfossils require chemical processing to become identifiable under different types of microscopy; acetolysis is commonly employed in palynological study. We present the effects of acetolysis on four starch taxa. Acetolysis differentially affects starch granule morphology. While all of the native (undamaged) starches were unaltered from acetolysis, the exterior texture of two ground (damaged) starch taxa were noticeably impacted after acetolysis. Acetolysis caused slight shrinkage in the average size of starch granules, but not at a statistically significant level. The capacity to conduct starch analysis from acetolyzed samples is discussed for archaeological and paleoecological study.

Drake, Lee [7] see Davis, Mary

**Drake, Stacy (The Field Museum)**

**[161]**

*Discussant*

Drexler, Carl [81] see Colaninno, Carol

Druc, Isabelle [125] see Espinosa, Alicia

Drucker, Dorothée [72] see Wong, Gillian

**Duarte, Ricardo (Eduardo Mondlane University-CAIRIM), Yolanda Duarte (Eduardo Mondlane University-CAIRIM) and Stephen Lubkemann (George Washington University)**  
**[146]**

*Mozambican Maritime Landscapes of Slaving and Exchange: New Directions*

This paper focuses on ongoing and emergent archaeological investigations that are opening new vistas on Mozambique Island's global maritime interactions over the last millennium. Providing a brief overview of the program of collaboration between the Slave Wrecks Project and Eduardo Mondlane University that investigates submerged sites in conjunction with terrestrial ones in order to build a picture of an evolving "maritime landscape of slaving and exchange," this presentation will highlight recent findings on two of these sites which offer different levels of resolution on Mozambique's global maritime past: an "Arringa" in the remote Tete interior from which slaves were funneled through the island into both Atlantic and Indian Ocean trades at the end of the eighteenth century; and a site on the island itself that is recalibrating our understanding of over a millennium of Mozambican trade and social interaction across the Indian, and later Atlantic, Oceans.

Duarte, Yolanda [146] see Duarte, Ricardo

**Duffy, Lisa (University of Florida) and Timothy Garrett (University of Florida)**  
**[1]**

*Metabolomics in the Study of Ground Stone Tools*

Archaeological ground stone tools used for food processing have proven to be rich sources of residues, in particular microbotanicals such as pollen, phytoliths, and starch grains. This data adds to the studies of tool function, foodways, and other lines of archaeological inquiry. To date, ground stone has not been the target of chemical residue analysis, specifically metabolomic analysis via liquid chromatography–mass spectrometry (LC-MS) in the pursuit of ancient food residues. For this study, ground stone artifacts from ancient Maya sites in Belize and Guatemala were evaluated to determine whether this type of organic residue analysis is successful in recovering chemical signatures. UHPLC-HRMS was utilized and a variety of metabolites of interest were identified. Compounds recovered included carbohydrates, alkaloids, fatty acids, and other metabolites with the potential to inform on a variety of food resources. These results demonstrate the utility of ground stone artifacts as potential resources for recovery of metabolites important to the study of ancient foodways.

Duffy, Lisa [136] see Emery, Kitty

Duffy, Paul [97] see Boric, Dusan

Dufresne, Philippe [97] see Lanos, Philippe

**Duke, C. Trevor (University of Florida), Neill Wallis (Florida Museum of Natural History) and Ann Cordell (Florida Museum of Natural History)**  
**[125]**

*Networks of Embodied Practice: Personhood, the Body, and Potting Skill in the North American Southeast*

Archaeologists over the last two decades have become increasingly interested in the relationship between personhood and the human body. Bodily engagement with the material world can create and reproduce different kinds of social understandings, and is a means by which persons make subjectivity durable, transmissible, and experiential. While case studies of personhood have generally been beneficial for the field of archaeology, few have focused on how differences in skill level impact social categorization. For instance, part-time potters may not self-identify specifically as "potters." Conversely, specialized mortuary potters that received years, perhaps decades, of hands-on training are much more likely to identify with their craft. We use metrics of potting consistency to evaluate differences in skill from Late Woodland (ca. AD 650–1050) and Mississippian (ca. AD 1050–1550) mortuary contexts in the Tampa Bay region. We also employ petrography and neutron activation analysis (NAA) to identify where across the southeastern landscape these differences in skill occurred. We argue that while specialized mortuary potters were present during both the Late Woodland and Mississippian periods, they put their skill to use for different purposes due to changes in social networks, and thus became fundamentally different kinds of social subjects.

**[125]**

*Chair*

Duke, Daron [7] see Davis, Mary

Duke, Guy [14] see Juengst, Sara

**Dull, Robert (California Lutheran University)**  
**[138]**

*Discussant*

Dumouchel, Laurence [42] see Pobiner, Briana

**Duncan, Joshua (Texas State University) and Todd Ahlman (Texas State University)****[32]***European Ceramics in the Caribbean: A Glimpse at Globalization during the Colonial Era*

The Dutch Caribbean island of St. Eustatius (Statia) was a free port for much of the seventeenth and eighteenth centuries where the forces of globalization, such as people, resources, commodities, and ideas moved unceasingly, altering the world as it was and pushing it closer toward the world we know today. Through the colonial period, Statia profited from the successes of the Dutch "Golden Age," the Industrial Revolution in Britain, and the American Revolution, and once housed goods from around the world in its 200+ warehouses. Statia has remained largely untouched by tourism and development, and the island's archaeological record remains mostly intact, meaning that it is literally covered with colonial-era remains. This poster examines ceramic artifacts from recent investigations at a colonial-era industrial sugar complex in order to understand the origins of globalization and mass-consumerism as they emerged in the region and shifted throughout the colonial period. Ceramic assemblages from Dutch and British Caribbean sites were compared to the Statian assemblage to address whether any differences or similarities existed between Dutch and British consumerism during this period. The results of this research highlight the increasing complexity of international trade that formed the origins of globalization as we know it today.

Dunseth, Zachary [191] see Butler, Don

**Dupey, Elodie (Instituto de Investigaciones Históricas, UNAM)****[180]***Polychromy in Nahua Art*

Through the analysis of several examples of Nahua artistic expression, including the mural paintings of Tlaxcala, the Borgia Group codices, and a wood sculpture encrusted with mosaic, this paper aims to demonstrate that the societies of Late Postclassic central Mexico cultivated a strong interest in polychromy, perceptible in these artworks' sophisticated manipulation of coloring materials and chromatic ranges. I will pinpoint different strategies selected by the artists to create polychrome pieces, depending on the media and materials they handled, from the use of complex palettes in the codices to the harmonious accumulation of small areas of color to create chromatically saturated images in murals and mosaics. I will also attempt to outline the values and meanings conveyed by polychromy in Nahua aesthetics, based on what the artworks show as well as an exploration of Indigenous discourses on artistic practices and a comparison with the use of colors in poetic images.

**[180]***Chair*

Durand, Karen [115] see Weaver, Brendan

**Duwe, Sam (University of Oklahoma)****[4]***Nuute'owingeh: Complicating Our Understanding of Historic Period Pueblo Settlement in the Northern Rio Grande*

Between the sixteenth and seventeenth centuries the settlement patterns of the Pueblo world of northern New Mexico fundamentally shifted. The "abandonment" of much of the Pueblo's traditional homeland, and the subsequent coalescence of people in large villages along the Rio Grande and its major tributaries, has long sparked interest from archaeologists and historians. Was this movement the continuation of a centuries-long process of Pueblo coalescence, or rather a response to early Spanish contact and colonization? If the latter, what kinds of negotiations and tensions arose in the contestation of landscape between these disparate peoples? And, how have Pueblo people maintained ties with their sacred places in the face of dramatic changes in land access and ownership? I explore the complicated history of Nuute'owingeh, an ancestral Tewa village located in the Rio Chama valley, thought by many archaeologists until recently to be lost to development. The village offers a unique opportunity to address these questions because it appears to have sporadically housed Tewa people from the thirteenth through eighteenth centuries, spanning prehispanic life, the time of Spanish contact and initial colonization, and the Pueblo Revolt and its aftermath. I specifically focus on architecture and pottery and lithic material culture.

**Dye, David (University of Memphis)****[51]***Mississippian and Oneota Entanglements: Iconography and Ritual in the Lower Mississippi Valley*

Mississippian and Oneota entanglements were often violent, typically resulting in intercommunity conflict, loss of life, and population displacement. However, Mississippians in the northern Lower Mississippi Valley may have comprised a sufficiently large territorial bloc to have successfully thwarted Oneota aggression. In this paper I suggest Mississippian-Oneota interactions during the Late Mississippian period were sedimented in rituals resembling early contact period Calumet ceremonies. Oneota motifs on ceramic bottles and the presence of Siouan disk-style pipes offer compelling evidence for ritual protocols that engendered mutually beneficial interactions between neighboring Mississippian and Oneota polities, perhaps resulting in sustained contact.

**Dye, Thomas (University of Hawai'i), Caitlin Buck (University of Sheffield) and Robert DiNapoli (Binghamton University)****[97]***Reasoning between the Lines: The Chronology of Phyletic Seriation*

The joint posteriors of Bayesian calibration can be analyzed with Allen's interval algebra to guide phyletic seriation, which comprehends the three modes of artifact change recognized by evolutionary archaeologists, including anagenesis, cladogenesis, and reticulation. Using the example of beads recovered from stratigraphically unrelated Anglo-Saxon female graves, reticulation is

identified as the evolutionary mode with the strongest chronological signal. Now that the study of ancient DNA has put reticulation back on the agenda by documenting the movement of people across social boundaries, phyletic seriation guided by Allen's interval algebra adds a potentially useful tool to the archaeologist's kit.

[97]

Chair

**Dye, Thomas (University of Hawai'i)**

[164]

Moderator

Dye, Thomas [97] see Moody, Bryony

**Earle, Julia (University of Texas, Austin) and Lina Macedo Molina (Universidad Nacional de San Antonio Abad del Cusco)**  
[47]

*Traditions of Tomb Construction during the Late Intermediate and Inka Periods (ca. 900–1532 CE) in the Vilcanota Valley, Peru*  
During the Late Intermediate period (900–1400 CE), many communities throughout the Andean highlands built funerary towers (*chullpas*) to inter the dead. The distribution of *chullpas* has often been understood to materialize ethnic identity, territorial boundaries, and claims to natural resources. However, results of fieldwork carried out in the Vilcanota Valley, Peru, in 2019 reveal an overlapping distribution of funerary structure types—including *chullpas*, and open and closed cliff tombs—built during the Late Intermediate period and Inka period (1400–1532 CE). This distribution pattern and the diversity of tomb types across the study region suggest that tombs did not always mark rigid territorial boundaries; instead, the presence of more variable mortuary traditions in some areas may indicate the cohabitation of different ethnic groups. Moreover, the form and accessibility of tomb types appear to correspond to at least two distinct religious traditions. This paper will discuss the social organization of tomb construction, and how the materiality of different tomb types facilitated distinct ritual practices in a shifting political landscape. In addition, Inka tombs will be evaluated as part of a broader program of elite construction projects, and contextualized among local traditions of tomb construction in the Vilcanota Valley.

**Ebert, Claire (University of Pittsburgh), Antonio Beardall (Northern Arizona University), Tia Watkins (University College London), Julie Hoggarth (Baylor University) and Jaime Awe (Northern Arizona University)**

[25]

*Community Building and Engagement through Maya Archaeology: Challenges, Successes, and Future Goals for the Belize Valley Archaeological Reconnaissance (BVAR) Project*

Community building through education and public outreach has been a central component of the Belize Valley Archaeological Reconnaissance (BVAR) Project since its inception over 30 years ago. One of our primary goals is to actively engage with local communities and students in archaeological heritage management in western Belize since they are the most impacted stakeholders in knowledge of the past. We highlight the challenges and successes of the BVAR Project's efforts in heritage management and public engagement, focusing on archaeological conservation, training and education, and ongoing public outreach activities. We also present new endeavors to emphasize an inclusive, collaborative framework for community-based research in the archaeology of Belize in the context of the global COVID-19 pandemic.

Ebert, Claire [43] see Hoggarth, Julie

Ebert, Claire [61] see Watkins, Tia

Eche Vega, Eduardo [182] see Cuello del Pozo, Paloma

**Eckert, Suzanne (Arizona State Museum, RPA) and Deborah Huntley (TetraTech)**

[125]

*Petrographic Analysis of Ancestral Pueblo Glaze-Painted Pottery from the Southern Rio Grande Region (Rio Abajo) in New Mexico, USA*

The Rio Grande region of New Mexico, USA, has a long tradition of understanding ceramic technology and provenance through petrographic analyses. Despite this, the Rio Abajo subregion continues to lag somewhat behind the more detailed analyses from the central and northern Rio Grande. This study presents an investigation of the production of Rio Grande glaze-painted ware over an almost 400-year period along the Rio Abajo. Tempering material, firing technology, and possible expediency are considered over time and space. While all petrofabric groups are consistent with tempers and pastes previously described, this study provides a more detailed analysis of production and firing technology than previously presented. All told, potters of the Rio Abajo had a shared practice of production that continued into colonial times and was distinct from production in other areas along the Rio Grande.

Eckert, Suzanne [183] see MacFarland, Kathryn

Edington, Hanah [40] see Hansen, Nicolas

**Edmonds, Emily (University of Nevada, Las Vegas) and Debra Martin (University of Nevada, Las Vegas)**

[26]

*Life in the Cliffs: Analysis of Health and Trauma in Ancestral Puebloan Populations from Mesa Verde*

The cliff dwellings in Mesa Verde National Park have been studied extensively by archaeologists, primarily with respect to understanding living conditions in the region prior to the widespread depopulation in the thirteenth century. There are far fewer bioarchaeological studies based on the analysis of human remains. This study incorporates data on demography, disease, and trauma from burials analyzed as part of NAGPRA compliance in the early 1990s. Burials came from larger sites on Wetherill Mesa that date to AD 900–1300. Health deterioration after the transition from mesa-top pueblos to cliff dwellings around AD 1150 is evident based on increased frequencies of two disease markers, cribra orbitalia and periosteal reaction. While trauma decreased during Pueblo III for males, females experienced increased frequencies of cranial and post-cranial trauma. Increased female trauma and a male-skewed sex ratio indicate raiding for women in the region. Perimortem trauma (occurring around the time of death and likely lethal) increased during Pueblo III, specifically at Long House, where multiple individuals exhibited spiral fractures, burning, and post-mortem scattering of body parts. These trends in health and trauma prior to depopulation provide important corroborating evidence of the troubled times that preceded mass migration out of the region.

Edmonds, Mackenzie [10] see Wells, Joshua

Edwards, Ben [97] see Griffiths, Seren

**Edwards, Nicolette (Southern Methodist University)**

[170]

*Exploitation of Canarium versus African Oil Palm by Ancient Hunter-Gatherers in Tropical Africa*

Numerous oleaginous (oil-producing) tree species exist across tropical Africa. Indigenous populations both past and present used many of these species in a variety of ways including for fuel, cooking, medicinal, and cosmetic purposes. Current emphasis in the literature is often placed on the importance of *E. guineensis* (African oil palm) likely due to it being a highly productive and economically important crop today. Here, however, we investigate the importance and exploitation of the lesser known *C. schweinfurthii* (canarium or African elemi) by hunter-gatherers as a resource in ancient contexts and compare oil exploitation between these two important sources. Indigenous use of African oil palm in this region became notably apparent the past 5000 years; however, evidence for the use of canarium dates to 11,000 years ago. While this disparity of use across time potentially resulted from differential distribution on the landscape, it may also result from possible technological constraints that existed for early hunter-gatherer populations. This paper provides a reconsideration of the importance of canarium and its role in ancient hunter-gatherer dietary and social practices in tropical Africa as well as a comparison between this often-overlooked source of oil and African oil palm.

**Edwards, Richard (UW-Milwaukee) and Robert Jeske (UW-Milwaukee)**

[105]

*Social Relationships and Connections from the Mississippi Valley to the Great Lakes during the Eleventh to Fifteenth Centuries*

"Mississippianization" has been used by archaeologists to explain the appearance of shell-temper and certain decorative ceramic motifs found in the northern Prairie Peninsula during and after the eleventh century. These ceramic attributes are supposed symbols of an expanding Cahokian worldview, sent north by a diffusionist wave of Cahokian ideas. Alternatively, migration and/or missionization from the south fueled conversion to a Cahokia-centric lifeway. But such unidirectional models remove agency from non-Cahokian peoples, and data indicate that cultural change occurred discontinuously and divergently across the Prairie Peninsula ca. AD 1000–1400. Some traits thought to exemplify Cahokian ideas appear to have occurred concurrently in the American Bottom and the Great Lakes. Outside of the Mississippi trench, Cahokia-related artifacts are rare finds north of the Central Illinois valley. The singular Middle Mississippian occupation of the north, Aztalan was isolated, short-lived, and violently terminated, belying the notion of a unidirectional wave of influence across cultural boundaries. The shift in Great Lakes region material culture ca. AD 1050–1100 is likely tied to a pan-regional shift in ideology entrained to subsistence and settlement shifts that resulted in regionally diverse expressions due to local histories, environments, and social networks.

[105]

*Chair*

Eeckhout, Peter [72] see Erauw, Céline

Eerkens, Jelmer [7] see Hull, Bryna

**Effingham, Joseph (Idaho State University) and Samantha Blatt (Idaho State University)**

[18]

*Dental Morphology of the Prehistoric Chamorro, Guam*

Dental morphology has a long history of use in understanding the biological distance and migrations of past populations. Though distribution of the frequencies of morphological traits of teeth has been documented around the world, variation within Micronesia is the least studied among the peoples of the Pacific, leaving peopling of the region the least understood. This project records dental morphological traits from a collection of dental casts of pre-Spanish Chamorro remains from Guam in order to document the peopling of Micronesia through their affinity to other known groups. A collection of 57 casts were scored for 21 non-metric traits of dental crowns using rASUDAS protocols and software. Frequencies of traits were compared to other C.G. Turner II datasets, and diversity of traits within this sample was compiled. Higher frequencies of Carabelli's cusp, protostylids, deflecting wrinkles, and cusp 7 were observed than expected. However, Chamorro affinity is consistent with Sundadonty of East Malay Archipelago and Ainu, but

their relationship to Philippine or Taiwan samples remains debatable. As knowledge of the dental morphology of living and prehistoric Micronesians increases, the population history of the Pacific and its role in understanding world-wide patterns of migration will be clarified.

**Égüez, Natalia (University of La Laguna, Spain), Jean-Luc Houle (Western Kentucky University), Oula Seitsonen (University of Oulu) and Jamsranjav Bayarsaikhan (National Museum of Mongolia)**

[93]

*Herbivore Dung Biomarkers: A Reference Collection for the Archaeology of Pastoral Domestic Spaces in Western and Central Mongolia*

Lipid biomarkers such as alkanes, fatty acids, and steroids together with their stable carbon and hydrogen isotope ratios are nowadays leading proxies for the identification of past climate variability, human activities, and animal presence in a site. These can be extracted from modern feces, desiccated dung, and soil sediments. When applied to geoarchaeological contexts, these indicators reveal significant insights on past animal diet, use of space, and paleoenvironment. This paper presents lipid analysis of dung pellets from five livestock species (i.e., goat, sheep, cattle, yak, and horse) retrieved from modern contexts, as means for reference collection for the better characterization of archaeological pastoral domestic deposits. Dung molecular fingerprints are compared to archaeological sediments and well-preserved excrement pellets recovered from winter campsites located in Uvs and Arkhangai provinces. Results suggest that husbandry management and local steppe paleoenvironments can be tracked down through the characterization of herbivore fecal matter. We argue that mass spectrometry methods when applied to pastoral households can help unveil the complexity of pastoral production systems in Mongolia and Central Asia. The research is part of the Western Mongolia Archaeology Project (WKU and Mongolia National Museum) and has been carried out at the AMBI Lab, University of La Laguna.

Égüez, Natalia [174] see Sanz Borràs, Montserrat

**Eichner, Katrina (University of Idaho)**

[190]

*Moderator*

[190]

*Discussant*

Eiselt, Sunday [74] see Etter, Bonnie

Eisenhofer, Raphael [83] see Weyrich, Laura

**Ek, Jerald (Western Washington University)**

[177]

*Imported Imperialism: The Impact, Aftermath, and Lasting Political Legacy of Teotihuacan in the Maya Lowlands*

The nature of Teotihuacan influence in the Maya Area has been a topic of enduring controversy. A growing corpus of evidence indicates direct political intervention by Teotihuacan across the Maya Lowlands starting in 378 CE facilitated through links with the Mutal Dynasty of Tikal. Emulation was not limited to material culture and political symbols but included new forms of political interaction and the first clear evidence of expansionist foreign policy. However, there has been far less emphasis on the geopolitical impacts of the withdrawal of this western empire in the Maya Area. The decline of Teotihuacan as a major power instigated hegemonic wars, with an emergent dynasty with indigenous roots—the Kanu'l dynasty—rising to geopolitical prominence. Yet, this new order was built on structures likely introduced from the west, which would be reproduced, modified, and perpetuated by kingdoms up to five centuries after the end of direct Teotihuacan activity in the region. The central thesis of this paper is that general historical trends in the Maya Area emerging from synthesis of local dynastic histories were embedded within broader pan-Mesoamerican geopolitical dynamics, including the rise and fall of Teotihuacan.

**Eklblom, Anneli (Uppsala University) and Michel Notelid (Uppsala University)**

[124]

*Archaeology, Local History, and Heritage in Limpopo National Park*

Over a period of several years (from 2003 to 2018), we carried out interviews on local history in combination with archaeological surveys, vegetation studies, and livelihood assessments in several villages in Limpopo National Park (LNP), southern Mozambique. We present the results of the archaeological recognizance of the area in terms of long term ecology and social and political changes in the region. We also present the results of our collaborative work with local residents, in particular village elders to map the history of the different lineages in the area and the documentation of oral history. We problematize the differential ways of reading and being in the landscape between the archaeologists and the residents. Lastly, we discuss the role of heritage sites in the area and in particular the negotiation of heritage and authority in the context of physical displacement of communities in the context of conservation, contrasting and comparing with historical and contemporary displacements across the border.

**Eldredge, Kaitlyn (National Center for Preservation Technology and Training) and Mary Striegel (National Center for Preservation Technology and Training)**

[46]

*Orange Skies Bring Red Rain: Understanding the Effects of Wildland Fire Chemicals to Cultural Resources*

As of the year 2000, the total acreage burned by wildfire in the United States has more than doubled that of the previous 20-year period. Though fire poses a considerable threat to archaeological sites and other cultural resources, fire suppression actions have also proven to be damaging. Three classes of wildland fire chemicals are used in wildfire suppression, each with their own unique chemical structure and method of application. This paper presents new information on the specific chemical and physical relationships between four wildland fire chemical products and four cultural materials. Adobe, low-fired brick, ponderosa pine, and calcareous sandstone represent precontact and historic building materials found within many western and southwestern National Parks. The data presented here will inform parties responsible for heritage management of the consequences of using these chemicals. As the first phase of a two-part study by the National Park Service, this knowledge is crucial to the preservation of cultural resources impacted by wildfire.

**Elgart, Alison (Florida Gulf Coast University) and Heather Walsh-Haney (Florida Gulf Coast University)**

[38]

*In Search of MIA from One Fateful Day in 1943: Florida Gulf Coast University Partners with the Defense POW/MIA Accounting Agency (DPAA) to Bring Servicemen Home*

Florida Gulf Coast University (FGCU) recently formed a partnership with the Defense POW/MIA Accounting Agency (DPAA). In June 2019, FGCU participated in its first mission, the investigation of a World War II aircraft crash in Germany. For FGCU, this was the culmination of several initial endeavors. It was the first joint effort between the Departments of Justice Studies and Social Sciences. Undergraduate students from the Anthropology Program with archaeological experience and graduate students in forensic anthropology participated. Our crew of 10 students, two professors, a forensics lab manager, a CRM archaeologist, a linguist, a DPAA EOD, and an Air Force medic worked together very efficiently. Our methods included traditional archaeological and forensic archaeology techniques, with an emphasis on metal detection. Our team was the first to excavate this crash site. Although we had the whole team on site for only about three weeks, we excavated 20 4 x 4 m units and investigated three possible bomb or impact craters within the site. We identified many screenfuls of small pieces of aircraft wreckage and collected possible material evidence. Some of this evidence may correlate the site with the plane. Our debriefing with the DPAA indicated our mission was successful.

Elliot, Richard [38] see Monaghan, John

**Elliott, Michelle (Université Paris 1 Panthéon-Sorbonne) and Yoanna Herrera-Santos (Université Paris 1 Panthéon-Sorbonne)**

[177]

*Reconstructing Land-Use and Socio-environmental Change at Epiclassic Chicoloapan Using Plant Macroremain Analyses*

The site of Chicoloapan Viejo represents a long-term occupation that spanned multiple cultural phases, each associated with changes in population size, settlement pattern, and sociopolitical organization. These changes were also accompanied by climatic fluctuations of varying intensity. This socio-environmental evolution through time would have thus necessitated adaptability in subsistence and resource management strategies, which in turn would have produced significant impacts on the landscape in and around the site. In this paper, we present the results of paleoethnobotanical analyses of seed and charcoal remains from several Epiclassic excavation contexts at Chicoloapan. These include potential agricultural zones and various domestic areas associated with both elite and commoner households. Through comparisons among these contexts, we are able to create an inventory of the wild and domesticated plant resources that were used at Epiclassic Chicoloapan and to infer the range of ecological and anthropic zones that were present at this time. We are also able to identify certain practices of plant collection and cultivation, as well as to explore how these activities may have differed throughout the site and according to households' socioeconomic status.

[177]

Chair

**Ellis, Olivia (University of Arizona), John Walden (University of Pittsburgh), Victoria Izzo (Texas A&M University), Kirsten Green Mink (University of Montana) and Jaime Awe (Northern Arizona University)**

[23]

*A Diachronic Analysis of Gender Based Mortuary Practices in the Belize River Valley*

Burial practices can offer important insights into gender roles within ancient Maya society. We present the results of a diachronic analysis of osteology, grave goods, burial architecture, and contextual data from 108 burials from the Belize River Valley polities of Baking Pot, Blackman Eddy, Cahal Pech, Lower Barton Creek, and Lower Dover. Analyses of grave assemblages intersect with the biological sex of individual to provide an understanding of how gender roles were socially constructed. Diachronic examination of these patterns, from the Preclassic through Terminal Classic periods, in relation to burial wealth and sociopolitical status allow for the reconstruction of shifting patterns of gender inequalities at multiple hierarchical levels of society over time. Our results provide a picture of the construction of identities and gender inequalities in multiple Classic Maya polities over a long temporal span. The analysis shows how that shifts in gender inequalities can occur over relatively limited spatial and temporal scales.

Ellis, Olivia [67] see Izzo, Victoria

Elston, Robert [39] see Allgaier, Paul



Elston, Robert [95] see Vernon, Kenneth

**Emery, Kitty (Florida Museum, University of Florida), Antonia Foias (Williams College), Elizabeth Webb (University of Western Ontario), Lisa Duffy (Florida Museum, University of Florida) and Sophie Reilly (McMaster University)**  
[136]

*Chocolate, Manioc, and Maize: Kante't'u'ul and Chachaklu'um in Motul de San José's Realm*

Between 2013 and 2015, the Periphery of Motul de San José Archaeological Project conducted fieldwork at two subsidiary sites, Kante't'u'ul and Chachaklu'um, located within 5 km of Motul de San José, the primary Late Classic center in this zone along the northern shore of Lake Peten Itza. Paleoethnobotanical and chemical residue analyses have highlighted the variety of resources exploited by the residents of these sites, from cacao orchards to corn infield gardens to root crop cultivation. These resources may have moved between sites, and especially from the subsidiary sites to Motul via two means (minimally): market exchange or tribute payments. The spatial distribution of these resources at the three sites provides hints to the economic integration of the polity, whether through either or both means of movement of goods. In his most recent work, *Against the Grain*, Scott (2017) argues that rising political elites relied on seed grains like maize to expand their taxation, but discouraged root crops because the latter were not easily found and counted, nor light for transport or easily storable. The implications of Scott's ideas for the evidence from Motul and its periphery will be explored.

Emery, Kitty [72] see Praet, Estelle

**Engen, Danica (University of Manitoba), Thomas Doran (University of Manitoba) and Alex Monin (University of Manitoba)**  
[33]

*More Than Just Pretty Things: Taphonomic and Behavioral Observations from the Unworked Ostrich Eggshell Assemblage Recovered from Grassridge Rockshelter, South Africa*

Grassridge Rockshelter demonstrates one of the largest assemblages of ostrich eggshell beads and preforms in southern Africa that dates to the mid-Holocene. The site, located in the interior of the Eastern Cape of South Africa, therefore reflects an intensive use of ostrich eggshell as a raw material source for the production of decorative jewelry and clothing. Unworked ostrich eggshell from archaeological contexts, however, has been frequently overlooked, with the majority of studies focusing only on counts and weights. Here, we present preliminary results from a more detailed approach to studying unworked ostrich eggshell that includes counts and weights, as well as fragment size, burning, shape, and spatial location within the site. These data provide novel insights into the use and discard of ostrich eggshell at the site, as well as insights into the taphonomic processes that contributed to the site's formation, specifically the impact of repeated hearth construction and burning.

**Englehardt, Joshua (El Colegio de Michoacán) and Michael Carrasco (Florida State University)**  
[107]

*The Tenaxpi Egg: Ecology, Representation, and Conceptual Convergence in Olmec Art*

Through the lens of "conceptual convergence," we examine the multiple symbolic strands that inform specific Gulf Coast sculptural images, focusing especially on the Tenaxpi Egg/Homshuk sculpture. This sculpture, excavated on Tenaxpi Island in Lake Catemaco, shows a figure sculpted on an egg-shaped stone. This image likely references several stories from the region in which an old couple find an egg from which a boy emerges. Among the Zoque Popoluca of the Tuxtla Mountains of southern Veracruz, the boy is named Sintiopiltin, "god-ear-of-corn." This deity is the source and therefore precursor to actual maize, while at the same time being maize himself. After introducing this object, we examine the complex references that this image possibly presents. Specifically, we suggest that while maize is an important symbolic element, other metaphors drawn from diverse ecological systems played an equally significant role in this specific case, and in other Gulf Coast imagery. Through this example, we consider the fluidity of conflated or shared attributes within Indigenous thought, in which myth, history, ideology, agriculture, and the environment are interwoven. We critically engage this framework by exploring theoretical and methodological issues associated with emic and etic conceptualizations of Formative period artistic programs.

**Ensley, Ross (Terra Geo Solutions), Richard Hansen (University of Utah), Carlos Morales-Aguilar (Université Paris 1 Panthéon-Sorbonne) and Josephine Thompson (Mirador Basin Project/FARES)**  
[48]

*Landscape of the Mirador-Calakmul Karst Basin*

The southern Petén Plateau can be subdivided into four karst landscapes, each with a dominant karst landform. They are fluviokarst, polygonal karst, karst margin plain, and upland karst. These terrains have different proportions of uplands and low standing wetlands. Within this framework lies the Mirador-Calakmul Karst Basin (MCKB). A karst drainage basin is the combined surface area and subsurface drainage that contributes water to a conduit network and its outlet springs. Six key hydrologic features characterize the basin, including seasonal swamps, dolines, intermittent lakes, a lack of perennial streams, subsurface conduits, and springs. We infer subsurface flow in the karst basin from a regional groundwater map, compiled from over 4,000 surface hydrologic features covering the southern plateau and its surrounding lowlands. Comprised of the Mirador and Calakmul watersheds, the basin is bounded on the east by the Mirador Anticline, on the north by a drainage divide with the Desempeño watershed, and on the west by a line of low hills punctuated by karst valleys. We suggest that the wetland characteristics of the MCKB made it a favorable landscape for cultural development of the ancient Maya during the Preclassic period due to the wide range of resources present.

Ensley, Ross [48] see Thompson, Josephine

**Ensor, Bradley (Eastern Michigan University)****[67]***The Not Very Patriloc European Neolithic*

Two decades of strontium isotope and aDNA research on Central European Neolithic cemetery populations have consistently interpreted patrilocality, which is now a foregone conclusion. This paper questions those interpretations from a social anthropological perspective. Models are presented for interpreting strontium isotope ratios and aDNA that consider the intersections of descent, residence, and postmortem location. The reassessment of published data from Linderbandkeramik settlements and mass graves suggest widespread bilocality and bilateral descent. Some cases exhibit matriloc/uxorilocal biases and others patriloc/virilocal biases. Empirical archaeological kinship analyses independently confirm bilateral descent. Rather than the anticipated ubiquitous bilocal residential groups, various residential practices were negotiated within each occupation phase of each settlement examined. Bilocal, matriloc, neolocal, semi-matriloc, and semi-patriloc groups were all common. Groups changed intergenerational strategies. No patriloc groups are detected. From a social anthropological perspective, Neolithic Central European kinship was flexible, fluid, and decidedly not patriloc.

Enzmann, Jonas [98] see Segschneider, Martin

**Eppich, Keith (TJC- the College of East Texas)****[152]***Drums in the Deep: Archaeological Context and Contemporary Acoustics of Ceramic Drums Recovered from Late Classic El Perú-Waka', Guatemala*

Ceramic drums appear in Classic Maya art, being carried in the hand or nestled between the legs of Native American musicians. However, they have received scant, if quite detailed, attention in the scholarly literature. This presentation seeks to expand our knowledge of these ancient musician instruments using a number of complete and partial drums recovered from the ruined city of El Perú-Waka'. Located in the northwest of Guatemala, El Perú-Waka' existed for the 13 centuries of Classic Maya civilizations with an exceptional and vibrant potting tradition. Cylindric ceramic drums were one of the products of this potting tradition. Archaeologically, such vessels seem associated with large offerings or feasting contexts, sharing context with ocarinas and polychrome serving ware. This presentation examines the form, construction, and surface treatment of such vessels together with their contextual association. Furthermore, it examines the potential sounds that ancient musicians would have produced on such vessels, especially as ceramic drums produce different notes than wooden ones. Lastly, the paper places the drums in their sociocultural context within the past, attempting a partial explanation for their form, function, usage, archaeological context, and acoustics.

**Eppich, Keith (TJC- the College of East Texas)****[188]***Discussant***Erauw, Céline (Université libre de Bruxelles), Fabienne Pigière (University College Dublin) and Peter Eeckhout (Université libre de Bruxelles)****[72]***The Multiple Uses of Animals in the Ritual Site of Pachacamac, Peru: Results from a Recent Archaeozoological Analysis*

Pachacamac is a major site of the Peruvian central coast, occupied from the fifth to the sixteenth century AD. This presentation will report the results of an ongoing analysis of faunal remains recovered during the 2014, 2016, and 2018 excavation campaigns within the framework of the Ychsma Project (Université libre de Bruxelles). The different buildings excavated, named B3, B4, B15, and E3, are located in the second precinct of the site. They all differ from the well-known Pyramids with Ramps. Among the considerable amount of material studied, several complete animals in a very good state of preservation were discovered. Our study focuses on the last two periods of occupation before the Spanish conquest, namely the Ychsma and Inca periods, highlighting the differences between these and the selection of animals according to their use. It provides preliminary insights into the practice of sacrifice and offerings of animals at the site of Pachacamac, the diet of the inhabitants, and breeding practices, all these topics being the subject of a limited number of studies and therefore not yet well documented for the central coast of Peru.

Ergun, Müge [31] see Ugras, Funda

**Ermish, Brendan and Shannon Boomgarden****[41]***Maize: Phenotypic Response to Variable Depth Water Input*

Prehistoric maize farming has been well-documented in Range Creek Canyon, Utah. Evidence includes numerous corn cobs, maize storage structures, starch on ground stone tools, and pollen and isotopic evidence from sediment cores. Maize farming experiments in Range Creek suggest dry farming would not have been a sustainable option for the Fremont. With access to a permanent water source, irrigation farming would have been the most effective method of delivering controlled amounts of water to their crops, and thus allow for improved yields. Ongoing experiments in Range Creek seek to understand the efficiency in timing and amount of water necessary to produce the highest yields despite the costs associated with irrigation. Pivotal to understanding this trade-off is documenting root depth of dry adapted maize varieties under varying irrigation regimes. With limited water, should the Fremont water deeply less often or shallow more often? To document variability in root growth, an experiment was conducted to document the roots of Pima 60-Day Maize. By watering three separate bins at different depths, we were able to measure phenotypic response in root length as a function of the depth at which the water is provided.

Ermish, Brendan [41] see Boomgarden, Shannon  
 Ermish, Brendan [41] see Muller, Jordin

**Eschbach, Krista (Arizona State University) and John Worth (University of West Florida)**

**[169]**

*Ceramics, Categorical Identification, and the Changing Social Structure of the Spanish American Colonies*

Archaeologists frequently have used distinct decorative styles, often found on serving vessels, as indicators of social identity and status. For the Spanish American colonies, focus has been placed on tableware, particularly majolica, as a measure of economic status and socio-racial identity, linked to Spanish-European commensality. Growing research throughout Latin America has demonstrated wide variability in the distribution of majolica tableware that challenges simplistic interpretations. Geographic location, settlement function, and transformations in the colonial social structure all contributed to diverse patterns in ceramic distribution. In this paper, we examine diachronic variation across three centuries and two geographic locations within the Spanish American empire: Port of Veracruz and Northwest Florida. Historians have documented at least three large-scale shifts in the organization of colonial society, from the *géneros de gente* (types of people)—based on categorical distinctions borrowed from Iberia—to the more well-studied caste system and, finally, to incipient economic classes. Through an examination of assemblages from Veracruz and Florida, we critically evaluate the changing role of majolica as a symbol of categorical distinction in colonial Mesoamerica and the borderlands.

**[169]**

*Chair*

**Esdale, Julie (Colorado State University, CEMML) and Kelly Graf (Texas A&M University)**

**[34]**

*Spatial Arrangement of the Northern Archaic Component at the McDonald Creek Site, Central Alaska*

McDonald Creek is a multicomponent campsite located in the central Tanana Valley south of Fairbanks, Alaska. In addition to late Pleistocene components, archaeological excavations at the site have uncovered a productive Northern Archaic occupation dating to the middle Holocene. A technological analysis of the lithic assemblage has delineated specific tool production areas across the site. Late stage bifacial tools of different raw materials were resharpened in discrete areas. Notably, microblade core reduction debris of the same materials was also found in the individual debitage clusters. This indicates that multiple technologies were concurrent at the scale of single behavioral events. Site activities were repetitive and represent only a small range of behavior over a short visit. The middle Holocene component at the site is very different than earlier occupations which exhibit longer term habitation and subsistence activities.

**[34]**

*Chair*

Esdale, Julie [34] see Graf, Kelly

Esdale, Julie [34] see Henry, Aureade

**Esh, Kelley (DPAA), Allison Campo (DPAA), Kimberly Maeyama (DPAA) and Anthony Hewitt (DPAA)**

**[29]**

*A Bird's-Eye View: Utilizing Wartime Aerial Imagery to Recover the Remains of a US Service Member from the Vietnam War*

The Defense POW/MIA Accounting Agency (DPAA) is responsible for the recovery and identification of missing US service members from past conflicts, including the Vietnam War. This case study involves over 25 years of investigation efforts that led to the recovery of an O-1 Bird Dog pilot shot down over Laos in 1967. The long investigative history for this case focused heavily on witness testimony, which indicated that the pilot had exited the plane before impact and was buried in a shallow grave by enemy forces. However, survey efforts at alleged burial locations failed to recover the remains of the pilot. Finally, in 2018, a possible impact scar location from wartime aerial imagery was archaeologically surveyed and a possible aircraft crash site was located. Block excavation operations at the crash site later recovered possible human remains, identification media, and material evidence consistent with a US loss. While DPAA was able to conduct a successful recovery in this case, more than 1,500 service members from the Vietnam War are still missing. This poster highlights the need for investigators to develop multiple lines of evidence and take a big picture (bird's-eye) view, rather than bird-dogging a single line of inquiry.

**Espino Huaman, Richard (Universidad Nacional San Luis Gonzaga de Ica), Jo Osborn (University of Michigan), Camille Weinberg (University of Texas, Austin) and Brittany Hundman (Direct AMS)**

**[128]**

*Caminos entre los valles de Chincha y Cañete: Un acercamiento hacia las conexiones de nuestros antepasados prehispánicos en el Perú*

En los últimos años, investigaciones arqueológicas en los valles de Cañete y Chincha han avanzado nuestro conocimiento de estas regiones, sus sociedades, y sus transformaciones durante el Intermedio Tardío y el Horizonte Tardío. Sin embargo, aunque queda claro que había conexiones fuertes entre las culturas Huaco y Chincha, falta definir cómo eran las conexiones entre ambas culturas. En esta ponencia, exploramos sus conexiones y las evidencias dejadas a través del tiempo la cual surgen varias interrogantes. ¿Cómo se movía la gente entre los valles de Cañete y Chincha? y ¿cuál era la ruta que seguían? De acuerdo a nuestros datos trataremos de dar respuestas a nuestras interrogantes y generar un mejor conocimiento de las conexiones viales entre estas regiones, lo cual nos permitirá avanzar nuestros estudios sobre las conexiones sociales, económicos y políticos de los Huarco y Chincha.

Espino Huaman, Richard [128] see Osborn, Jo

**Espinosa, Alicia (Université Paris 1 Panthéon-Sorbonne) and Isabelle Druc (University of Wisconsin, Madison)****[125]***Retracing the Relations between Virú-Gallinazo Communities, Early Intermediate Period, Northern Coast of Peru: Recent Contributions from Ceramic Technology and Petrography*

Until recently, it was thought that during the Early Intermediate period on the northern coast of Peru, the Virú-Gallinazo populations only coexisted for a short time with the Mochicas. Recent archaeological operations in the Virú Valley now reveal that in this region they developed without interruption from 200 BC to AD 700. Nevertheless, the relationship between this core zone and the Virú-Gallinazo communities settled in the adjacent valleys is still poorly known. The comparative technological analysis of the ceramic recovered in Virú-Gallinazo contexts from the Virú, Moche, Chicama, and Lambayeque valleys provides new insights on this matter. The aim of this research is to identify all the steps of the operative chain, by combining the analysis of marks left by potters, visible on surfaces and sections, and the petrographic analysis of paste. The results demonstrate how these groups are embedded in the same learning networks, and thus belong to the same community of practice. They also show how these populations, by settling in different regions, have preserved their traditions while adapting certain practices. In particular, we discuss how potters have modified their strategies for acquiring raw materials and adopted new practices through contact with contemporary groups in their new region.

**Espinosa, Samantha and Blanca Iveth Castañeda Espinoza****[63]***Aproximaciones a la estratigrafía y la fauna marina durante el pleistoceno en el sur de la base aérea de Santa Lucía*

En el sur de la base aérea de Santa Lucía se ha detectado fauna marina, específicamente restos óseos de peces, gasterópodos, caracol univalvo de agua dulce llamado *Physa acuta*, o *Physella acuta*, los cuales se han encontrado en arcillas y arenas, este presente trabajo será una aproximación a la zona marina del pleistoceno en la cuenca de México, lago de Xaltocan y la estratigrafía de la zona.

Espinosa, Silvana Laura [6] see Belardi, Juan

**Espinoza Sánchez, Marco Antonio and Aracely Yañez Nieto****[63]***Levantamiento de nube de puntos aplicado a contextos paleontológicos*

En el marco del proyecto de salvamento arqueológico del nuevo aeropuerto Santa Lucía, México se han descubierto una gran cantidad de restos paleontológicos del pleistoceno tardío entre los cuales destaca la presencia del mamut columbi. Este descubrimiento nos otorga un nuevo panorama sobre el paleoambiente durante el pleistoceno tardío, en algunas unidades de excavación se aplicaron diversas técnicas arqueométricas para el estudio minucioso de la deposición de los restos óseos. Una de estas técnicas es el levantamiento de nube de puntos en 3D, esta herramienta sirvió para realizar un meticuloso registro gráfico con ayuda de la tecnología, este instrumento permite congelar el contexto de excavación en un modelo que nos permite observar, analizar y registrar los elementos paleontológicos a la vez que se continúa la liberación de la excavación; además hará viable a futuro analizar con mayor precisión, realizar interpretaciones e identificar los procesos tafonomicos a los que pudo estar expuesto.

Esteban, Irene [151] see Fisher, Erich

Estrada, Javier [104] see Arroyo, Barbara

**Estrada-Belli, Francisco (Tulane University) and Sandra Balanzario (C-INAH Q. Roo)****[76]***Dzibanché: The Capital of the Kaanul (Snake) Kingdom Seen through Lidar*

Dzibanché is an archaeological zone in southern Quintana Roo encompassing several large ceremonial complexes—Dzibanché, Tutil, Kinichna, and Lamay—connected by causeways. According to contemporary texts, it was the early capital of the Kaanul (Snake) kingdom with vast hegemonic influence across the Classic Maya Lowlands. Ichkabal is a large Preclassic ceremonial center located 11 km northeast of Dzibanché. These sites are central to ongoing debates regarding the place of origin of the Snake dynasty and the nature of its political influence beyond southern Quintana Roo. Here we present the preliminary results of a lidar survey over Dzibanché, Ichkabal, and neighboring areas. The new data reveal several new features including extensive residential and agricultural areas, several new causeways, and outer ceremonial complexes. These data suggest a greater development of monumental architecture in the Dzibanché zone than previously known and a high degree of integration between urban zones (Dzibanché), rural zones, and outer ceremonial centers (e.g., Ichkabal) since the Preclassic period.

**[76]***Chair*

Estrada-Belli, Francisco [76] see Tokovinine, Alexandre

Ethier, Jonathan [93] see Piezonka, Henny

**Etter, Bonnie (Southern Methodist University), Robert Selden Jr. (Stephen F. Austin University) and Sunday Eiselt (Southern Methodist University)**

[74]

*The Toyah Phase Paradox: In Three Dimensions*

The Toyah Phase has been the subject of debate since J. Charles Kelly first defined it in 1947. Known widely as the Toyah Phase Paradox, research has struggled to reconcile the homogenous expression of this protohistoric to historic archaeological record in central Texas and the high levels of ethnic diversity witnessed by French and Spanish explorers at the turn of the eighteenth century. Recent studies have related geographic and temporal variation in artifact styles to “communities of practice” using standard 2D measurement techniques, with varying degrees of success. We build on this research by using a 3D geometric morphometric approach to examine 26 Perdiz projectile points, a hallmark of Toyah assemblages. These points were recovered from two contemporaneous sites located some 100 miles apart in the core area of Toyah Phase settlement. The primary goal of the study is to explore whether 3D imaging can identify localized variants of Perdiz points based on shape. This work, in turn, may be used to infer patterns of interaction between village clusters through network analyses at the regional scale. Implications for how cultural plurality in central Texas may have influenced Spanish missionization are discussed.

**Eusebio, Michelle (University of the Philippines-Diliman)**

[156]

*Experiencing Foodways and Community in Southeast Asian Archaeology*

The cultural aspects of science and technology—the science, culture, and art in everyday life—can be demonstrated through food and foodways. Foodways is the *chaîne opératoire* of what happens to food and associated materials from their acquisition until their discard. It is also a series of cultural formation processes, where there are resulting food and material culture remains from every step. From the past to the present, many of the foodway activities are being done as a community. Present-day cultural diversity and identity revolve around cuisine, which comprises the preparation and consumption of food. However, most of the studies in Southeast Asian archaeology are geared toward addressing food acquisition practices or subsistence strategies associated with other big picture questions (e.g., environments, migrations, and foraging-farming transition). As a result, it is not clear how food items were prepared and served that would allow for evaluating the importance of food in maintaining identity based on shared foodways. To address how foodways and being part of a community were possibly experienced by the people in ancient Southeast Asia, the perspectives of practice theory and community of practice are being advocated to get closer to their identities and daily lives.

**Evans, Amanda (Gray & Pape Inc.), Louise Tizzard (Wessex Archaeology Ltd.), Megan Metcalfe (Wessex Archaeology Ltd.) and Alexandra Herrera-Schneider (Coastal Environments Inc.)**

[98]

*White Caps and Laptops: Results from the 2019 and 2020 Surveys of Submerged Precontact Landscapes in the Northwestern Gulf of Mexico*

Sea level rise models since the last glacial maximum demonstrate that the North American landmass available for precontact human habitation was larger than at present. In the northwestern Gulf of Mexico, less than 1 m<sup>2</sup> of the continental shelf has been sampled and tested archaeologically. Out of 106 sediment cores acquired for archaeology, two have identified preserved landscape elements of interest: a probable rangia shell midden and a charcoal horizon. Both cores were collected in modern water depths of 17 m BSL, and both returned radiocarbon dates of approximately 8500 yrs BP. The two cores are 48 miles apart from one another, but in between the two locations, along the shoreline, are known archaeological sites dating to the same time period. Using the two locations and the modern shoreline, geophysical survey including both chirp sub-bottom and parametric sonar was conducted at targeted areas, resulting in over 650 line-km of survey. This paper will present the survey design and preliminary results from the geophysical remote-sensing survey cruise in May and June 2019. The authors will further present the testing design and preliminary results from vibracore conducted in June 2020.

[98]

*Chair*

**Evans, Susan (Penn State University)**

[30]

*Pathways to Power: The Aztec Empire in Six Emperors and Seven Maps*

Beginning in about 1430 and ending in 1519—merely 90 years—the Aztec Empire expanded from the Basin of Mexico in the Central Highlands to the Pacific coast plain and Gulf of Mexico lowlands, securing luxury goods and tributes in goods and labor from about five million people over several hundred thousand km<sup>2</sup>.

Everardo-Martínez, Paola [55] see Contreras-Sieck, Miguel

**Evoy, Angela (Cosumnes River College)**

[93]

*Neolithic Resource Use and Adaptation in the Eastern Gobi Desert: A Functional Analysis of Axes and Adzes*

Flaked and ground stone axes and adzes first appeared in the eastern Gobi Desert at 8.0 cal BP and were incorporated into the technological package. At the same time, changes in local ecological conditions reflect a transition from continuous grass/shrub-steppe across the Mongolian Plateau to the development of dispersed patches of dune-field wetland oases and high-elevation forests. This study explores the adoption and function of axes and adzes in the eastern Gobi Desert and their relationship to the development of these new forested ecologies. Using an experimental and use-wear approach, I analyze 29 axes and adzes from

four sites in the eastern Gobi Desert of Mongolia and Inner Mongolia. Results indicate that axes and adzes were primarily used for woodworking but include other activities. Furthermore, the adoption and manufacture of axes and adzes represent an increasing investment in producing formal technologies as resources within these new diverse ecological patches were intensively utilized.

**Extract, Jonathan (University of California, Riverside)**

[155]

*Nomadic Charters: Mimicry and Heterotopia in the Nahua Festival of Quecholli*

Anthropological discourse has placed concerted attention on the role of "axis mundis" in configuring Mesoamerican socio-cosmology. However, in this paper, I highlight the emphasis that many Central Mexican creation-foundation narratives placed on alterity rather than centrality in rendering the boundaries of altepetl "communities." Nahua cartographic histories, in their delineation of place, often root identity in negative rather than positive terms, circumscribing a community's imaginary in terms of its ethnic Others, namely Chichimec nomadic wanderers. This rhetoric of alterity was not only transcribed in cartography, but was also performed. I highlight the Nahua festival of Quecholli as an important example of how the symbols and pedagogy of creation-foundation narratives were annually mediated. Additionally, I differentiate the festival's performance of alterity into two heuristic categories. The first is the transgression of liminal spaces or "heterotopias," such as the boundless desert wilds associated with Chichimecs. The second is the personification and confrontation of Chichimecs themselves through mimicry. In turn, I suggest that scholars should not take for granted the stability of solidarity, and that the center, both spatially and ideologically, is the perpetual consequence of negotiated boundary.

**Eyeington, Ashley**

[65]

*Geoarchaeological Approach to Resolving the Origins of Bison Bone Beds at Bonfire Shelter, 41VV218, Val Verde County, Texas*  
Bonfire Shelter is a large prehistoric rockshelter site situated at the northern end of Mile Canyon in southwest Texas. Early investigators determined the site to be the location of multiple bison jump events; however, subsequent investigations have disputed this interpretation. My research focuses on answering the questions of whether the Paleoindian bone bed represents a bison jump event, and if so, does it represent one or multiple events. Geoarchaeological methods including particle size analysis, magnetic susceptibility, and loss-on-ignition are providing insights in the formation processes of the site and as a result, insights into the origin and number of events represented within the Paleoindian bison bone bed. To date, research of this type has not been conducted to analyze the Paleoindian bone bed at Bonfire Shelter.

**Fábregas Valcarce, Ramón (University of Santiago de Compostela, Spain), Arturo de Lombera-Hermida, Marcos García-Díez, Xosé Pedro Rodríguez-Álvarez and Ramon Viñas**

[53]

*On the Margin, Marginal Too? A Western Outpost of Paleolithic Cantabrian Cave Art (NW Iberia)*

The Franco-Cantabrian group of cave art ranks among the best known examples of Paleolithic symbolic behavior. For more than a century no decorated cave was reported beyond the Nalón Valley in the center of Asturias, until the carvings and paintings from Cova Eirós were discovered. At more than 100 km from the Nalón, Eirós's art remains an isolated spot in the NW Iberian peninsula and, unlike other famous places like Altamira, the images from Eirós (horses, bovinds, and signs) have been dated in a very late stage of the Paleolithic cave art. Still, Eirós shows interesting coincidences (in stylistic and chronological terms) with other decorated sites (both caves and open-air) in the Douro Valley, sometimes hundreds of kilometers away, hinting at the existence of shared systems of symbolic expression in a moment of environmental and cultural change.

Fábregas Valcarce, Ramón [140] see de Lombera-Hermida, Arturo

**Fahey, Brian, Kelsi Stroebe (Arizona State University), Olivia Boss (Rutgers University) and Curtis Marean (Arizona State University; Nelson Mandela University)**

[40]

*Systematic Differences in Sieved and Point-Provenienced Fauna Ecofacts from PP5-6, South Africa*

In zooarchaeological analysis, there is a tendency to give point-provenienced ecofacts analytical priority over ecofacts found in sieved material. To test for the effects of this bias, we conducted a zooarchaeological and taphonomic analysis of faunal ecofacts ( $n = 841$ ) found in the 10 mm sieved material from Pinnacle Point 5-6 (PP5-6). This is a Stone Age site on the modern south coast of South Africa that has a high-resolution record of human behavior and environmental change during the Middle Stone Age. All fauna encountered and seen by excavators in excavation are point-provenienced in situ, with no omission of small-sized or unidentifiable specimens. All sediment is subsequently sieved for any material missed in excavation. The 10 mm sieved specimens were compared to the point-provenienced faunal specimens from corresponding stratigraphic levels to test for systematic differences between provenienced and sieved faunal ecofacts. This analysis shows that ignoring fauna recovered from 10 mm sieve could lead to different zooarchaeological and taphonomic site interpretations.

Fajardo Lamson, Roxanne Lois [39] see Contreras, Daniel

Fan, Wenquan [29] see Miller, Melanie

Fang, Hui [141] see Doyon, Luc

**Farace, Anthony (University of Florida)****[125]***Establishing Mississippian Potting Communities at the Wickliffe Mounds Site, Kentucky*

Pottery vessels at the Wickliffe Mounds site, a Mississippian village located in Ballard County, Kentucky, can be used as a representative sample to examine the ceramic production techniques and choices used within the Ohio-Mississippi River confluence region. This paper uses both visual and quantitative (point-counting) ceramic petrography to understand steps in the *chaîne opératoire* at Wickliffe establishing common practices and a localized method of production. Sixty sherds, of different vessel types, were analyzed visually using a polarized light microscope and quantitatively using a PETROG stepping stage and software. Utilizing a PCA constructed of the ceramic components, the paper identifies six fabric groups defined by different combinations of base clays and temper. The paper also infers technological choices taken by potters at Wickliffe Mounds, including paste preparation, formation methods, finishing and decorating methods, and firing conditions.

**Farahani, Alan (University of Nevada, Las Vegas)****[162]***Moderator***[162]***Discussant***Farahani, Alan (University of Nevada, Las Vegas) and Hanna Grossman (University of California, Los Angeles)****[195]***The Use of R Shiny and Other Open-Source Interactive Platforms in Increasing Engagement with Archaeological Research Results*

Advances in the last decade of open-source computation have improved the capability of archaeologists to store, analyze, and visualize ever-increasing amounts of data. Developments in the R and Python programming languages specifically have made once-proprietary radiocarbon calibration, stratigraphic analysis, and statistical modeling available to a wider variety of practitioners with different needs and specializations. In line with other sciences, recent publications by archaeologists have stressed the ability of these open source platforms to foster the sharing of data and code used for analyses needed for transparent and reproducible research. Nevertheless, less attention has been paid to how these same platforms may also facilitate a broader dissemination of interactive archaeological visualizations and tools in research and teaching. This paper will present three vignettes of the use of the R-based Shiny platform to generate an interactive a) regression model selection of archaeological data, b) full-featured SQL-based database use-able in the field, and c) visualization of spatial data using shape files. As opposed to concerns of putting these data back into a 'black box', each of these vignettes will be used to argue that this and analogous platforms encourage more creative engagement with research results beyond original intent than have been hitherto possible.

Farahani, Alan [29] see Robledo, Angelo

**Fargher, Lane (Centro de Investigación y de Estudios Avanzados del IPN), Marc Marino (University of Arkansas), Xochitl Bautista (Eka Jiva al Servicio de Grupos Vulnerables A.C.) and Angelica Costa (SEARCH Inc.)****[71]***Swamp People: Landscape Building in the Ciénaga de Zimatlán, Valley of Oaxaca, Mexico*

The Valle de Zimatlán, in the Central Valleys of Oaxaca, is considered to have been a key zone for agricultural production during the prehispanic era, especially within the Río Atoyac's floodplain. However, its productivity faces a major obstacle, flooding. This is because it is covered with Vertisols, which contain high concentrations of expansive clay minerals (montmorillonite). Thus, it quickly becomes saturated and impermeable during the rainy season, resulting in the formation of seasonal swamps and lakes. Information from the colonial period indicates that, devoid of human occupation, this zone was characterized by a multitude of lakes and ponds, making it unusable for cultivation. In order to bring the zone into agricultural production, collective labor mobilization was required to build deep drains. Today the area is crisscrossed by drains that are 1–3 m deep and tens to hundreds of meters long, serving to lower the water table and direct water to the Río Atoyac. Accordingly, in this paper, we use geospatial analysis of relief, pedology, modern drainage channels, and archaeological data to understand the scale, organization, and implementation of the *landesque* strategies that converted the Valle de Zimatlán into a highly productive agricultural zone during the prehispanic era.

**[71]***Chair*

Fargher, Lane [71] see Antorcha Pedemonte, Ricardo

Fargher, Lane [181] see Marino, Marc

Fargher, Lane [71] see Torales Ayala, Gabriel

**Farley, William (Southern Connecticut State University)****[103]***Hearth, Home, and Colonialism: Cultural Entanglement at Calluna Hill, a 1630s Pequot War Household*

This paper explores the nature of cultural change and continuity during the early colonial period (ca. 1615–1637), an understudied period in southern New England. The earliest years of intercultural exchange between Europeans and Native people in the region are believed to have brought sweeping disturbances to Native American lifeways; however, the nature and pace of those changes is little understood. The site of Calluna Hill (CT 59–73) is the location of a small Pequot village burned by the English during the Pequot War in 1637. The excavation of a domestic site from these earliest years after the arrival of Dutch traders and English settlers to Connecticut is exceptionally rare and offers us an opportunity to understand the complex and agentive ways that the Pequots adopted novel materials and ideas into their worldview. I use the theory of cultural entanglement to understand the direction and nature of cultural transformation in a period absent the asymmetrical power dynamics of the eighteenth and nineteenth

centuries. I examine Pequot indigenization of materials and architecture to assess the ways that Pequots maintained long-standing practices to mitigate a fast-changing colonial environment.

**Farquhar, Jennifer (University of Pittsburgh) and Arlene Rosen (University of Texas, Austin)**

[93]

*Adaptive Strategies of Foragers and Early Herders in Mongolia's Desert-Steppe: Implications for Understanding Social-ecological Dynamics, the Development of Food Production, and the Study of Long-Term Social Change*

This paper presents preliminary findings from ongoing research on the development of pastoralism in Mongolia's semiarid desert-steppe. The project involves a multiscale investigation of human-environment interactions, specifically the relationship between climate change and land use, and how adaptive strategies impacted natural and social environments during the transition from a foraging economy to herding (ca. 4000 BP). Recent archaeological excavations at the Ikh Nart Nature Reserve in southeastern Mongolia have identified several archaeological sites dating to this important economic transition. Ongoing geoarchaeological work contextualizes these finds, revealing evidence for increased aridification and decimation of wetlands during this economic shift. Future analyses will focus on defining the relationship between climate change and human impacts on the landscape. These data will be combined with recent landscape level investigations to assess settlement mobility prior to, during, and after this transition as a way to understand adaptive strategies of foragers and early herders, including differences in how, when, and why people moved, illuminating how people made decisions about changing environmental conditions. Examining the nature and timing of these strategies can help to identify factors that lead to sustainable and lasting systems, or alternatively to abrupt alterations or reorganization of social and economic systems.

**Faugere, Brigitte (Université Paris 1 Panthéon-Sorbonne)**

[180]

*Colors in the Chupicuaro Ceramic Tradition: A Diachronic Perspective during the Late Formative*

In Northwestern Mesoamerica, polychromy is a characteristic of Chupicuaro pottery during the Late Formative. It is the case for the hollow figures whose decoration is obtained by overlapping geometric motives painted in white and black on a red background. The figurines were also polychrome, even if the paints realized as a last stage of manufacture, post-firing, are generally poorly preserved. But sometimes pigments are retained in hollow spaces. The distribution of colors on these various artifacts seems to respond to a codification that covers meanings that are difficult, but essential to decipher. They seem to emphasize the sensory organs, part of the skull and ornaments, such as earrings or headgear. The archaeometric analyses also make it possible to identify the raw materials used in the preparation of the pigments that would have a hydrothermal origin. The range of pigments used evolves over time, with the notable introduction of specular red pigment, so appreciated by the inhabitants of Cuicuilco and later of Teotihuacan. This introduction of a painting with an iridescent aspect is significant of the influences both in the field of techniques and in the ideology suffered by Chupicuaro at the end of his cultural trajectory.

**Faught, Michael (Archaeological Research Cooperative; SEARCH Inc.)**

[98]

*Discussant*

**Faulseit, Ronald (Los Angeles Pierce College)**

[59]

*Making the Landscape Divine at Dainzú, Oaxaca, Mexico*

Throughout its prehispanic occupation, Dainzú played a significant ceremonial role in the Oaxaca Valley of Mexico. In the Formative period (200 BCE–CE 200), prominent terrain features were intentionally incorporated into the settlement's design with the intent of making a shared place through ritual practice. For example, a ball court and temple complex built at the base of Cerro Dainzú were linked to a shrine on its summit, requiring people to navigate the difficult and unpredictable topography between them as part of a ritual procession. By walking this challenging landscape together, they were not only creating a sacred place but also building community in the process. In later centuries, settlement growth led to expansion into new territory, and leaders found novel ways to construct communities tied to the landscape. In this paper, I will examine diachronic patterns in place-making practices at Dainzú and discuss their social and political implications.

[59]

*Chair*

**Fauvelle, Mikael (Boise State University)**

[96]

*Obsidian Exchange and Political Change: Shifting Patterns of Obsidian Use Across the Late Classic and Postclassic at Fracción Mujular*

Fracción Mujular is a small domestic settlement located on the slopes of Cerro Bernal near the Pacific Coast of Chiapas, Mexico. Founded under the auspices of the Early Classic center of Los Hornos, Fracción Mujular was occupied for nearly 1,000 years, persisting through the Collapse of Los Hornos and entering into a period of rapid expansion during the Late Classic. Located adjacent to a critical trade route along the Pacific Coast that would have linked Central Mexico with the Guatemalan Highlands, the ancient residents of Fracción Mujular had access to goods from across southern Mesoamerica. Which regions traded the most with the site, however, changed considerably through time. This paper presents data from the XRF sourcing of 502 obsidian objects from recent excavations at Fracción Mujular. I use this obsidian source data together with an analysis of the construction history of the site to show how obsidian use patterns at Fracción Mujular shifted in reaction to political changes on both the local and inter-regional level.



**Faux-Campbell, Jennifer (Palo Verde College)****[155]***Human Representations of Structure: A Theoretical Examination of Half-Conical Figurines from Teotihuacan, Mexico*

Despite their ubiquity at Teotihuacan, little is known regarding the role of Half-Conical figurines in the everyday lives of Teotihuacanos. These figurines are thusly referred to as Half-Conicals due to their semi-conical shape. Produced primarily during the Xolalpan (350–550 CE) and Metepec (550–650 CE) periods of Teotihuacan's history, these aesthetic human representations are rarely studied. While many figurine typologies were revealed in Teotihuacan's material culture, these figurines varied from earlier traditions in their aesthetic quality—they are far more ornate and elaborately adorned than previous figurine traditions. Revealed in high, middle, and low status households, these figurines were likely available to all Teotihuacanos. Given their pervasiveness and importance in the Teotihuacan figurine tradition, the researcher seeks to evaluate the sociopolitical implications of Half-Conical figurine use at Teotihuacan through a practice and agent-based approach, arguing that these figurines were one of the many engines by which Teotihuacan elite perpetuated their social power. This social power, enacted by the elite through a top-down approach, led to dramatic changes in the social structure, structure that affected all elements of public and private life, including Half-Conical use in everyday life.

**[155]***Chair***Feak, Angela (University of Michigan), Brian Stewart (University of Michigan), Genevieve Dewar (University of Toronto) and John Kingston (University of Michigan)****[24]***Tracking Paleoaridity through Multi-isotope Analyses of Ostrich Eggshells at Spitzkloof Rockshelter A, South Africa***[WITHDRAWN]****Fedick, Scott (University of California, Riverside) and Louis Santiago (University of California, Riverside)****[23]***Evaluating the Food Values of Alternative Crops and Implications for Drought Effects on the Ancient Maya***[WITHDRAWN]**

Feeley, Francis [179] see Hambrecht, George

Fehren-Schmitz, Lars [158] see Verdugo, Cristina

**Feinman, Gary (Field Museum of Natural History)****[82]***Discussant*

Feinman, Gary [22] see Thompson, Amy

**Fenton, Monica (Louisiana State University)****[72]***What the Shell: The Zooarchaeology of Cerro San Isidro, Peru*

Zooarchaeologists have extensively documented the importance of marine resources in the ancient Andes, and the first field season at Cerro San Isidro (Ancash, Peru) proves no different. The multicomponent hilltop site lies in the agriculturally rich "Moro Pocket" of the middle Nepeña Valley, at least an eight-hour walk from the ocean on the north-central coast. Summer 2019's excavations focused on an elite compound, documenting intermittent occupations from the Late Formative (ca. 600 BCE) through Late Intermediate period (ca. 1470 CE). Most identifiable vertebrate bones are camelid, with cut and burn marks indicating that these animals provided food in addition to transportation. While both aquatic and terrestrial animals are present, four marine bivalve species (rock-perching mussels *Perumytilus purpuratus* and *Semimytilus algosus*, and sand-dwelling clams *Donax obesulus* and *Mesodesma donacium*) dominate an assemblage that is taxonomically rich but not diverse. Relative frequencies of mollusk taxa and corresponding habitats resemble those of Late and Final Formative lower valley sites Huambacho, Caylán, and Samanco, implying that Cerro San Isidro sourced seafood from the same environments and enjoyed trade ties with this neighboring polity. However, better chronological control is needed to understand how site residents' tastes may have changed over time.

**Ferguson, Jeffrey (University of Missouri)****[77]***Discussant*

Ferguson, Jeffrey [30] see Burgess, Blaine

Ferguson, Jeffrey [171] see Iizuka, Fumie

Ferguson, T. J. [109] see Hanson, Kelsey

Ferguson, Victoria [163] see Chapman, Ellen

**Fernandes, Paul (Sarl Paléotime, Université Bordeaux 1), Vincent Delvigne (University of Liège) and Jean-Paul Raynal (Max Planck Institute)**

[77]

*"I've been havin' some hard travelin' . . .": Using the "Evolutionary Chain" Concept in a Dynamical Approach of Silicites*  
Studies about characterization and sourcing of the various siliceous materials (flint, chert, silcrete, and hydrothermal silicite) used by prehistoric foragers became progressively routine. However, simply locating the stratigraphic origin of a rock is insufficient as it may have been collected from varied formations, some being sometimes located very remotely from the primary source. These secondary sources may be characterized using the concept of evolutionary chain in a dynamical, multiscale, and multiproxy process taking in account the mineralogical, chemical, and physical transformations undergone by the raw material, a "memory" that was previously undervalued. A type of raw siliceous is now understood as a population composed of different subtypes that characterize the range of primary and secondary sources from which they originated before they were collected and also integrate their aspects after they were used and discarded by humans. Our analysis method uses three grid-charts (petrography, occurrence, and taphonomy), grouped in a database developed under Microsoft Access and MySQL. This database helps to answer questions about siliceous raw materials definition and description encountered by archaeologists. Thanks to Woody Guthrie, 1964.

Fernandez, Marco [16] see MacDonald, Brandi

Fernandez, Rachael [49] see Nicholson, Christopher

**Fernandez-Gotz, Manuel (University of Edinburgh)**

[92]

*Urban Networks in Early Iron Age Europe: Nucleation and Dispersal*

Urbanization is a social process, rather than a final destination. More important than debating whether one specific settlement within a system should be classified as "urban," "proto-urban," or "nonurban" is to analyze the wider processes of settlement nucleation and centralization that take place within the larger landscape, and which usually form part of a network. In Iron Age temperate Europe, we can distinguish the emergence of a number of urban networks that developed in different times and at varying scales. This paper will focus on the so-called Early Iron Age "princely seats" (Fürstensitze), which developed in Central Europe between the late seventh and the fifth century BC. The research of the last few decades has revolutionized our knowledge of these sites, which included monumental fortifications, evidence for long-distance exchange, and associated elite burials. They represent a prime example of a process of population agglomeration, followed by decentralization or "collapse" after just a few generations. It is argued that both their rapid development and subsequent decline can only be understood as part of a network, rather than at the level of individual sites.

**Fernandini, Francesca (Pontificia Universidad Católica del Perú)**

[128]

*One Settlement, Many Communities . . .*

Research centered in the prehispanic urban settlement of Cerro de Oro, in the Peruvian South Coast, is showing a wide variety of cooking techniques, disposal arrangements, and even culinary preferences that seem to reflect possible different social groupings within the settlement. This paper will present research performed in different residential spaces within Cerro de Oro, focusing on spatial arrangements and use of space, as well as contextual analysis of food-related spaces. This information will be used to explore the particular social configuration that characterized the urban society of Cerro de Oro.

Fernandini, Francesca [10] see De la Puente-León, Gabriela

Fernandini, Francesca [128] see González Gómez de Agüero, Adrián

**Ferras, Mélanie (Lettres Sorbonne Université)**

[84]

*Archaeological Contexts and Social Uses of Pututus in the Prehispanic Central Andes*

Pututus are marine shell trumpets (organologically, horns), known in the prehispanic Central Andes from the Archaic period to the Late Horizon. Different classes of those sound-producing artifacts have been discovered: some of them cut from various species of marine gastropods, and others produced in ceramics that imitate the gastropod shape (skeuomorphs). Pututus can be analyzed as sound-producing instruments via acoustical and organological studies, but they also must be understood as archaeological artifacts, with a strong social focus. By analyzing them within their specific archaeological contexts, we can better comprehend their status, and also trace the evolution of related sound practices through time. Thus, it is possible to determinate different social uses of pututus, which are, most of the time, related to their acoustical possibilities. In this study, I take a complementary approach to analyzing archaeological contexts, sound-related evidence, and iconographic data to produce a comprehensive evaluation of social sound practices involving pututus in the prehispanic Central Andes.

Ferrer, Alexa [40] see Hansen, Nicolas

Fertelmes, Craig [143] see Plumlee, R. Scott

Fie, Shannon [30] see Burgess, Blaine

Field, Erin [85] see Bush, Dominic

**Field, Sean (University of Notre Dame), Donna Glowacki (University of Notre Dame) and Timothy Hovezak (Mesa Verde National Park)**  
[26]

*The Far View Archaeological Project: An Introduction*

Over the history of Mesa Verde National Park (MVNP), the Far View community has been the focus of multiple, yet discrete, archaeological projects, from Fewkes' excavations in the 1920s to more recent architectural documentation and stabilization in 2012. However, there are gaps in survey coverage, site forms require updating, and the community lacks an overall synthesis and interpretation of its social history. We report on our first season of a five-year collaboration with MVNP entitled the Far View Archaeological Project (FVAP). The primary goal is to re-assess settlement on Chapin Mesa through a full coverage survey of the Far View community, a densely populated pueblo village centered on Far View Great House. We use modern high-resolution techniques, including GPS mapping and drone-based photogrammetry, to record Pueblo habitations. We present the results from our first season when we recorded 18 sites, including 15 habitation sites and covered 38 acres. While many of these sites had been previously recorded, or were excavated by J.W. Fewkes in 1922 (Far View Tower), and by R. Lister and the UC-Boulder Field School (1954–56; 5MV866, 5MV875), we also identified three previously unrecorded sites.

**Fields, Mara (Baylor University), Todd Ahlman (Texas State University), Grace Tolan (Rhodes College), Jon Russ (Rhodes College) and Stephen Carmody (Troy University)**  
[32]

*Residue Analysis of Clay Tobacco Pipes from an Eighteenth-Century St. Eustatius Plantation*

This study examines clay smoking pipes recovered from an eighteenth-century plantation sugar works (SE095) on the Dutch Caribbean island of St. Eustatius. The pipes are used to date the assemblage and gain a better understanding of acquisition, smoking, and discard practices of enslaved Africans who labored on the plantation. Results from residue analysis on pipe bowls gives insight into what people at the sugar works were smoking, confirming whether it was tobacco, a combination plants, or other substances being smoked in the pipes. The results of the preliminary study pooled with residue analysis provide a clearer picture of the site history for the sugar works as well as the day-to-day personal activities of the enslaved Africans who lived and labored on the plantation.

**Figueroa, Alejandro (Southern Methodist University)**

[129]

*The Archaeofaunal Dimension of Preceramic Human-Environment Dynamics in the Highlands of Southwestern Honduras*

The study of the Preceramic period (ca. 11,000–5,000 cal BP) in Mesoamerica has focused on the transition from a foraging way of life toward agriculture, plant domestication, and sedentism. Yet we know little about the processes and contexts that drove this transition, particularly the relationship between foragers and animal prey. In this paper I present the results of my dissertation research, which evaluated Preceramic subsistence and mobility by analyzing the animal remains recovered from the El Gigante rockshelter, a multicomponent site in southwestern Honduras that was occupied episodically for 11,000 years. My research shows El Gigante's earliest inhabitants returned to this landscape periodically as part of a broader seasonal round despite declines in the availability of high-ranked prey (i.e., deer). These behavioral changes suggest the highlands of southwestern Honduras were more climatically and environmentally stable than the neighboring lowlands, making them more suitable for repeated occupation. Equally as important, my research, when coupled with existing and ongoing investigations of the site's macrobotanical assemblage, found that the persistent use and purposeful modification of this landscape resulted in an increase in the abundance of desired species, including a number of fruit trees and deer, which had positive long-term effects.

Figueroa Beltran, Carlos [184] see Mathwich, Nicole

**Filloy, Laura (Museo Nacional de Antropología) and María Olvido Moreno**

[180]

*Shimmering Gold and Feathers: Strategies for Making Feathered Objects with Metal Applications*

The Mexica employed feathers to make lightweight objects utilized by elites and gods in various secular, religious, political, and military contexts. The use of feathers is represented in murals, codices, ceramics, sculpture, metalwork, and even some of these objects that have managed to survive more than five centuries. Luxury and wealth were expressed through materials that exhibited brilliance and chromatic profusion. Multicolored feathers were combined with other materials that reflected light such as polished stone, pearl, shell, or metal to create objects infused with religious significance. These materials vibrate, shine, change color, and produce a dynamic and dazzling effect as the bearer moves or the object oscillates, in addition to being extremely pleasing to observe and touch. Specialized artisans turned woody grasses, agave, and cotton into thread, cord, paper, textile, netting, and matting to make a structural system for these objects that was hidden from view. For ornamentation, feathers were glued or tied, and metal plates were attached or sewn to allow a certain range of mobility. This presentation will examine various strategies used in the art of Mexica featherworking to bring out the splendor of various materials in complex objects.

Filzmoser, Peter [77] see Brandl, Michael

Finley, Judson [130] see Robinson, Erick

**Fisher, Abigail (Southern Methodist University) and Lewanne French (Bluebonnet Animal Clinic)**

**[129]**

*Canine Dental Damage and Dental Pathology as Indicators of Changing Haulage Roles during the Transition to Agriculture*  
Dogs were an important resource for many Plains peoples, especially for the transportation of materials (e.g., timber, meat, water). The use of dogs for traction may have even facilitated high mobility in early North and South American populations. This high mobility eventually decreased with the introduction of agriculture across the northern Plains. Did the adoption of agriculture also change the roles of dogs and their significance as a hauling tool? This research assesses canine dental/mandibular damage and dental pathology on the northern Plains to investigate changing care, dietary, and husbandry practices associated with the adoption of agriculture. Dentition and cranial fragments are often the only surviving elements from canids in the archaeological record, and thus a significant source of data for the treatment of these animals. If dogs decreased in significance, there may be observable changes in nutrition and treatment, reflected in dental development, observable trauma, and pathology.

**[129]**

*Chair*

**Fisher, Erich (Arizona State University), Stephan Winkler (iThemba LABS, NRF, Johannesburg), Shara Bailer (New York University), Hayley Cawthra (Geophysics and Remote Sensing Unit) and Irene Esteban (Evolutionary Studies Institute)**

**[151]**

*Update on Research at the Site of Waterfall Bluff, Eastern Cape Province, South Africa*

**[WITHDRAWN]**

Fisher, Kevin [191] see Kulick, Rachel

**Fisher, Lynn (University of Illinois, Springfield), Susan Harris, Corina Knipper (Curt-Engelhorn-Centre of Archaeometry, Mannheim) and Rainer Schreg (University of Bamberg, Germany)**

**[21]**

*What's in a Hammerstone? Insights on Core Technology at a Neolithic Quarry in Southern Germany*  
Stone shaping tools and hammerstones are among the most ancient and ubiquitous of stone implements in the archaeological record, but they are not commonly studied in detail in archaeological context. This poster presents results of a comparative study of chert objects that show percussion scars at a Neolithic chert quarry in southern Germany. Variation in the type, pervasiveness, and location of percussion scars suggests that chert hammerstones were used in several distinct ways in early stage lithic production. Distinctive marks of crushing, hammering, and splitting are interpreted, in the light of literature on experimental archaeology and our own limited experiments, as representing a combination of techniques for splitting large nodules and producing large flakes. We discuss this analysis of chert percussion objects at the quarry in context of a regional project combining surface survey, collections analysis, and test excavations to investigate upland Neolithic settlement and quarry features on the southeastern Swabian Alb, a significant regional source of chert. Comparisons to materials found in surface survey, including cores on large flakes, offer insights about patterns of local chert consumption. Results of this project contribute to an understanding of diversity in technological processes at quarries and settlements in the Central European Neolithic.

Fisher, Suzanne [153] see Harle, Michaelyn

**Fitzgerald-Bernal, Carlos (Universidad Santa Maria La Antigua), Alvaro Brizuela-Casimir (Anthropo Studio Inc.) and Freddy Rodríguez-Saza (Externado de Colombia)**

**[178]**

*Reassessment of Population Density in Late Precolumbian Central Caribbean Panama*

Using radiometric and settlement survey data from an area with 100% survey coverage in the rain-forested lowlands of the Caribbean watershed of Colón, Panama, we present the results of an analysis of site distribution and <sup>14</sup>C dates to calculate population density. The archaeological data is compared with previous population assessments in the literature and controlled ethnographic and ethnohistoric information in order to better understand the population history of that section of the isthmus (mostly unpopulated since the sixteenth century) and comment on the possibilities of reconstructing the population dynamics of chiefdoms in pre- and postcontact Central and Eastern Panama ("Gran Coclé" and "Gran Darién" regions).

**Fitzhugh, William (Smithsonian Institution), Michael Mlyniec (Smithsonian Institution) and Igor Chechushkov (Smithsonian Institution)**

**[148]**

*More Than Just a Pot: The Social Life of Soapstone Vessels among the Southern Labrador Inuit*

**[WITHDRAWN]**

Fitzmaurice, Rosamund [23] see Saldaña, Gabriela

**Fitzpatrick, Leslie (Mercyhurst University)**

[9]

*Stable Isotopic Examination ( $\delta^{18}\text{O}$ ,  $\delta^{15}\text{N}$ ,  $\delta^{13}\text{C}$ ) of Human Remains from the Santa María de Zamartze, Uharte-Arakil Municipality, Navarre Region, Spain*

An initial subset ( $n = 5$ ) of the human remains ( $N = 155$ ) recovered during the 2011–2015 excavation seasons from the Santa María de Zamartze church burial grounds were analyzed for stable oxygen, nitrogen, and carbon isotopic values derived from bone and tooth carbonate and collagen. As this site is positioned in close geographic association with a Medieval religious pilgrimage route and several of the individuals were recovered with probable religious-based burial goods, the stable isotope analyses conducted for this investigation elucidate the probable geographic region of origin for the individuals sampled. Mobility profiles across the life histories of these individuals as well as dietary profiles are examined as well. This preliminary research contributes to the emerging stable isotope dataset for this region of Spain and constitutes some of the primary data related to the medieval period in Navarre.

**Fitzpatrick, Scott (University of Oregon)**

[83]

*Discussant*

Fitzpatrick, Scott [130] see Hanna, Jonathan

Fitzpatrick, Scott [83] see Ono, Rintaro

Fitzpatrick, Scott [83] see Napolitano, Matthew

Fitzpatrick, Scott [83] see Stone, Jessica

Fitzpatrick, Scott [83] see Weyrich, Laura

**Fitzpatrick, Tony (University of Wyoming)**

[3]

*Collagen and Apatite Stable Isotope Values from Bison Bone at the Hell Gap Site*

This work adds collagen  $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$  to the apatite  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  values previously presented by the author, as well as C:N ratios demonstrating the viability of many samples from Hell Gap. Bison bone can be found throughout Paleoindian deposits at the site, providing a possible proxy for regional climate change. Carbon ratios for collagen samples ( $n = 23$ ) range from  $-19.08\%$  to  $-14.60\%$ , and apatite, which is currently a smaller subset of samples ( $n = 13$ ), from  $-9.4\%$  to  $-6.5\%$ . Apatite-collagen spacing of carbon is between  $8\%$  and  $10.41\%$ , with an average of  $9.23\%$ . Apatite  $\delta^{18}\text{O}$  values range from  $-10.2\%$  to  $-8.0\%$  and collagen  $\delta^{15}\text{N}$  from  $5.15\%$  to  $10.62\%$ . These data are compared with existing paleoclimate information from Hell Gap and the surrounding area.

**Fitzsimons, Rodney (Trent University) and Matthew Buell (Trent University)**

[191]

*Minoans at Aghios Nikolaos? Preliminary Results of the Khavania Topographical and Architectural Mapping Project*

This paper presents the preliminary results of the Khavania Topographical and Architectural Mapping Project (2019), whose primary objective was to document all natural and anthropogenic features at the coastal site of Khavania, East Crete. Exploration of the eastern and southern shores of the Mirabello Bay has produced abundant evidence for cultural development in the region, which stands in stark contrast to the lack of attention shown for the western side of the bay. Rescue excavations have produced a solid understanding of the historical landscape, but the earlier prehistoric remains continue to elude detection. It is in this context that Khavania begins to assume such importance. Utilizing both traditional and digital means of architectural recording, we identified a number of structural features, while limited collection of surface materials indicates activity spanning the Early Bronze Age through to the Medieval era. Finally, analysis of fixed and portable remains indicates that Khavania's residents were interacting with contemporary settlements within the broader region throughout these periods. These results allow us to begin filling in a striking lacuna in the larger archaeological landscape that occupies a key, strategic position at the crossroads of several important communication routes running along the north shore of the island.

**Flanagan, Kelin (Archaeological Consulting Services, Ltd.), Astrid Runggaldier (University of Texas, Austin) and Samantha Krause (University of Texas at Austin)**

[80]

*Maya Structures for Wet and Dry Seasons: Adaptive Strategies and Microenvironments at the Site of Chulub in the Crooked Tree Lagoon System*

This study evaluates a water feature and two associated structures within the Late Terminal/Early Postclassic Maya site of Chulub in the Western Lagoon Wetlands near the island of Crooked Tree, Belize. The term "pocket *bajo*" is a term used to describe water features that are similar to *bajos* in morphology, but smaller. Previous research in northern Belize, at the site of Aventura (Grauer 2019), posits these depressions were integral for a variety subsistence practices, blurring the lines between agriculture and opportunistic resource gathering. We present a spatial, material, and edaphological analysis of two structures located adjacent to a single water feature at Chulub to determine if "pocket *bajo*" is an appropriate descriptor. The structures were excavated between 2018 and 2019 at different times of the year (wet vs. dry season), artifacts were recovered, and soil samples were taken. This paper outlines the preliminary assessment of water feature relationships with the local architecture in hopes of answering larger questions of adaptive strategies in response to drought and prehistoric aquaculture at this site.

**Fleming, Edward (Science Museum of Minnesota)****[105]***Woodland and Late Precontact Interaction along the Saint Croix River Corridor in Minnesota and Wisconsin*

The Saint Croix River is a major tributary to the Upper Mississippi River and forms a boundary between eastern Minnesota and northwestern Wisconsin. Flowing southward out of northwestern Wisconsin and entering the Mississippi near the Twin Cities, this 170-mile, north-south valley offered a passageway connecting communities of the North Woods and Western Great Lakes to the prairies of southern Minnesota and the Driftless Area of western Wisconsin. Drawing on data from recent surveys and excavation in the Saint Croix Valley by the Science Museum of Minnesota and University of Minnesota, this paper will examine evidence for interaction and mobility along the Saint Croix River and across environmental boundaries during Woodland and Late Precontact times.

**Fletcher, Roland (University of Sydney)****[92]***Urban Network Resilience and Fragility*

Residential densities within the settlements of sedentary communities vary between about 1,000 p/ha and less than 10 p/ha. Some regional settlement networks consist predominantly of settlements with compact, high-density residence patterns while others are dominated by settlements with dispersed, low-density residence patterns. Compact settlement networks display substantial resilience. While individual settlements may fail the networks continue. By contrast, networks of settlements with dispersed occupation patterns tend to fragment after the demise of the major settlements. New networks form away from the former metropolitan heartland regions as can be seen following the ninth-century CE demise of the Classic Maya network and the fourteenth- to fifteenth-century CE demise of Angkorian empire network. The resilience of compact urban settlement networks has appeared to be normal and unproblematic. But now as the very different futures of networks of dispersed settlements are known the differing network outcomes require explanation. Once compact urbanism is present in a region its networks generally appear to be permanent. But what of the Harappan network? Conversely, the overlap of the Preclassic to the Classic Maya dispersed urban network may be of great significance for dispersed settlement networks. There are some implications for the future of present-day urban networks.

**Flewellen, Ayana (University of California, Riverside; Society of Black Archaeologists)****[75]***Discussant***Flores, Jorge (Binghamton University (SUNY))****[149]***Salt Exploitation in the Northern Ecuadorian Highlands: A Substance of Transformations*

Salt extraction was always important to local communities due to its uses in food preparation, food preservation, therapeutic practices, and ritual performances. The importance of this mineral for food conservation, nutrition, and other human physiological needs is widely known. However, few local studies have specified the role of this mineral in Andean people's health, particularly in its effects against endemic goiter. In 1986, Pomeroy explored the effects of salt consumption in Ecuadorian highland societies identifying goiter disease as a major public health issue from colonial times until the early twentieth century. However, information about salt contents from Santa Catalina de Salinas, and other saline sources in Ecuador, is limited. Preliminary data obtained from the chemical and mineralogical analysis of saline soils and salts extracted from the three major saline sources in Ecuador show important information that will reinforce the understanding of the benefits or issues that salt consumption could generate in ancient times. The objective is to identify the role of salt in human health; particularly, to determine how the physical and chemical properties of salt impacted the health of residents of the northern Ecuadorian Andes allowing to establish the vitality that circulates between people and things they consumed.

Flores-Aqueveque, Valentina [98] see Cartajena, Isabel

Flores-Aqueveque, Valentina [47] see López Mendoza, Patricio

Flynn, Brianna [37] see Sedig, Jakob

Foe, Aldo [150] see Hills, Kendall

Foias, Antonia [136] see Emery, Kitty

**Folch, Ramon****[189]***Identifying Lakam-Tun: A Sixteenth-Century Maya Fortified Site in Lake Miramar, Chiapas, Mexico*

Research on the Postclassic period at Lake Miramar in the southern Lacandon Jungle of Chiapas permits identifying the fortified island of Lakam-Tun. The site was destroyed in 1586 by Juan de Morales Villavicencio in his attempt to conquer the Cholti'-Lacandon, who then sheltered deeper in the jungle until 1695. Earlier research failed to locate important Postclassic evidence and local conflict halted further research. New investigations in Frans Blom's, Frederick Peterson's, and INAH's archives gave new

insight in the matter and pointed to the Island of Carrizal as candidate to be Lakam-Tun. It is not accessible today, due to social problems, but information in Blom's and Peterson notes, on site research and historic documents permit locating the late Lacandon village. This site is key to understand conquest period relations between the Highlands and the Lowlands. Ethnohistoric data shows constant interaction between the Cholti'-Lacandon and Highland Maya in Chiapas and Guatemala, and a well-known rivalry with the Itza-Maya in Tayasal. Research in Lakam-Tun is key to identifying the latter site of Sac-Bahlam which has escaped archaeologists for decades. This important contact period settlement that was destroyed and never reoccupied is crucial to define the material culture of the Cholti'-Lacandon.

**Follensbee, Billie (Missouri State University)**

**[139]**

*Diamonds in the Rough: Olmec and Olmec-Related Occurrences of the Rhombus Motif and Its Variations*

As ancient cultures throughout the world developed textiles, knotted and woven fabrics lent themselves to the development of geometric rhombus patterns, first as the diamond-shaped mesh of knotted nets and later as square patterns in twined gauze and plain-weave cloth. Further early experimentation in basketry and cloth twill weaves led to the development of diagonal lines, zigzags, chevrons, triangles, diamonds, and diamond-and-dot motifs. Scholarly research has identified and discussed these textile motifs throughout the ancient Americas, further revealing how these patterns were recognized and meaningful, with links to gender, affiliation, and status. Little research, however, has been conducted on rhombus textile motifs in Formative period Mesoamerican cultures such as the Olmec. This is in great part because direct evidence of Olmec textiles is scanty, consisting of only a few fragments of cordage and woven mats, two fabric-impressed clay sherds, and artifacts recently identified as tools for manufacturing textiles. Close analysis of this existing evidence, along with the identification of these textile motifs in Olmec ceramics, sculpture, and architecture, reveals that rhombus and related patterns are strongly in evidence in the Formative period, and that as with later Mesoamerican cultures, these motifs likewise held deep, symbolic meaning for the Olmec.

**[139]**

*Chair*

Follensbee, Billie [107] see McElfresh Buford, Katie

**Fonseca, Sofia (German Archaeological Institut, ICArEHB - Algarve University), Jörg Linstädter (DAI [German Archaeological Institute]), Décio Muianga (University Eduardo Mondlane) and João Cascalheira (ICArEHB, Algarve University)**

**[124]**

*Online Education on African Archaeology and Heritage: The ONLAAH Platform*

The Onlaah platform is formed by a consortium of institutions and partners, from Africa and around the world, such as the German Archaeological Institute (DAI), the University of Namibia (UNAM), the University Eduardo Mondlane (Angola), the ICArEHB (Algarve University, Portugal), the Autònoma University of Barcelona (Spain), the Neuchâtel University (Switzerland), and the University of Louisville (USA). Our main objective, the creation of an online course (MOOC) on African Archaeology and Heritage, brings together the experts (teachers and researchers) and the resources (online archives, publications, databases) and offers them in an organized way to students worldwide, with a special focus on African students. The courses can be followed on the Coursera platform through computers, tablets, or smartphones. We will present our platform to the SAA community and discuss its possibilities, necessities, and experiences regarding online education.

**Ford, Anabel (UCSB)**

**[57]**

*Discussant*

**Ford, Anabel (UCSB)**

**[131]**

*Intensification without Modification: Tropical Swidden and the Maya*

As we look at agricultural intensification and the archaeological correlates, we need to understand that capital based investment and arable farming are only one path to intensification. 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. Embedded fields transform to forests in a poly-cultivation practice that emphasize diversity that prevails in the tropics. The Maya milpa cycle reduces temperature and evapotranspiration, conserves water, promotes biodiversity, builds fertility, inhibits erosion, and nurtures people. These labor investments do not leave direct evidence on the landscape, save the implicit density of settlement, yet the imprint of their management is in the forest itself.

Ford, Anabel [23] see Horn, Sherman

Ford, Anabel [71] see Tran, Justin

**Ford, Ben (Indiana University of Pennsylvania) and William Chadwick (Indiana University of Pennsylvania)**

**[19]**

*Preliminary Results from Newport Site (36IN188)*

Newport village was founded in ca. 1787 to facilitate movement of people and goods from Pennsylvania's early road system to riverine highways. The town was largely abandoned by 1840, but contained several taverns, blacksmith shops, and infrastructure for loading boats on, and crossing over, the adjacent Conemaugh River. At its height approximately 30 families lived in the village and

were served by a store and US Post Office. As an early settlement in western Pennsylvania, linked directly to the development of transportation and trade in the region, this site contains important information about the frontier period of the Midwest. Recent excavations at the site have begun to determine the site boundaries, identify the street layout, and investigate the village store to better understand local trade. These excavations also revealed evidence that the landscape was settled by Native Americans centuries, and possibly millennia, earlier.

Ford, Jamie [180] see Marroquín, Jaime

**Forest, Marion (Brigham Young University) and Andrew Somerville (Iowa State University)**

[177]

*Return to Hacienda Metepec: Exploring Continuity and Change at Teotihuacan*

Recent archaeological research in central Mexico has examined the transformations of prehispanic communities during the Epiclassic period (AD 550–850) from the perspective of Teotihuacan's neighboring settlements and peripheral regions. Less attention, however, has been given to the concomitant structural changes that occurred within the urban settlement itself. Excavations conducted in 1979 by Evelyn Childs Rattray at Hacienda Metepec (9:N1E7), near the eastern edge of Teotihuacan urban core, yielded important archaeological data relevant to understanding the Classic–Epiclassic transition and to better characterizing the economic, ritual, spatial, and demographic transformations at the site. Surface collection data from the Teotihuacan mapping project and Rattray's excavations demonstrate a continuous stratigraphy at Hacienda Metepec from the Classic to the Postclassic periods and the presence of a sizable Coyotlatelco (Epiclassic) phase occupation. In this paper, we synthesize previous research conducted at Hacienda Metepec and discuss the importance of this data within the context of our current knowledge of the Classic to Epiclassic transition and in light of current hypotheses regarding these changes. Finally, we present an outline of future field research at Hacienda Metepec.

**Forget Brisson, Laurence (Université du Québec à Montréal), Michel Lamothe (Université du Québec à Montréal), François Hardy (Université du Québec à Montréal) and Kelly Graf (Texas A&M University)**

[34]

*Contributions of IRSL to the Issue of Initial Settlement in the New World: The Case of the McDonald Creek Archaeological Site*

The McDonald Creek archaeological site from central Alaska (USA) has been dated using optically stimulated luminescence (OSL) in order to document the initial settlement in the New World. Eolian sediment samples (loess) from stratigraphic profiles have been systematically dated using this method and have been compared to the radiocarbon ages of the different human occupations present at the site. The interpreted geochronology suggests an initial human occupation of the area at the end of the Upper Pleistocene, which is in good agreement with the regional archaeological framework. A measurement protocol for the luminescence dating method with infrared stimulation (IRSL) has been developed to obtain accurate and reliable results for the minerals extracted from these late glacial loess sediments. The LPH-IRSL (low temperature preheat IRSL) protocol thus allows in this case the establishment of a detailed geochronological framework for the Central Alaska region. A relationship can be made between the eolian sedimentation rates and the territorial habitability patterns of the early human groups present in central Alaska. This relationship is implicitly relating paleoenvironments to regional climate changes, since loess accumulation rates can be directly correlated with the glacial history of the region, especially with the fluctuating position of the ice margin.

Forman, Steven [143] see Plumlee, R. Scott

**Forste, Kathleen (Boston University) and Deirdre Fulton (Baylor University)**

[94]

*A Specialized City: Fatimid-Era Agriculture at Ashkelon*

The ancient city of Ashkelon was a major economic port in the Near East during the Early Islamic period (ca. 636–1200 CE). Located on the Mediterranean coast of modern-day Israel, it was a cosmopolitan city, an administrative center, and a stronghold in the coastal fortification system. Merchants and artisans at Ashkelon traded goods via maritime and overland trade routes from Egypt, Syria, Iraq, and the Far East. The wealth of the city is illustrated by the expansion of neighborhoods and the luxury goods that included gold filigree jewelry, imported Chinese porcelains, and delicate carved items in bone and ivory. While the layout and function of Early Islamic Ashkelon are understood, the details of its agricultural economy are less-so. In this paper we use archaeological faunal and botanical data from Ashkelon to argue that the agricultural economy during the Fatimid period (969–1153 CE) was one of investment agriculture, contra subsistence agriculture, which supported the specialization of small industry and contributed to the city's economic stability. Our data come from households, workshops, and refuse dumps, representing various depositional pathways that enable us to re-create how people at Fatimid-era Ashkelon utilized plant and animal resources in their daily lives.

[94]

*Chair*

**Forton, Maxwell (Binghamton University)**

[85]

*The Crash at Basset Peak: Documenting a World War II-Era Bomber Crash for a Fuels Management Project on Coronado National Forest*

In January of 1943, a B-24D heavy bomber on a training run crashed near Basset Peak in the south end of the Galiuro Mountains, killing all 11 men on board. The Galiuro Mountains are located in southeastern Arizona, with much of the range being preserved



within the Galiuros Wilderness Area of Coronado National Forest. Due to the remote location, much of its cultural history remains undocumented by professional archaeologists, including the crash site of the 1943 B-24D bomber. For the past five field seasons, Coronado National Forest began incrementally conducting controlled burns on sections of the Galiuro range, as part of a larger fuels management strategy. The B2–24D bomber crash is a historic site at risk of impact from the next stage of these controlled burns, presenting an unconventional cultural resource for documentation by the Coronado National Forest Heritage Program. Documenting this site will shed light on an important, if tragic, event in the history of southern Arizona and is a unique opportunity to develop alternative survey and preservation strategies for atypical cultural resources located within fuels management project areas.

**Fowler, William (Vanderbilt University)**

[138]

*Moderator*

[138]

*Discussant*

**Fowles, Severin (Barnard College, Columbia University) and Alison Damick (University of Texas, Austin)**

[145]

*The New Indigeneity of Thirteenth-Century New Mexico*

The thirteenth century was a period of heightened social transformation in the northern Rio Grande region of New Mexico. Local populations swelled with the arrival of Pueblo immigrants, older dispersed settlement systems were replaced by densely occupied villages, and commitments to agricultural production deepened. Concurrent with these changes was a revolutionary transformation in the way communities related to their surrounding landscapes and expressed what, in a modern idiom, would be referred to as their indigeneity. In this paper we seek to clarify this new discourse of indigeneity and its material ramifications through a study of the ancestral Picuris village of Tunuypa, one of the largest thirteenth-century pueblos in the region. Tunuypa has not previously been reported, and this paper therefore also seeks to establish the significance of its position within the wider coalition period history of the Rio Grande valley.

[145]

*Chair*

Fracchia, Adam [38] see London, Marilyn

**Frachetti, Michael (Washington University in St. Louis)**

[55]

*Discussant*

**Frachetti, Michael (Washington University in St. Louis) and Farhad Maksudov (Institute of Archaeology, Uzbekistan)**

[92]

*Nomadic Cities and Network Modularity: Scalar Analysis in Ancient Urbanism and Social Connectivity*

The discovery of small to mid-sized cities (Tashbulak and Tugunbulak) built by the Qarakhanids (ninth–twelfth century CE) at high elevation illustrates that urban centers used by nomadic khanates may have operated under a unique model of “modular” urbanism, which we define as a hybridized form of urban development and nomadic kinship structure, wherein cities and towns functioned as economic, political, and religious nodes within highly “modular” systems. Unlike better known “nodal models” for oasis cities, these high-altitude centers acted as the crossing points for a much larger, dispersed nomadic population (who were not necessarily living in the town/city itself). Modularity here is used to mean that regional power was generated through scalable clusters of connectivity between diverse urban transfer-hubs, where power, wealth, etc., helped define wider communities of participation and enabled network growth without significant population pressure in the towns themselves. As such, the growth or decline of particular centers (within a module) might not change quantitatively the overall functionality of the cluster, unless broader systemic connectivity expanded or collapsed. This paper explores this conceptual turn in understanding Silk Road cities and towns, and illustrates preliminary results on modeling how modular urbanism might have functioned in Medieval Central Asia.

**Francis, Julie (University of Wyoming) and Mark Willis**

[53]

*The Black Rock Site: It's Not Just Paleoindian Rock Art*

Black Rock is an extremely rare, fully pecked rock art site in southwestern Wyoming. It is dominated by unusual anthropomorphic forms and associated abstract/geometric designs, with three identifiable zoomorphic figures (two mountain sheep and one elk). As part of a 1990s dating study, <sup>14</sup>C and rock varnish microlamination age estimates suggested a Paleoindian age (Liu and Dorn 1996) for the completely revarnished petroglyphs, and some investigators inferred the imagery to represent one contemporaneous scene. Additional recording completed in 2018 documented multiple manufacturing episodes and superimpositions, with at least two distinct types of anthropomorphic figures. In addition, finely scratched figures, reflecting usage of the site during the Late Prehistoric or Protohistoric period, were also identified. A Paleoindian age for the earliest rock art manufacture is considered likely, with subsequent additions to the panel during the Holocene. A Great Basin affiliation for the pecked rock art is also likely.

**Franco, Nora (CONICET-IMHICIHU; University of Buenos Aires-FFyL)**

[68]

*Bifacial Technology in Central-South Patagonia: A Preliminary Insight into Hunter-Gatherer Behavior during the Pleistocene-*

*Holocene Transition and Early Holocene in the Deseado Massif and Nearby Spaces*

Bifaces can be useful in different kinds of situations. For example, they can be part of a curated strategy for peopling of new environments, as well as during their colonization. The knowledge of their distribution around the landscape, taking into account raw materials involved as well as their manufacturing stages and discard causes, compared with lithics availability, can be useful for the understanding of hunter-gatherers' technological organization as well as their distribution of activities around the landscape. We will analyze here the case of the initial occupations of the Deseado Massif and nearby spaces, areas with different resource distribution. According to available evidence, early human occupations of these spaces took place during a period more humid than today. The analysis is based on the integration of stratigraphic and surface material, and takes into account technomorphological as well as raw material variations in bifaces through time.

**Francois, Alexis (Epsilon Systems Inc.)****[54]***Health and Healthcare Management in a California Black Town*

After the dissolution of the Reconstruction Era, black Americans were faced with the legislative and social constraints of the Jim Crow Era. These limitations on life spurred a call to action to create black settlements free of white supremacy and anti-black sentiments, such as the settlement of Allensworth. The town of Allensworth, located in Tulare County of California's Central Valley, was founded by Col. Allen Allensworth in 1908, becoming California's first self-governed and economically independent African American town. This research focuses on addressing how this community negotiated healthcare choices and health related life experiences while living on the social and physical periphery. The abundance of pain-relieving medicines analyzed in the Allensworth assemblage sheds perspective on the daily management of pain the residents experienced while fulfilling their dreams of a blackutopia. By examining the communities medicine bottle assemblage, we can illuminate how a marginalized group navigated the daily, individual, and collective, need for healthcare and have a better understanding of the human experience in revolutionary towns, such as Allensworth. In the specific case of Allensworth and towns like it, this research adds to the growing discourse on Postbellum black American settlements and their experiences.

**[54]***Chair*

Frank, Jacob [131] see Langlie, BrieAnna

**Frashuer, Anya (Arizona State University), Christopher Carr (Arizona State University) and Michael Glascock (Archaeometry Laboratory at the Missouri Research Reactor)****[171]***Ceramic Exchange and Community Organization of Middle Woodland Period Hopewell Groups in the Scioto Valley, Ohio*

This paper examines ceramic exchange as a proxy for the social interaction aspect of community organization in Middle Woodland period Hopewell groups living in the Scioto River region of Ohio. The results of instrumental neutron activation analysis (INAA) and electron microprobe analysis (EMA) are discussed as they relate to the interaction and influence expectations of two models proposed: the more constricted dispersed sedentary community model and the fluid regional-use model. The characterization of clay and temper resources that were available to the peoples and potters living in the region was conducted as a first step prior to identification of nonlocal wares. Ceramic samples from 23 sites across the region dating to the Early to Fort Ancient periods were subjected to INAA and EMA and the resulting data were analyzed using principal components analysis (PCA) and hierarchical cluster analysis. Once a preliminary characterization was addressed, the ceramics from Middle Woodland contexts were re-assessed using PCA and cluster analysis to identify nonlocal wares. These potential nonlocal wares were then compared to the clays and tempers characterized for different areas within the Scioto Region to determine potential provenience. The frequency and scale of exchanged wares were then assessed based on model expectations.

Frederick, Charles [30] see Cesaretti, Rudolf

**Frederick, Katelyn (Texas State University)****[67]***Hips Don't Lie: A Validation Study of the Albanese Metric Sex Estimation Method for the Proximal Femur on a Modern North American Population*

Sex estimation is a key component of the biological profile used in skeletal studies for bioarchaeology and forensic anthropology. In the crucial need for non-pelvic sex estimation methods, Albanese (2008) introduced a new method that implements measurements between three newly defined landmarks on the proximal femur. These landmarks create a triangle which reflects both the angle of the femoral neck and the concomitant adaptations from the female pelvis. The original study generated logistic regression equations for sex estimation that are not population specific and have achieved a 95–97% allocation accuracy. In this validation study, Albanese's method was applied to samples from the Texas State University Donated Skeletal Collection ( $n = 100$ ) and the William M. Bass Donated Skeletal Collection ( $n = 50$ ) and achieved an allocation accuracy of 89% and 92%, respectively. I conducted an intra-observer error assessment ( $n = 20$ ) and obtained an error margin of less than 1%. Considering these results, the Albanese (2008) method of sex estimation is an exceptionally reliable method thus far and would benefit strongly from other studies to further validate or negate it as a universally applicable approach.

**Freeman, Andrea (University of Calgary)****[172]***Moderator***[172]***Discussant***Freidel, David (Washington University in St. Louis)****[188]***Moderator*

Freidel, David [76] see Navarro-Farr, Olivia

Freidel, David [51] see Rich, Michelle

**Freiwald, Carolyn (University of Mississippi), Sarah Clayton (University of Wisconsin, Madison) and Kaedan O'Brien (University of Utah)****[177]***Isotopic Diet and Migration at Chicoloapan Viejo, Mexico*

Chicoloapan grew and prospered after the decline of Teotihuacan, but little is known about the Epiclassic population that lived there and elsewhere in the Basin of Mexico. An isotopic and osteological analysis of six individuals recovered from salvage and archaeological contexts provides a glimpse into the lives of Chicoloapan residents. Strontium and oxygen isotope values in tooth enamel reveal no immigration but provide the local values for the site and expand human baseline values for Basin of Mexico populations. Analysis of carbon and nitrogen isotope values in bone collagen and apatite show a diet heavy in C<sub>4</sub> resources. Significant tooth wear suggests some nondietary use of plants. Sulphur isotope values also provide dietary and locational information for individuals using catchments with volcanic lithologies in Mesoamerica. These data reconstruct the lives of Chicoloapan residents from birth to burial and provide a point of departure for future analysis of lifeways in the Basin of Mexico after Teotihuacan.

French, Lewanne [129] see Fisher, Abigail

**Freund, Kyle (Far Western Anthropological Research Group), Silvia Amicone (Competence Center Archaeometry - Baden-Wuerttemberg), Beatrice Boese (University of Tübingen, Germany), J. M. Adovasio (Senator John Heinz History Center, Pittsburgh) and Allen Quinn (Allegheny GeoQuest, Pittsburgh)****[17]***Petrographic Analyses of Prehistoric Ceramics from the Sexton Site (8IR01822), Indian River County, Florida*

The Sexton Site (8IR01822) is situated on a slightly elevated limestone hammock in Indian River County, Florida. Extensive geophysical prospection, shovel probing, and subsequent block excavations in 2019 revealed the presence of a midden with a possibly contiguous seasonal village or hamlet of probable Woodland age. Nine hundred ninety-two ceramic sherds were recovered, including St. Johns Plain, Dunn's Creek Red, and sand-tempered plain wares. Twenty-four samples were selected for petrographic analysis, highlighting various aspects of pottery manufacture from the procurement of raw materials to pyrotechnology. The results are summarized and compared to other previously studied localities in the region, in turn demonstrating how the Sexton Site can make an important contribution to understanding the prehistory of south Florida and beyond.

**Friberg, Christina (Indiana University Museum of Archaeology and Anthropology), Elizabeth Watts Malouchos (Illinois State Archaeological Survey) and Edward Herrmann (Indiana University Museum of Archaeology and Anthropology)****[52]***Assessing Complexity through Architectural Analysis at Angel Mounds*

Angel Mounds (12VG1) is a fortified Mississippian multi-mound center on the Ohio River in Vanderburgh County, Indiana. With 11 mounds, hundreds of residential structures, a prepared plaza, and massive daubed palisade wall, previous researchers have suggested Angel is at the top of a complex regional settlement hierarchy in the Ohio Valley. However, to-date, research has concluded that there is little evidence for hierarchy off of the site's mounds. Recent detailed analysis of size, shape, orientation, internal features, and reconstruction episodes of architecture from Glenn A. Black's WPA era excavations demonstrates distinctions indicative of a more complex social organization than previously thought. Comparisons with regional hinterland sites provide further evidence of complex socio-spatial practices that enacted regional integration across the Angel polity. In this paper, we present recently digitized architectural data from Angel Mounds that reveal details and variation overlooked by previous analyses, and discuss our results within the context of region-wide architectural patterns.

Friberg, Christina [97] see Krus, Anthony

Friberg, Christina [52] see Massey, David

**Friend, Sadie (CSU Chico), Ashley McKeown (Texas State University, San Marcos) and Emilie Wiedenmeyer (Texas State University, San Marcos)****[32]***Evaluating the Applicability of the Coimbra Method on an Archaeological Sample from Sint Eustatius*

To uncover details of past people's day to day life, bioarchaeologists have attempted to reconstruct possible activity patterns by

examining changes that occur at musculoskeletal markers, called enthesal sites (ES). While there is general agreement about the overall effect of confounding variables on entheses, there are discrepancies regarding the degree to which these variables affect enthesal change (EC) and the true association between activity level and EC. The objectives of this study include (1) analyzing the presence and severity of enthesal changes in the upper limbs of individuals excavated from an unmarked, presumably slave cemetery from the eighteenth century on the coastline of Sint Eustatius; (2) evaluating the applicability of the Coimbra Method (Henderson et al. 2013, 2016) to a small archaeological sample; and (3) assessing the possible scoring error of this EC method. This study found that the majority of recorded EC occurred on M. biceps brachii and that males are more likely to exhibit EC. The results of this study also suggest that this method faces challenges in repeatability, archaeological applicability, and inexperienced observer use.

**Fries, Eric (UNLV)**

**[22]**

*The Desakota as a Model for Understanding Dense Urban-Agrarian Settlement among the Ancient Maya*

Large-scale surveys using lidar and other remote sensing technologies have revealed that Maya urban centers were much larger in both settlement area and number of features than previously thought, while also incorporating various forms of large-scale anthropogenic landscape modification for the purposes of intensive agricultural production. These findings challenge the existing models for understanding Maya urbanism. The concept of the "desakota," used in urban geography to describe densely populated urban/agrarian mixed-use areas in Southeast Asia, is employed here to understand these newly recognized attributes of Maya settlement. Settlement data from the Aguacate region in western Belize is used to demonstrate the applicability of the desakota model to a Maya case. The pattern in this region consists of widely distributed, patchy settlement with numerous small monumental sites and continuity with the outlying settlement of adjoining larger centers. This pattern may be better explained by the desakota model than by descriptors like "peri-urban zones," "hinterland," or "low-density urbanism" that have been applied previously.

**Fries, Eric (UNLV)**

**[56]**

*Discussant*

**Friesen, Max (University of Toronto) and Pamela Hakongak Gross (Pitquhirmikuk Ilihautiniq / Kitikmeot Heritage Society)**

**[179]**

*Pitquhirmikuk Ilihaqta: Learning about Our Culture*

Archaeology in Inuit Nunangat (northern Canada) has a long and varied history of interactions between Inuit communities and "southern" researchers. This paper is about one long-standing example of a successful relationship between an Inuit organization, the Pitquhirmikuk Ilihautiniq / Kitikmeot Heritage Society (PI/KHS) of Cambridge Bay, Nunavut, and a southern institution, the University of Toronto. Beginning in 1999, the PI/KHS initiated a series of collaborative projects that combined recording of elders' oral histories and exposure of youth to Inuit heritage with archaeological fieldwork designed to answer fundamental questions about the history of Inuit who live within Inuit Nunangat. This relationship has morphed over the years, and continues today with several new projects. In this paper, we will attempt to outline how the project has been organized, how each group has tried to ensure that its activities support the other, and how it has changed over time. While we do not believe that there is a "one size fits all" recipe for how these partnerships can work, we hope that the paper may include a few useful insights as we all seek to unearth more about Arctic archaeology.

**[179]**

*Chair*

**Frutos, Alberto and María Vasquez**

**[63]**

*Trabajos de recorrido de superficie y excavación en el sitio Santa Lucía 1, resultados preliminares de un hueco regional en la arqueología del noroeste de la cuenca de México*

Se hará una revisión de los antecedentes arqueológicos en la zona, donde el principal asentamiento corresponde al islote artificial de Xaltocan, de filiación otomí, y cuya fundación data del periodo Posclásico temprano y se reconoce por la presencia de cerámica azteca I y II, sin embargo, en el Proyecto de Salvamento que se ejecutó como consecuencia de la construcción de un nuevo aeropuerto internacional en el altiplano central, se nos permitió el acceso a un predio de más de 3 mil hectáreas que al albergar instalaciones militares nadie había podido recorrer ni excavar arqueológicamente hasta el momento. Oportunidad que abrió una ventana que enriquece el conocimiento regional y ha permitido la recuperación de evidencias de asentamientos desde el clásico y el epiclásico del cual no se tenía registro.

**Fryer, Tiffany (Princeton University)**

**[75]**

*Discussant*

**Fryer, Tiffany (Princeton University)**

**[86]**

*From Critical to Substantive Heritage Practice*

Over the past two decades, the Critical Heritage Studies Movement (CHSM) has spurred a sea change in archaeological, anthropological, and historical approaches to the study of heritage. CHSM scholars interrogated the underlying assumptions of the growing heritage industry, including how places and objects designated as heritage were then conferred an unearned status as innately valuable. These interventions have been vital. In this essay I argue, however, that the CHSM has trapped itself in a

proliferation of studies steeped in descriptive criticism but lacking in avenues for substantive action. I find Ann Stahl's recent call for archaeologists to shift their focus to making the discipline more effective rather than more relevant motivating. I am also enthused by recent US-based legal movements seeking substantive rather than formal equality in American law. Thus, I will draw on a series of examples pulling from my own research in southeastern Mexico as well as other research from throughout the Americas to outline mechanisms for taking what we have learned from CHSM and applying it to an effective—substantive—archaeological heritage practice.

**Frykholm, Soren (Proyecto Arqueológico del Conjunto Monumental de Atzompa), Nelly Robles García (PACMA/INAH), Rebeca Aguilar (PACMA/INAH), Dante García (PACMA/INAH) and Damian Martínez Torres (PACMA/INAH)**

[82]

*Hallazgos de la excavación de una habitación residencial de la época IIIB/IV en Atzompa, Oaxaca, México*

Atzompa, es un asentamiento satélite de las élites de la capital zapoteca, alcanzó su apogeo y población máxima durante la Época IIIB-IV de Monte Albán (500–900 dC). Al igual que en Monte Albán, el sitio parece haber sido abandonado en algún momento al final de esa época. Desde 2007, el PACMA (Proyecto Arqueológico del Conjunto Monumental de Atzompa), dirigida por la Doctora Nelly Robles García, ha estado excavando este sitio arqueológico, que cuenta con varios complejos de edificios alrededor de plazas; un complejo funerario, y dos grandes unidades residenciales ya totalmente excavadas y ahora restauradas. Durante 2019 el PACMA realizó una excavación al lado del Edificio Funerario en el Cuarto 3. Este cuarto está adosado a la fachada norte del Edificio (al extremo Oeste de la fachada norte) y colinda en su muro oeste con la Casa de los Altares. Dado esta ubicación, el cuarto ocupa un lugar bastante central dentro del complejo residencial que lo rodea por los lados norte y oeste, y presentó materiales importantes. Esta ponencia discute la probable función del recinto dentro del complejo Edificio Funerario/Casa de los Altares.

**Fuchs, Christopher (Washington College)**

[37]

*The Virtuous Archaeologist*

Archaeology is a scientific profession critical to understanding the story humans have written on the world over the course of our history. However, unlike many areas of scientific study, the “subjects” of that scientific inquiry are ultimately people, leading to a complex system of ethics surrounding the treatment of evidence and its place in the archaeological story. The ethics of telling that story are not only the archaeologist's job but also must guide our choices on how data is gathered, what is done with it, and how we interact with living communities. Three virtues, already present in archaeological practices, could provide comprehensive moral guidance to the story we tell of the past as well. Whether we gather enough information to tell a more complete story as we understand it contributes to integrity. Thoughtful representations of past people and ensuring their legacy remains protected help the profession to be just. Ensuring that the voices of past peoples' descendants are heard, as they have knowledge of their ancestors' culture necessary to tell a more complete story, could be termed professional collaboration. These virtues can provide moral guidance toward a method of archaeology that flourishes as a science of people, by people, for people.

**Fulkerson, Tiffany (Washington State University) and Shannon Tushingham (Washington State University)**

[144]

*Making the Data Count: Analyzing Inequities and Challenging Epistemic Injustice in Archaeological Discourse*

The recent resurgence of interest in diversity and equity issues in archaeological practice highlights persistent disparities in the demographic composition of practitioners in various aspects of the discipline. Drawing from a database that we generated on the gender and occupational affiliation of 5,010 authors of 2,445 articles in six regional and national publication venues, we demonstrate that men and individuals in academic settings continue to dominate discourses in North American archaeology, particularly in the more prestigious publication venues. We further document considerably higher representations of women and compliance archaeologists in non-peer-reviewed publishing forums. We frame our results within the context of the “leaky pipeline” effect for women, and the cost-benefit realities of publishing for people who occupy different professional sectors of archaeology. Insights into the methodological difficulties of analyzing equity and diversity in the sciences, as well as problems with conventional measurements of “success” in the modern professional era of North American archaeology, are provided. We conclude by offering realistic and nontraditional strategies for reducing epistemic injustice in the contemporary landscape of knowledge dissemination.

**Fulkerson, Tiffany (Washington State University)**

[190]

*Discussant*

Fuller, Reba [7] see Hull, Bryna

**Fulminante, Francesca (Bristol University), Luce Prignano (University of Barcelona), Sergi Lozano (Institut Català de Paleoeccologia Humana i Evolució Social) and Emanuele Cozzo (University of Barcelona)**

[92]

*Roads and Rivers: The Importance of Regional Transportation Networks for Early Urbanization in Central Italy*

Ancient regional routes were vital for interactions between settlements and deeply influenced the development of past societies and their “complexification” (e.g., urbanization). For example, terrestrial routes required resources and inter-settlement cooperation to be established and maintained, and can be regarded as an epiphenomenon of social interactions. Similarly, navigable rivers provided a complementary inter-settlement connectivity, which conditioned the development of roads and pathways. In this sense, fluvial and terrestrial connections can be seen as the two layers of an integrated regional transportation system, which was the product of

social relations and of the interplay between past societies and environment. This paper discusses transportation networks and interactions in central Italy (1000–500 BC) at a time of changes and developments in the Italian Peninsula, which led to the creation of regional ethnic and political groups and to the formation of the first city-states in Western Europe. To better understand emerging Latin and Etruscan urban polities and the mechanisms underlying their variable success, we adopt a novel network approach (modeling and multiplex networks). The results shed new light on how Latin and Etruscan polities emerged and functioned, and also suggest potentially why in the end Rome prevailed over its rival.

**Fulton, Deirdre**

[70]

*Faunal Remains from Medieval San Giuliano Plateau*

A large number of faunal remains were uncovered during the four seasons of excavation (2016–2019) at the San Giuliano Plateau (SGP), Italy. The collection consists of species that are typical to inland sites in the northern Mediterranean during the Medieval period, specifically sheep, goat, and pig. Birds and cattle also supplement the diet. These faunal remains were collected from the interior of a monumental building that sits on top of SGP as well as stone pits located to the west of the building, dating to the eleventh through mid-thirteenth centuries CE. The pit excavations brought to light a distinctive distribution of faunal remains, including a large number of partial or complete rats. Based on the lack of gnaw marks on other bones in the pits and the large number of complete rat skeletons found in the pits, it is most likely that the rats were exterminated and then dumped into the pits. The number of rats (NISP) and context in which they are found may indicate the practice of rat venery taking place at SGP.

Fulton, Deirdre [94] see Forste, Kathleen

**Furlong, Julia (Arizona State University), Jerry Galm (Eastern Washington University) and Stan Gough (Eastern Washington University)**

[5]

*Bayesian Analysis of Radiocarbon Assays from the Late Paleoindian Sentinel Gap Site*

Bayesian analysis of eight calibrated radiocarbon dates from the Sentinel Gap site (central Washington) is presented. Application of a Bayesian framework provides a method of reassessing uncertainty in the age-range provided by this suite of assays. The Bayesian chronology generated through this analysis establishes a higher resolution temporal placement for late Paleoindian occupation of the Sentinel Gap site. More precisely dated intervals of site occupation and landform development help clarify emerging adaptive strategies of regional late Paleoindian occupations. Calibrated intervals obtained through the application of a Bayesian model have the ability to elucidate culture-climate relationships during the transition out of the Younger Dryas cold phase into the extreme aridity of the early Holocene.

Furquim, Laura [66] see Wyatt, Andrew

Gagnon, Celeste [159] see Sutter, Richard

Gaikwad, Nilesh [51] see Lambert, Shawn

**Gallaga, Emiliano (UNACH) and Manuel Parra (EAHNM, Chihuahua)**

[65]

*Ceramics from a Presidio: Preliminary Results from Presidio San Carlos, Chihuahua*

Despite the distance and how isolated the Presidio was, it did not cease to belong to the globalized colonial economic sphere. The paper will present the first results of the study of the ceramic materials of the Presidio de San Carlos Archaeological Project (PAPSC). It is a project of historical archaeology on the northern border of the state of Chihuahua, where a large amount of surface ceramic material was recovered, among which important representative types of the colonial era (eighteenth century) were identified. Some of those types are majolicas, green and red glazes, some Chinese types, and some other ceramic types that are highly likely to be locally manufactured and show the interaction with local communities.

[65]

*Chair*

**Gallagher, Joanne, Michael Padian, Abby Barrios and Brianna King**

[19]

*Green Rush Archaeology: An Overview of Cultural Confirmation and Economic Opportunities*

In November 2016, California passed the Adult Use of Marijuana Act (Proposition 64) to legalize the recreational use of cannabis. As a result, local county governments enacted their own county ordinances for Cannabis Legalization. In Humboldt County, in compliance with the Commercial Medical Marijuana Land Use Ordinance (CMMLUO) Cultivation Application checklist (version 2.0) an Archaeological, Paleontological, Tribal Cultural Resource Survey prepared by a qualified archaeologist must be completed for every Cannabis permitting application. For nearly four years, cannabis legalization has not only provided adequate studies into the environmental impacts associated with this cash crop, but allowed further archaeological analysis to assist in reaffirming local tribal histories while providing tribal members, recent graduates, and seasoned archaeologists a unique work experience and economic opportunity. In Humboldt county and others across the state, this process has enabled archaeological research among thousands of private land holdings without any previous, formal archaeological survey. This has opened a door into the land's rich cultural history,

offering new, bountiful information to reinforce the traditions and ethnographic records of a world nearly abolished by the physical and cultural genocides of America's western expansion.

**Gallagher, Martin (University of North Texas)**

[70]

*Ancient Roads in the Territory of San Giuliano*

This paper discusses the evidence for Etruscan and Roman roads in the territory of San Giuliano and evolving strategies for control of the surrounding landscape. Road survey conducted as part of the San Giuliano Archaeological Project (SGARP) has problematized prevailing conceptions derived from literary sources and more limited archaeological knowledge about the Ancient political organization of Southern Etruria. Rock-cut Etruscan roads connected the site to key centers on the Tyrrhenian coast and in the Tiber Valley, as well as to an important transcontinental route to the north. The identification of defensive works along these roadways, designed to protect San Giuliano, suggest its independence until the late fifth century BC. Likewise, connections with intermediate sites reveal the importance of its immediate region, situated between the Tyrrhenian Sea and the Tiber valley within the modern prefecture of Viterbo. A late fifth-century road directly connected the major coastal site of Cerveteri to San Giuliano, and was partially reutilized by the Roman Via Cassia in the third century BC. Combined with materially attested trade connections, and data from the new excavations at San Giuliano, studying the features of Etruscan and Roman roads can improve our understanding of political and economic history in South Etruria.

**Gallareta Negron, Tomas (INAH Mexico) and Rossana May Ciau (Kaxil Kiuic A.C.)**

[71]

*Landscape and Settlements in the Bolonchen District, Puuc Region, Mexico*

This paper combines the results of settlement and vegetation surveys in the Puuc Region of Yucatán, Mexico, with an emphasis in the Bolonchen District and the archaeological Maya site of Kiuic. The extensive settlement study conducted by members of the Bolonchen Region Archaeological Project, based on lidar technology, allowed us to realize the intensity in the interaction of natural resources as soils and limestones with the ancient communities. This resulting information is used for analyzing the distribution of functional types of trees and for observing how they correlate with intensity of occupation, the main landforms, and archaeological features related with the main economic activities: extensive seasonal agriculture and the procurement and transformation of limestone.

**Gallenstein, Gwenn (National Park Service)**

[110]

*Discussant*

**Gallivan, Martin (William & Mary) and Jessica Jenkins (University of Florida)**

[163]

*Deep History, Colonial Encounters, and Revitalization in the Algonquian Chesapeake*

This paper explores the idea that the Powhatan paramount chief's relocation to the town of Werowocomoco represented an act of revitalization intended to renew the power of a ceremonial place. Studies of revitalization movements often trace a historical process of social stress, cultural distortion, and reformulation of cultural patterns through revival or reaffirmation of selected features. The archaeological record of Werowocomoco, the capital of the Powhatan chiefdom when colonists arrived in the Chesapeake, aligns with elements of these models. Prior to the colonial era, two phases of earthwork construction at Werowocomoco mark the town as a place of ceremony, followed by significant population decline at the settlement during the sixteenth century. European colonists periodically visited the Chesapeake and established a missionary outpost near Werowocomoco during this period, likely introducing deadly diseases into the region. Also during this century, paramount chief Wahunsenacawh moved his residence to Werowocomoco—a town that may no longer have had any resident population—as he consolidated control over a regional polity. Seeing Werowocomoco as the center place of a revitalization movement offers a new way of reconnecting Virginia Algonquians' deep history and the events of the colonial encounter.

[163]

*Chair*

Galm, Jerry [5] see Furlong, Julia

**Galván Benítez, Miguel Angel**

[82]

*El sistema de desagües del Juego de Pelota de Monte Albán*

La recolección y almacenamiento de agua pluvial es una de las prácticas más antiguas en Mesoamérica. La investigación arqueológica en diversos sitios ha permitido la identificación y documentación de depósitos subterráneos, depósitos a cielo abierto, almacenamiento en recipientes y más común el sistema de desagües. En Monte Albán los estudios arqueológicos sobre el aprovechamiento del agua de lluvias no ha sido extenso, sin embargo, el "Proyecto Emergente de Restauración por los efectos de los sismos del 7, 19 y 23 de septiembre del 2017 de la Zona Arqueológica de Monte Albán" ha permitido identificar, estudiar y restaurar el sistema de desagües del Juego de Pelota. En la presente ponencia se exponen valiosos datos sobre la captación, distribución y usos de las aguas pluviales en la parte noreste de la plaza principal, dando cuenta de cómo la planeación urbanística de Monte Albán, en este caso tuvo un objetivo dual; por una parte, coadyuvar en el problema del abastecimiento de agua y por el otro, evitar las posibles inundaciones de los espacios públicos.

**Gama-Vooz, Marisol (Gama-Vooz)****[65]***Gamble across the Rio Grande: Industrial Archaeology of the Aerial Ore Tramway in the Big Bend*

In the 1900s a group of adventurous entrepreneurs resumed mining activities that had been abandoned a decade prior in the Big Bend region. The idea this time was to utilize new mining technologies. Overcoming long distances, rugged terrain, and international and cultural borders, an expensive and new mineral transport system known as an aerial ore tramway, which spanned six miles across the US/Mexico border, was installed. The installation of the aerial tramway and its towers and cables became central to the developmental boom in the Rio Grande/Rio Bravo region. It brought a decade of transformations to the landscape including the mobilization of a new workforce, new communities, economic investment, and the bridging of the Sierra del Carmen of Mexico with the Terminal Valley of the United States. However, only a few years after the second life of mining in the Big Bend region, it fell into oblivion again. Today, the wobbly towers of the aerial tramway stand in what is now Big Bend National Park as a reminder of the industrial landscape that once thrived in this strikingly tough region.

**Gamble, Lynn (University of California, Santa Barbara)****[60]***Discussant*

Gamble, Lynn [144] see Herr, Sarah

**Garbellano, John Michael****[153]***Changing Tides and Terrain: Dr. Mary Butler's Hudson Valley Archaeological Survey*

Consistent demonstration of patience and fortitude are characteristics of the most revered pioneers in human history. These qualities were seen in many individuals blazing new paths for others to follow. Directly or indirectly, those who created these paths helped improve the overall state of humanity in the Americas. Knowingly or unknowingly, Dr. Mary Butler was an agent of change in the discipline of anthropology. And she is worthy of the veneration many great pioneers have received. This paper focuses on the life and career of Dr. Butler and, more specifically, her archaeological survey of the Hudson Valley in New York. Her seminal project was misrepresented by colleagues of her time but by no means forgotten. Dr. Mary Butler is an icon of many firsts for women in anthropology. Her work has influenced the careers of many and has the potential to continue to do so for years to come.

Garcia, Lorena [66] see Silva, Fabiola

**García, Dante (Zona Arqueológica de Monte Albán) and Nelly Robles García (INAH-México)****[82]***Iconografía Zapoteca en los tableros doble escapulario de la Casa Sur del Conjunto Monumental de Atzompa*

En los sistemas de escritura precolombina de Mesoamérica, la zapoteca se conoce principalmente por los diversos estudios realizados en el desciframiento de estelas, pintura mural y vasijas cerámicas que han permitido conocer importantes informaciones sobre las élites político-sociales, sus alianzas matrimoniales, rituales funerarios, culto y veneración a los ancestros, así como las genealogías de diferentes ciudades del clásico tardío y postclásico temprano (650–1250 dC). En esta ponencia se presentan los recientes descubrimientos y aportes sobre los sistemas de lectoescritura zapoteca, ya que en las temporadas 2018–2019 del Proyecto Arqueológico del Conjunto Monumental de Atzompa se descubrió un friso con bajorrelieves que complementa un tablero tipo doble escapulario que decora la fachada principal de la residencia conocida como Casa del Sur. Este tablero, único en su tipo, presenta una narrativa gráfico-discursiva que conserva el sistema pictográfico zapoteco, por lo cual, se presenta una propuesta de lectura semiótica contextual que permiten sugerir la función de este recinto e importancia del mismo en la consolidación del poder político-económico de Atzompa dentro del conjunto urbano de Monte Albán.

**[82]***Chair*

García, Dante [82] see Frykholm, Soren

García, Dante [82] see García Lalo, Luis

García, Dante [82] see Martínez Martínez, Xóchitl

García, Percy [69] see Weber, Sadie

García-Des Lauriers, Claudia [101] see Des Lauriers, Matthew

García-Díez, Marcos [53] see Fábregas Valcarce, Ramón

**García Lalo, Luis (INAH Oaxaca), Nelly Robles García (INAH Oaxaca) and Dante García (INAH Oaxaca)****[82]***Análisis de la arquitectura de tierra en el Edificio "P" de la Zona Arqueológica de Monte Albán*

La utilización de la tierra en los sistemas constructivos es el método más probado por la historia y el más antiguo empleado por el



hombre para formar sus edificaciones, ya que es un material abundante y versátil para la construcción. Los antiguos zapotecos alcanzaron un gran desarrollo de la técnica constructiva a base de tierra y la implementación de modelos sísmicos para la construcción de edificios con características monumentales de Monte Albán. A partir de los trabajos arqueológicos en el edificio "P", dentro del Proyecto de Conservación de los Edificios Dañados por los Sismos del 2017 en Monte Albán-Atzompa, se han revelado datos arquitectónicos que nos permiten visualizar el desarrollo técnico de la utilización de la tierra empleando diversos procesos de manufactura, mostrándonos formas novedosas de la utilización de este material.

**García Piedra, Sergio**

[178]

*Nuevos datos sobre los colgantes de lapidaria verde y sus contextos arqueológicos en Costa Rica*

El Museo del Jade y de la Cultura Precolombina del Instituto Nacional de Seguros, exhibe 2040 piezas arqueológicas de piedras verdes (*jades*). A pesar de la limitada información contextual, posee un gran potencial para comprender la manufactura y uso de los colgantes de piedras verdes en Costa Rica. A partir de la última clasificación realizada por Waka Kuboyama (2018), el Museo del Jade realizó un convenio con la Universidad de Costa Rica y el Museo Nacional de Costa Rica para desarrollar un proyecto conjunto de investigación de colgantes y contextos arqueológicos. Se han realizado dos investigaciones con resultados novedosos, el primero se hizo en colaboración con el Centro de Investigación en Ciencia e Ingeniería de Materiales de la UCR. Se analizaron 126 colgantes con equipos portátiles de Espectroscopía infrarroja y Espectrómetro Raman y estos permitieron identificar 5 grupos composicionales. El segundo identificó un sitio arqueológico que pareciera ser un taller de colgantes. El sitio se ubica en una quebrada de agua termal y se identificaron 63 rocas con afiladores y/o petroglifos. En las muestras de suelo recolectadas se identificó granos de Forsterita ( $(\text{Mg,Fe})_2\text{SiO}_4$ ) del grupo de los olivinos (relacionada a serpentinas) de coloraciones verdes, cafés y amarillas.

**Garcia-Putnam, Alex (University of Wyoming), Christine Halling (Louisiana Department of Justice) and Ryan Seidemann (Louisiana Department of Justice)**

[20]

*From Person to Specimen: Exploring the Necroviolence of Medical "Progress" from Charity Hospital Cemetery #2, New Orleans, LA (1847–1929)*

Charity Hospital, which operated from the eighteenth century until Hurricane Katrina in 2005, served New Orleans's poorest citizens. During the nineteenth and early twentieth centuries, the remains of many individuals who died at the hospital were used for medical dissection and autopsy. A collection of commingled skeletal remains associated with one of the Charity Hospital cemeteries shows evidence of the anatomization of these individuals. The sample (~1,000 fragments, MNI = 61) contains elements with standard autopsy cut marks, as well as nonstandard cut marks associated with either dissection, experimentation, or less-practiced student mistakes. Through an analysis of skeletal indicators of biological stress, we also see the embodiment of structural violence that these individuals faced in life etched onto their remains. Borrowing De León's (2015) concept of necroviolence, we explore their (mis)treatment in death as a form of subjugation and structural violence, which was echoed by the inequalities they faced in life.

Garcia-Putnam, Alex [147] see Smith, Maria

García Wiguera, Eduardo [82] see Martínez Martínez, Xóchitl

**Gardner, A. Dudley (Western Wyoming College)**

[192]

*A Look at the Formative in Northwestern Colorado: Similarities and Differences in the Cultural Assemblages within the Fremont in the Colorado River Drainage Basin*

Recent excavations in Northwest Colorado indicate that between 1100 BP and 800 BP, some Fremont structures in the area contained elements similar to sites found throughout the upper Colorado Plateau. Adobe rimmed hearths, grass and cedar in roof construction, and rock slab coverings on roofs are evident in Northwest Colorado and elsewhere. The question is, why? To what degree do the Northwestern Colorado Formative period assemblages differ from elsewhere? For instance, there seems to be a lack of beans and squash in the macro-floral record south of the White River in Northwestern Colorado. Yet, granaries and other structures are similar to those found throughout the upper Colorado Plateau. In this presentation, we will compare and contrast what we have found in excavation and surveys to the cultural assemblages exhibited elsewhere. We will then provide a brief explanation for what appears to be a divergence from established Fremont cultural attributes in Northwest Colorado.

[192]

*Chair*

Gardullo, Paul [146] see Lubkemann, Stephen

Garrett, Timothy [1] see Duffy, Lisa

**Garrido, Francisco (Museo Nacional de Historia Natural)**

[157]

*Decentralized Negotiation and Imperial Flexibility in the Margins of the Inca Empire*

Marginal imperial regions are places where more flexible modes of dominion can be expected, where distinctions between state

impositions and local appropriation of imperial infrastructure and material culture are less clear. Particularly in regions with decentralized polities, political negotiations are far from homogeneous, resulting in heterogeneous modes of integration to imperial rule. The Copiapó Valley is located at a far distance from the capital of the Inca empire, at the southern edge of the Atacama desert. During the Late Horizon, its population was politically decentralized and resided in various independent villages. Each of the chiefs negotiated individually with the Inca empire, resulting in the uneven Inca interventions in the local settlements. This decentralization can be seen at various levels, in terms of the distribution of Inca material culture, and also in the economic reorganization of the valley, where metallurgical production was inserted within a wide network of primary facilities and artisan workshops across both sides of the Andes. Thus, this case is relevant to understanding the challenges of consolidating imperial power in the southern Collasuyu and the potential for local agency to negotiate their integration into the Inca political project.

Garrison, Thomas [119] see Beach, Timothy

**Garvey, Raven (University of Michigan)**

[162]

*Discussant*

**Garvin, Arianna (University of California, San Diego), Paul Goldstein (University of California, San Diego) and Jade d'Alpoim Guedes (University of California, San Diego)**

[182]

*The Implications of Amaranthaceae Cultivars at the Tiwanaku Site of Cerro San Antonio, Locumba, Perú*

The Tiwanaku civilization (ca. AD 500–1100) originated in the Bolivian Altiplano (3,800 m asl) of the south-central Andes and grew frost-resistant crops, such as quinoa (*Chenopodium quinoa*), kiwicha (*Amaranthus caudatus*), and potatoes (*Solanum tuberosum*). Throughout the Middle Horizon (AD 600–1100), the Tiwanaku expanded into Peruvian coastal valleys (~900 to 2,500 m asl), like the Locumba Valley, which are areas suitable for growing maize (*Zea mays*). The Tiwanaku valued maize because it could be brewed into chicha, an alcoholic beverage significant in ritual activities and feasts (Goldstein 2005). Because maize explains Tiwanaku expansion, dietary investigations at Tiwanaku colonial sites (Somerville et al. 2015) largely focus on maize. To broaden their focus beyond maize, this paper encourages archaeologists to include paleoethnobotanical (PEB) studies in their food-related investigations. This paper presents preliminary PEB findings from samples excavated from multiple household units at the large Tiwanaku residential site of Cerro San Antonio (L1), Locumba, Peru. Interestingly, PEB analyses highlight the importance of Amaranthaceae cultivars at L1, which are crops native to the Andes. The high concentrations of Amaranthaceae seeds at L1 continue to support the narrative of Tiwanaku expansion and suggest that the Tiwanaku colonists maintained strong connections to their homeland in the Altiplano.

Garzon, Andres [149] see Martinez, Valentina

**Gaspar, Karla (California State University, Fullerton), Juan Chavez (University of California, Riverside) and Sara Becker (University of California, Riverside)**

[106]

*Practicing Communities and Experimental Bioarchaeology: A Look at the Tiwanaku (AD 500–1100) and Their Descendant Communities in Bolivia*

Using ethnographic interviews and experimental (bio)archaeology, over 20 individuals participated in this research to look for movement similarities between their modern labor and tasks their Tiwanaku ancestors likely performed, as shown by skeletal enthesal/muscle attachment changes and osteoarthritis. We used 3D computerized motion capture (mocap) to record women and men performing generalized tasks like farming, grinding, or *chuño* (freeze-dried potato) production, and specialized crafting of pottery or woven items. Interviews focused on physicality, such as handedness, pain, and hours to create a finished product, and on information about apprenticeship relationships such as who had trained them, whom they trained, and how long it took to learn these skills. We found that the best interviews and data were collected when these experts invited us into their Communities of Practice (CoPs)—a process during which we as anthropologists came to experience membership in an emergent CoP through non-textual knowledge production. While the analyses of skeletal comparisons to these tasks is ongoing, initial findings show patterns on the skeletons of Tiwanaku peoples which correspond to specific aspects of craft production, such as the use of a drop spindle for weaving.

**Gassaway, Linn (USFS Lassen National Forest)**

[165]

*Discussant*

**Gates St-Pierre, Christian (Université de Montréal), Jean-Christophe Ouellet (Université de Montréal) and Claude Chapdelaine (Université de Montréal)**

[103]

*To Live in a Longhouse: A Case Study from Iroquoian Village Sites in Southern Quebec*

Archaeologists have been largely interested in documenting the architecture, variability, evolution, and even the symbolism of Iroquoian longhouses for several decades in the Northeast, often using the village or the region as the preferred scale of analysis. However, the study of daily life inside these longhouses has not received the same attention; for example, in regard to the

organization of labor or the emergence of inequalities, among other social dimensions. This presentation will adopt a different, smaller scale of analysis to address these issues through a series of inter- and intra-longhouse comparisons from Late Woodland Iroquoian village sites located in St-Anicet, southern Quebec.

Gayo, Eugenia [114] see Ugalde, Paula

**Gentil, Bianca (Pennsylvania State University)**

[177]

*The Epiclassic outside of the Basin: Measuring Population and Settlement Dynamics in the Puebla-Tlaxcala Valley, Mexico*  
Shared characteristics between settlements create the archaeological classification of the "Epiclassic" in central Mexico. These characteristics include rise in militarism, increase in long-distance networks, the upswing in regional centers vying for power, and a boost in art, architecture, and stylistic composition. Puebla-Tlaxcala experienced these changes that spread across central Mexico during the Epiclassic. The material culture throughout the landscape became more localized and heterogeneous—especially since the Puebla-Tlaxcala valley provides intersecting paths of trade between the Basin, Gulf, Mixtec, and Maya regions. García Cook's survey data has been used to analyze settlement distribution in the region, which leads to a narrative of population pressure competing for power, influence, and resources—as depicted in the battle mural at Cacaxtla. Though conflicts were likely present, recent surveys show that assumed population density is not exactly accounted for in most of Puebla-Tlaxcala. Epiclassic concentrations center between the settlements of Cholula and Cacaxtla and some occupation at the site of Tepeticpac and at the site of La Loma de Santa Margarita in the north end of the valley. This shortage of population density may help us understand the lack of known occupation in the region during the subsequent Early Postclassic period.

**George, Marianne (Pacific Traditions Society, Vaka Taumako Project, Royal Institute of Navigation)**

[121]

Moderator

[121]

Discussant

**George, Miranda (University of Calgary), Elizabeth Paris (University of Calgary) and Roberto López Bravo (UNICACH)**

[13]

*Size and Morphology of Canid Skeletal Remains from Moxviquil, Chiapas, Mexico*

The site of Moxviquil is located in the Jovel Valley of highland Chiapas, and contains a funerary cave from which human and faunal osteological remains have been recovered. The site's occupation spans the Late Classic (AD 600–900) to Early Postclassic (AD 900–1250) periods. Approximately one-third of the remains belong to the species *Canis familiaris*, represented primarily by dental elements. Canid teeth were used to identify the presence of both small coated dogs, or Techichi, and medium-sized hairless Xoloitzcuintli dogs, an ancient breed that was common to both Aztec and Maya cultures. Many of the canid teeth in this assemblage presented unique morphological features that are diagnostic of the Xoloitzcuintli. Measurements were taken on the height, breadth, and width of the crown (where possible) on all *Canis familiaris* teeth from the assemblage, and compared to specimens from complete canid crania in order to determine the average body size of each individual in the sample. The results were used to interpret the size and breed of the dogs represented in the sample. Maxillary first molar morphologies were used to identify both normal and abnormal cusp patterns suggesting that both Techichi and Xoloitzcuintli dogs were present at the site.

**Geurds, Alexander (University of Oxford) and Natalia Donner (Leiden University)**

[132]

*Long-Distance Interaction in Central Nicaragua: An Archaeological View on Local Practices and Globalizing Postclassic Trends*

Archaeological work on Greater Nicoya modeled perceived Postclassic changes in material culture by invoking foreign incursions and population displacement. At the eastern edges of Greater Nicoya, however, small-scale communities navigated the increasing flow of Mesoamerican cultural features through a social dynamic of active adaptation and participation in exchange networks beyond regional frontiers, rather than through patterns of migration and cultural homogenization. This paper presents results of multiyear investigations in central Nicaragua using recent work on globalization thinking in archaeology to show that this seemingly peripheral region took on an active role. Included herein are the import of pottery, innovation in vessel shapes following local materials and technical traditions, the adoption of specific culinary practices, the incorporation of obsidian in lithics repertoires, and the use of certain iconographic elements in rock art. In spite of this clear evidence of contact and trade, the relationships with Mesoamerica did not entail a fundamental transformation in local ways of making things and relating to the environment. Instead, the shifting interregional ties to southeastern Mesoamerica suggest that central Nicaraguan communities reimagined and reoriented objects and motifs, through a mix of adoption and adaptation, allowing a move beyond hypotheses of population displacements and ancient "Mexican" invasions.

**Ghavami, Sam (Université de Fribourg)**

[159]

*Thinking Transition: The Processes of Ethnogenesis*

The study of Andean prehistory divides broader cultural eras or horizons which have their own distinct and well-discernible characteristics; political and social structures and material and symbolic traditions. Between these eras of (relative) stability, scholars designate the more or less lengthy periods between them as transitional or intermediate periods. These periods of transformation are both the dusk of one culture or state of culture and the dawn of another. These periods raise questions that are

as difficult methodologically and theoretically as they are important. In the state of today's archaeology, they might be some of the most urgent. My own work focuses on the transitional phase that spreads from 850 to 950 CE and separates the Moche and Lambayeque on the northern coast of Peru, yet my hypothesis here is that parallels exist with the transition at the end of Chavín. In this paper, I will attempt to identify the elements from which to sketch the lineaments of a formal model in order to transcend simple diagnoses of fragmentation and seek to seize the coherence behind transition.

**Ghezzi, Ivan**

[159]

*Chankillo as a Fortification and Post-Chavín Warfare in Casma, Peru*

[WITHDRAWN]

**Ghidoni, Alessandro (University of Exeter)**

[185]

*Discussant*

Giardina, Miguel [175] see Morgan, Christopher

**Gibbs, Anna (Florida State University)**

[70]

*A Study of Medieval Intrasite Find Distribution on the San Giuliano Plateau, Lazio, Italy*

The San Giuliano Archaeological Research Project (SGARP) excavates a site in Lazio, Italy, known as San Giuliano. The medieval component of the San Giuliano site is a local manifestation of the widespread, but still poorly understood "*incastellamento*" process (the relocation of large parts of the medieval Italian population into defensible, fortified sites between AD 700 and 1200). This honors thesis presents a GIS analysis of artifact location and attributes within the medieval fortification excavation atop the San Giuliano plateau. By employing ArcGIS to run statistical analyses of artifact distribution patterns and their associated features within the medieval castle zone, analyses reveal artifact densities and patterning related to site use and refuse deposition throughout the fortification. The interrelationship of finds and archaeological features reveal key transitions in the use of space atop the fortified plateau. GIS analysis of the finds ultimately provides an integrated view of the spatial and social dynamics of an Italian castle and contributes to our understanding the wider process of *incastellamento*.

**Giffin, Sarah (Veterans Curation Program), Vanessa Armenta (Veterans Curation Program) and Leah Grant (Veterans Curation Program)**

[8]

*Veterans Curation Program in the Time of Corona*

Since 2009, the Veterans Curation Program (VCP) has been at the forefront of the effort to address the build-up of at-risk archaeological and archival collections in storage facilities around the United States. The VCP has the added mission of working with veterans to provide vital job skills and assist in the transition from military to civilian life. In cooperation with the US Army Corps of Engineers (USACE), the VCP hires veterans as laboratory technicians to rehabilitate and rehouse USACE-owned collections to preserve these collections and increase their accessibility to potential researchers. The 2020 COVID-19 pandemic created a unique challenge for the VCP, as its mission relies on one-on-one interaction and in-person learning. The VCP responded with creative adaptations to its operational structure and methods to allow for continued processing of USACE collections and skills training using social distancing and remote work. These adaptations enabled the VCP to maintain its original mission, while providing an alternative to traditional archaeological and archival processing methods. Managers and technicians at the VCP's San Mateo lab have participated in the adapted model, using creative methods of distanced presentation and digital processing to allow for safer collections work in the lab and at home.

Gil, Adolfo [175] see Morgan, Christopher

Gil, Adolfo [96] see Neme, Gustavo

**Giles, Bretton (Kansas State University), Brian Rowe (University of Memphis) and Ryan Parish (University of Memphis)**

[51]

*Symbolic and Iconographic Perspectives on the Burials from Mound 2 at the Hopewell Site*

This presentation explores the significance of the Middle Woodland burials found on the lower floor under Mound 2 at the Hopewell Earthworks, including their grave goods, mortuary furniture, spatial patterning, and postmortem treatment. It investigates how certain aspects of these burials' ceremonial regalia and funerary treatment might reflect Native American narratives regarding Sun and Morning Star, which have been associated with the Late Woodland/Mississippian Birdman theme. Accordingly, we illustrate how some of the ceremonial regalia interred with the burials from Hopewell Mound 2 were represented on a statuette from Mound City, which also has avian (falconoid) imagery emblazoned on its visage. Additionally, we discuss how Middle Woodland avian-anthropomorphic imagery appears to be associated with headless figures and/or decapitated heads, which could have some continuities with the subsequent (Late Woodland/Mississippian) Birdman theme. In this vein, we delve into the way the treatment of the burials from Hopewell Mound 2 might symbolically reflect these narratives, including the spatial organization of the charnel facilities, treatment of certain burials' skulls, and their interment with ceremonial regalia, such as sagittal copper head plates, quadricone plates, and beaded necklaces.

**[51]**  
Chair

Gilleland, Sarah [28] see Blank, John

**Gillespie, William (Unaffiliated)**  
**[79]**  
Discussant

Gilliland, Brandon [8] see Dewan, Eve

**Gilman, Patricia (University of Oklahoma)**  
**[60]**  
Discussant

**Gilmore, Eric, Maxwell Benning (Northern Arizona University), Mitchell Cleveland (Northern Arizona University), Chrissina Burke (Northern Arizona University) and Megan Laurich (Northern Arizona University)**  
**[26]**

*Let's Cut to the Chase: An Analysis of Experimental and Archaeological Data in the Process of Butchery*

This research identifies where taphonomic effects, specifically cut marks are found on zooarchaeological materials from both the archaeological and experimental contexts. Analysis of such taphonomic effects includes identification of similar patterning, placement of those marks between the archaeological record, and experimental research. This allows researchers to establish the human behaviors employed when producing cut marks. Faunal analysis for this project was conducted by Northern Arizona University, Department of Anthropology, Faunal Analysis Laboratory (NAUDAFAL) volunteers using standardized zooarchaeological methods. Additionally, clustering of cut marks, specifically placement on the element (proximal, distal, or shaft), and orientation (perpendicular or parallel to the element) were documented. Previous research suggests orientation and positioning of cut marks can be useful in identifying styles of butchery, specifically filleting or disarticulation. These studies, however, ignore data by solely using experimental information and ignoring archaeological evidence. By comparing the archaeological record to experimental studies, a more holistic examination of the process can be obtained and improve experimental design protocols useful in elucidating human behaviors from archaeological sites. We argue without evaluation of both experimental and archaeological data, the understanding of taphonomic effects would be nothing more than glorified quantification.

Gilmore, Eric [26] see Benning, Maxwell

**Gilmore, Kevin (HDR), Jonathan Hedlund (ERO Resources Corporation) and Bonnie Clark (University of Denver)**  
**[21]**

*Through a Glass, Darkly: Shedding Light on Late Prehistoric Obsidian Conveyance and Apachean Ethnogenesis on the Western Great Plains of North America*

Obsidian was technologically and symbolically important to the prehistoric inhabitants of western North America, and analysis of the small but diverse obsidian assemblage from the Bayou Gulch site (5DA265) in Colorado suggests both uses were important to the site's inhabitants toward the end of the Late Prehistoric period (AD 1000–1540). Chemical analysis identified New Mexico, Idaho, and Colorado sources, and the symbolic importance of obsidian is suggested by a small, unmodified and unknappable nodule of Colorado obsidian. These data reflect a contemporaneous pattern of increasing quantities of obsidian and shifts in source areas through time across the Plains. The ten-fold increase of obsidian from northwestern sources (Idaho and Wyoming) on the Plains after AD 1000 is thought to reflect obsidian-conveyance among proto-Apache Promontory culture groups who arrived in the eastern Great Basin and Western Plains ca. AD 1200. After AD 1450, obsidian from northwestern sources becomes scarce, suggesting disruption in the social network that supported conveyance between western and eastern kin-groups. This social disruption could be associated with expansion of Numic speakers east to the Plains margin. This attenuation of contact between geographically separated groups of proto-Apacheans ultimately led to the ethnogenesis of the modern Eastern and Western Apachean branches.

Gilstrap, William [171] see Crawford, Dawn

Glascock, Michael [171] see Breault, Sarah  
Glascock, Michael [30] see Crider, Destiny  
Glascock, Michael [171] see Frashuer, Anya

Glowacki, Donna [26] see Field, Sean

**Goebel, Ted (Texas A&M University)****[34]**

*Interpreting Technological Activities and Organization at McDonald Creek, Central Alaska, ca. 13,900 Calendar Years Ago*  
Continuing excavations at the McDonald Creek site, located in the Tanana Flats south of the city of Fairbanks, have yielded a significant assemblage of stone artifacts. Most of these come from a late Pleistocene cultural layer dating to about 13,900 calendar years ago, but smaller assemblages have also been derived from a Younger Dryas-aged cultural layer as well as a middle Holocene cultural layer attributed to the Northern Archaic. This poster presents the results of an ongoing analysis of these materials and, based on these data, interprets technological activities carried out by McDonald Creek's early human inhabitants. We also explore how these relate to technological-organization strategies, especially in the context of interpretations of settlement and subsistence organization being developed by other members of our research team.

Goebel, Ted [34] see Graf, Kelly

Goebel, Ted [52] see White, John

Goldberg, Sam [66] see Schmidt, Morgan

Golden, Charles [136] see Roche Recinos, Alejandra

**Goldner, Jonathan (University of Oxford)****[176]**

*Listening to Wood: Material Engagements with Sound and Trees*

This paper in cognitive archaeology studies how skilled agents use eco-acoustical features of the environment as mnemonic device. Beginning with the question, What do trees know about canoes?, I excavate how ways of knowing can be deeply sedimented in nature by drawing on the ethnography of Algonquin rock art and fieldwork with Algonquin birch bark canoe builders. The Algonquin demonstrate how natural sounds are fully canvassed for what they are capable of teaching us about how to live. Ultimately, I propose that the human mind may possess undeveloped sensory pathways that could be used to recover long-lost wisdoms by attuning to sonic resonances. Through sensory ethnography this research finds that it is possible listen to trees as they communicate many of the core procedural skills necessary for building an Algonquin canoe. This knowledge is absorbed (not imposed) into cognitive becoming through sensuous similarity with the materials, where the formal physical properties of materials serve to structure the audible signal that reaches the ear and manifest as an enduring interface. Listening to the material relations between trees and humans is essential for the transmission of whole bodies of cultural knowledge that are at risk of receding into quiet dormancy.

**Goldstein, Lynne (Michigan State University, Retired) and John Kelly (Washington University in St. Louis, Retired)****[153]**

*Harriet Smith, Educator and Archaeologist*

Harriet Smith worked at the Field Museum in Chicago for much of her long career. She was in the Education Department and focused primarily on teaching high school students about archaeology and other disciplines. However, this simple statement does not do justice to Harriet's contributions to and impact on archaeology. She was the first professional woman to direct archaeological excavations at Cahokia, she worked elsewhere in the Midwest, and she conceived and directed a summer program at the Field Museum in Chicago, focused on Anthropology for High School Students, initially funded by the NSF. The summer program ran for 20 years. This paper examines her contributions to Cahokia archaeology, as well as her contributions to educating and training several generations of archaeologists.

Goldstein, Paul [182] see Garvin, Arianna

**Golitko, Mark (University of Notre Dame)****[137]**

*What Do Archaeological Networks Reveal? Comparing New Guinean Material Culture with Ethnographic Network Structure*

Network analysis has become increasingly common within archaeological practice during the last decade, yet little consensus exists as to what networks based on material culture actually reveal about ancient social life. Archaeologists have variably interpreted communities or cliques derived from stylistic, technological, or provenience data as communities of practice, ethnic markers, or catnets. However, archaeological network practitioners have yet to offer a compelling linkage between material networks and anthropological and archaeological understandings of process and structure. I report on the results of a comparison of twentieth-century ethnographic material from the island of New Guinea with the structure of intercommunity ties as documented by over a century of intensive ethnographic research. The results show that underlying patterns of interaction do significantly structure material cultural patterning, but that the relationship is complex and does not allow for easy network reconstruction based on archaeological material. Nor does material culture clearly code ethnic or linguistic structure. This leaves open the question of what cultural and social significance shared material culture may index, and suggests that more sophisticated network inference algorithms may be required to construct meaningful networks from archaeological data.

Gomani-Chindebvu, Elizabeth [40] see Radican, Kelsey

Gomes, Ana [68] see Skosey-LaLonde, Elena

Gómez, Erika [181] see McCormick, David

**Gómez, Juliana (Universidad de Caldas), Jordan Dalton (American Museum of Natural History), Colleen O'Shea (Fine Arts Museums of San Francisco) and Noemi Oncebay (Universidad San Luis Gonzaga de Ica)**

**[128]**

*Death after Inka Expansion: Analyses of a Secondary Communal Burial at Las Huacas, Chincha Valley*

Mortuary Practices are political acts that are deeply embedded in political and social interactions. Complex N1 at the site of Las Huacas was the location of various burials during the Late Horizon (AD 1470–1532) and, possibly, early colonial period (AD 1532–1570). One such burial, was a large communal ossuary known as Feature 17. Feature 17 contains the remains of at least 42 individuals of various ages and sexes, and many elements show features of secondary mortuary rituals, including crania painted with red pigment, cut marks on bones, and vertebrae associated with reeds. This paper shares details from analyses of human remains, textiles, ceramics, and other artifacts included in the mortuary feature. These analyses shed light on both the individuals whose remains were deposited in Feature 17, as well as the rituals that surrounded their reinternment in Complex N1. The paper concludes by discussing what Feature 17 tells us about the terminal Late Horizon and/or early colonial period mortuary practices, as well as the larger sociopolitical contexts that surrounded the reinternment of these individuals.

Gonçalves, Célia [124] see Bicho, Nuno

Gonzales Gil, Patricia [128] see González Gómez de Agüero, Adrián

**Gonzalez, Albert (Cal State University - East Bay)**

**[190]**

*Discussant*

**González, Lorena (Proyecto Arqueológico Cuenca Mirador)**

**[48]**

*Excavaciones en el Grupo Saraguate, Complejo La Danta, El Mirador*

El Grupo Saraguate, está localizado sobre la segunda plataforma del Complejo La Danta que había sido fechado para el Clásico Tardío 600–900 dC. El Grupo Saraguate se caracteriza por contar por varios edificios de baja altura, que se distribuyen en aglutinadas plazas y patios, la presencia de entierros, y piedras de moler por lo que se consideran residenciales. Sin embargo, el conjunto Clásico había sido construido directamente encima de arquitectura Preclásica del Complejo La Danta, indicando la reutilización de arquitectura Preclásico por ocupantes siglos más tardes. Excavaciones han revelado nuevos datos de entierros y ofrendas con vasijas, cuentas de jade, conchas, fragmentos de cerámica tipo códice, cabezas y fragmentos de figurillas y piedras de moler.

Gonzalez, Nancy [65] see Howe, Mark

**Gonzalez, Sara (University of Washington, Seattle)**

**[57]**

*Discussant*

Gonzalez, Toni [100] see Aldana, Gerardo

**González Gómez de Agüero, Adrián, Francesca Fernandini (Pontifical Catholic University of Peru), Luis Ortega-San-Martín (Pontifical Catholic University of Peru) and Patricia Gonzales Gil (Pontifical Catholic University of Peru)**

**[128]**

*Green Epidote: Painting the Past in Cerro de Oro, a Chemical and Mineralogical Analysis of the Green-Yellowish Ceramic Pigment*

The following study proposes to analyze one of the most characteristic pigments of the Cañete Valley during the Middle Horizon period; specifically, the green-yellowish color in the Cerro de Oro ceramic repertoire. Defining the origin and use of this pigment allows for a better understanding of the access to raw materials and the operational chain in the manufacture of one of the ceramics that define this regional development. Ceramic fragments with the greenish pigment and epidote samples, both found at the Cerro de Oro archaeological site, have been used as samples for this study. To define the chemical and mineralogical composition of the pigment, XRF, Raman, and XRD analyses were carried out. These analyses have allowed us to identify epidote as the colored mineral, and its behavior at high temperatures suggests that this mineral could be related to the pigment found in the ceramics of the site.

González-Hernández, Galia [50] see Beramendi-Orosco, Laura

González-Hernández, Galia [50] see Soler-Arechalde, Ana

Gonzalez La Rosa, Luis Manuel [45] see Scaffidi, Beth

**González López, Angel (UC Riverside), Jeremy Coltman (UC Riverside), Karl Taube (UC Riverside) and Travis Stanton (UC Riverside)**

**[154]**

*Blood on the Stones: Heart Sacrifice and Sacrificial Altars in the Northern Maya Lowlands and Mexico-Tenochtitlan*

Heart sacrifice constituted one of the most basic yet fundamental tenets of Mesoamerican ritual practice. At Early Postclassic Chichen Itza, as with the later Aztec of Tenochtitlan, hearts and blood were offered to the bellicose solar deity whose daily journey through the sky not only depended on but also demanded such offerings. Heart sacrifice was also a creative act that invoked concepts of the world directions, centrality, and cosmic and royal renewal. This paper will explore heart sacrifice and sacrificial altars in the northern Maya lowlands, including the Puuc region, to create a comparative parallel with material from Mexico-Tenochtitlan. Archaeological, architectural, ethnohistorical, and iconographic evidence will be presented for these sacrificial altars, both in terms of where they appear and what is depicted on them.

González López, Angel [122] see Shiratori, Yuko

**Goodby, Robert (Franklin Pierce University)**

**[103]**

*Household Size and Organization at the Tenant Swamp Paleoindian Site*

Four well-defined Paleoindian house floors radiocarbon dated to 12,600 BP were excavated at the Tenant Swamp site in Keene, New Hampshire. Believed to be a winter occupation during the Younger Dryas, these dwellings were oval in shape and organized in defined zones with a central hearth, a defined work area, and an “empty” space along the outer wall of the dwelling that likely served as a sleeping area. Household size is estimated from the size of the sleeping area, and household economics are inferred from faunal remains and use-wear analysis of flaked stone tools. In contrast with other regional Paleoindian sites, there is little evidence at Tenant Swamp for hunting or fluted-point manufacture, but ample evidence for hide processing, woodworking, and other activities. The households at Tenant Swamp are contrasted with each other to assess variation in household size and activities, and comparisons are made with other well-defined Paleoindian dwellings in the northeast, notably from the Vail and Bull Brook sites.

**Goold, Kari and Daniel Perez (University of Nevada, Las Vegas)**

**[28]**

*An Experimental Approach to Understanding Virgin Branch Puebloan Ground Stone Technology on the Shivwits Plateau*

Ground stone use-wear analyses in the North American Southwest have been increasingly pursued through both collection studies and experimental approaches since at least the 1980s. Although analyses of prehistoric ground stone are common throughout all portions of the North American Southwest, experimental approaches to understanding ground stone technology in the greater region have been nearly exclusively focused within more widely studied areas of the American Southwest (e.g., southern Arizona). In light of this regional gap, this study focuses on an experimental approach to better understanding use-wear patterns on ground stone within the Virgin Branch Puebloan region. Building upon past experimental studies involving ground stone technology, this study specifically focuses on understanding use-wear patterns on vesicular basalt from the Shivwits Plateau of northwestern Arizona. Through controlled time intervals on experimentally constructed manos and metates, the results of this study present use-wear patterns on vesicular basalt manos and metates used to process a variety of organic materials. Ultimately, the conclusions of this study shed light on use-wear patterns on experimentally constructed manos and metates for the purpose of more accurately interpreting the archaeological record, within and beyond the Virgin Branch Puebloan region, on a medium (i.e., vesicular basalt) previous experimental studies have not presented.

**Gorczyk, John (Cornell University)**

**[129]**

*Caprines in the Cattle Zone: Reconciling Faunal Data at Two Scales during the Early Neolithic in the Sofia Basin, Bulgaria*

Animal husbandry was a major adaptive mechanism facilitating the spread of farming communities throughout southeastern Europe. Recent big-data syntheses have contributed greatly to our understanding of the environmental and social processes of neolithization in the region. While faunal reports often form an integral component of these studies, issues of data standardization and analytical choices understandably prevent achieving the resolution needed to investigate human behavior and decision making at the site level. This can lead to a mischaracterization of human-animal relationships at the smaller scale on which they are enacted. The early Neolithic (ca. 6100–5800 BCE) site of Slatina in Bulgaria's Sofia Basin provides a useful example. From a regional perspective, Slatina appears to be in the more temperate zone of increased reliance on cattle husbandry. The zooarchaeological and isotopic data presented here offer a zoomed-in look at herding, landscape use, and consumptive practices based on a mixed management strategy primarily focused on caprines. This study highlights the potential of faunal data to weigh in on prehistoric phenomena at multiple scales while stressing the central role zooarchaeology should play at the interpretive level by providing useful proxies on human behavior at the smaller scale of a site and its environs.



**Gordon, Falicia (University of Alabama), Eric Sipes (Alabama Historical Commission) and Linda Derry (Alabama Historical Commission)**

**[187]**

*Public Outreach and CRM: A Successful Partnership at Old Cahawba Archaeological Park in Dallas County, Alabama*

Over the summers of 2016 and 2017, two divisions within the University of Alabama Museums Department helped create successful outreach programs in Dallas County, Alabama, with the support of some strategic partners, namely the Alabama Historical Commission, among others. The Office of Archaeological Research was contracted by the Alabama Historical Commission to conduct a multifocal archaeological program due in part to the focus on the 200th anniversary celebration of statehood at Old Cahawba Archaeological Park. Multiple geophysical surveys were conducted to find the footprint of Alabama First State House, which was commissioned to be constructed by Alabama's first governor, William Wyatt Bibb, in 1819. This geophysical project led to excavations of the footprint of the state house by the Office of Archaeological Research in 2016 and the Alabama Museum of Natural History Expedition in 2017. Public archaeology was incorporated into the research designs resulting in Public Archaeology and Artifacts Days, which included lectures and hands-on learning. Portions of the summer projects were also filmed by the Emmy-award winning crew of *Discovering Alabama* for an episode on Alabama's state capitals.

**Gore, Angela (Center for the Study of the First Americans, Texas A&M University)**

**[34]**

*Geochemical Characterization and Raw Material Procurement at McDonald Creek, Alaska*

Around 14,000 years ago, modern humans dispersed into eastern Beringia. McDonald Creek, located in the Tanana Valley, central Alaska, is a significant part of characterizing this dispersal as one of the earliest known sites in eastern Beringia. This site possesses three cultural occupations dating to 13,800, 12,700, and 5,000 kcal BP, respectively. McDonald Creek's lithic record is significant in understanding how the earliest Beringians established themselves on subarctic landscapes and how subsequent hunter-gatherers in central Alaska adapted to dynamic Late Pleistocene and Holocene environmental regimes. Portable X-ray fluorescence (pXRF) studies are useful for exploring human behavior reflected in lithic technologies, including toolstone provisioning patterns, mobile strategies, and landscape use. This presentation reports results of pXRF analyses of non-obsidian fine-grained volcanics (e.g., rhyolites, dacites, basalts, and andesites) present in the McDonald Creek lithic assemblages, building on a small but growing number of Beringian geochemical sourcing studies. Results of this study provide valuable insight into the adaptive strategies of prehistoric Alaskans that repeatedly occupied the Tanana Valley from the Allerød interstadial through the middle Holocene.

Gorenflo, L. G. [104] see Nichols, Deborah

Goring, Daniel [31] see Chen, Caleb

Goring, Daniel [31] see Zhang, Peiqi

**Gorman, Alicia (UC Santa Barbara) and Christian Cancho Ruiz (University of Virginia)**

**[128]**

*(Re)constructing the Social Structure of Society at Cerro Tortolita through Its Ceramic Assemblage*

In this study I use the ceramic assemblage at Cerro Tortolita as a means of addressing issues related to social differentiation. Cerro Tortolita is an Early Intermediate period site occupied from about AD 250–450 in the Upper Ica Valley on the south coast of Peru. It includes a large ceremonial component as well as a sizeable residential area, and its Early Nasca style ceramics suggest that it was a participant in a pilgrimage and ceremonial network based at the neighboring site of Cahuachi in the Nasca Valley. In a previous study of the ceramic assemblage from the Ceremonial Zone of Cerro Tortolita I found evidence of feasting in restricted-access ceremonial contexts as well as in a large public plaza. Recent excavations in the Primary Residential Zone of the site now permit a comparison of assemblages between the two zones to further study the social structure at the site. Ceramics provide an important line of evidence in determining whether religious authority was (1) restricted to the Ceremonial Zone and (2) correlated with other types of power, such as political or economic. Through focusing on commoner contexts this study includes them as actors in the construction of their own societies.

**[128]**

*Chair*

Gorman, Alicia [128] see Cancho Ruiz, Christian

Gough, Stan [5] see Furlong, Julia

**Gover, Carlton (University of Colorado, Boulder; Pawnee Nation of Oklahoma), Douglas Bamforth (University of Colorado, Boulder) and Kristen Carlson (Augustana University, Sioux Falls)**

**[96]**

*Bayesian Analysis of the Chronology of the Lynch Site (25BD1) and Comparisons to the Central Plains Tradition and Central Plains Oneota*

This paper uses a Bayesian approach to existing and new radiocarbon dates to examine the chronology of three distinct thirteenth-through fifteenth-century occupations on the Central Plains. First, we present new dates from the Lynch Site (25BD1) on Ponca Creek in northeastern Nebraska and examine them in relation to dates on related sites along Ponca Creek. Second, we compare the Lynch site/Ponca Creek chronology to the chronology of the Central Plains Tradition (CPT) and Central Plains Oneota sites in

Nebraska and Kansas. Chronology is archaeology's backbone: unless we control time accurately and precisely, we cannot see patterns of change or relationships in space. Controlling chronology is never an end in itself, but it is always an essential means to all of the ends that matter for our field. Plains archaeology is keenly aware of this: debates over temporal sequences and revisions of those sequences as new evidence and better analytic tools have long been critical to improving our ability to see the past. Our focus here is narrow, but it has important implications for major issues of migration, social interaction, ethnogenesis, and other topics.

**Graf, Kelly, Julie Esdale (Colorado State University - CEMML), Ted Goebel (Texas A&M University - CSFA), Nathan Shelley (Texas A&M University - CSFA) and Thomas Urban (Cornell University)**

**[34]**

*Stratigraphy and Radiocarbon Chronology at McDonald Creek: A Multicomponent Pleistocene-Holocene Site in Central Alaska*  
McDonald Creek, located in the Tanana Flats ~55 km south of Fairbanks, Alaska, rests on an isolated remnant of an ancient alluvial terrace of the Tanana River that hugs the southeast corner of a monadnock rising from the flats. While testing the site, we discovered a well-preserved set of occupation layers dating from nearly 14–5 ka. In every place tested, we found the lowermost occupation layer in addition to at least one or more overlying layers, and each square produced up to 2,500 artifacts, hundreds of bones, and charcoal. Fortunately, one test square centered over two charcoal-rich features dating to ~13.8 ka and ~12.7 ka, respectively. In 2017, we opened a 25 m<sup>2</sup> excavation block encompassing this very productive test area. Since then we have completed 18 m<sup>2</sup> and would have completed the entire block in 2020, but the COVID-19 pandemic interrupted our fieldwork. Currently we have >50,000 3D-plotted cultural materials from excavation, including lithic and osseous artifacts, faunal remains, paleobotanical remains, hearth features, a possible dwelling, trash pits, and lithic reduction areas. This poster will present an overview of materials, but primarily it will present site stratigraphy and radiocarbon dating to inform on chronology and site formation.

**[34]**

*Chair*

Graf, Kelly [34] see DiPietro, Lyndsay

Graf, Kelly [34] see Esdale, Julie

Graf, Kelly [34] see Forget Brisson, Laurence

Graf, Kelly [34] see Henry, Aureade

Graf, Kelly [34] see Shelley, Nathan

Graham, Elizabeth [72] see Praet, Estelle

Gralia, Maiya [53] see Palonka, Radoslaw

Gralia, Ross [53] see Palonka, Radoslaw

**Grant, Leah (San Jose State University)**

**[54]**

*Deep Creek Site (CA-SBR-176): Rehabilitating Legacy Collections with the Veterans Curation Program*

The Deep Creek Investigation is a small legacy collection of artifacts and documents from the Deep Creek Site (CA-SBR-176), which is located in the Mojave River Forks region in San Bernardino County, CA, within the US Army Corps of Engineers (USACE), Los Angeles District. This collection was recently rehabilitated by technicians at the Veterans Curation Program (VCP) laboratory in San Mateo. The VCP is funded by the USACE and provides temporary employment to newly separated veterans. The veteran technicians gain transferable job skills via the process of rehabilitating USACE-owned archaeological collections. In turn, the research value of collections like Deep Creek is ensured for the future as these collections are rehabilitated for long-term storage. The rehabilitation of these collections at the VCP brings them one step closer to being accessible to communities and researchers. This paper describes the rehabilitation process of the Deep Creek Site collection at the VCP, connects new data to previous findings, and examines the collection's potential to answer new research questions in the future.

Grant, Leah [8] see Giffin, Sarah

Gratuze, Bernard [77] see Sánchez de la Torre, Marta

**Grauer, Kacey (Northwestern University)**

**[123]**

*Politicizing Post-Humanism: Elite and Commoner Household Excavations at the Ancient Maya City of Aventura, Belize*

Post-humanism importantly considers active roles of nonhuman entities in society. However, it is crucial that power relationships between people do not fall by the wayside when studying past societies. In this paper, I approach geological features at the ancient Maya city of Aventura, Belize, from a perspective that intertwines post-humanism and political ecology. "Pocket *bajos*" are geological features that provided important resources to the people living at Aventura, and their roles in activities such as ancestor veneration suggests they were active members in community building. Additionally, they cut across hierarchical lines of power within the city. Even though there was inequality at Aventura, it was not structured by access to pocket *bajo* resources. This paper

presents excavation data from recent research at Aventura and juxtaposes two households—one elite and one commoner—on the edges of pocket *bajos*. I argue that although the landscape was indeed an active part of ancient Maya society, power relationships between humans is what (re)produced inequalities between humans at Aventura.

[123]

Chair

Grave, Peter [150] see Bhattacharyya, Tiya

Gravel-Miguel, Claudine [28] see Brun, Catherine

Gravel-Miguel, Claudine [40] see Keller, Hannah

Gravel-Miguel, Claudine [195] see Padilla-Iglesias, Cecilia

Graves, Michael [194] see Peck, Katherine

### Gray, Michelle and Meredith Hardy

[146]

*African and Afro-Caribbean Cultural Identity, Vessel Function, and Inter-island Connectedness in Eighteenth- to Nineteenth-Century St. Croix, US Virgin Islands*

As part of the Slave Wrecks Project, excavations at Christiansted National Historic Site on St. Croix, US Virgin Islands, have resulted in the collection of thousands of artifacts associated with the Danish West India and Guinea Warehouse Complex. Within this assemblage, hundreds of sherds of Afro-Caribbean colonoware, or Afro-Cruzan ware, have been identified. Former analysis of the colonoware established a typology as well as suggested local manufacture. In this presentation I discuss the methods used to reevaluate the typology and function of Afro-Cruzan wares as a product and symbol of the Transatlantic Slave Trade. This study includes provenance analysis to determine whether or not these wares were produced locally on St. Croix or elsewhere to identify potential spheres of interaction, and if the same sources of material were used in prehistoric times. Additionally, insight into potential influence these wares had on the evolution of African and Afro-Caribbean foodways will be presented. It is proposed that Afro-Cruzan ware represents cultural and economic perseverance, despite colonial oppressive conditions. Thus, this research highlights enslaved and free Africans' lives as they sought to maintain autonomy through daily tasks expressed through ceramic traditions.

Green, Adam [123] see Bates, Jennifer

Green, Amie [167] see Trusler, Kate

### Green, Jennifer (University of Tennessee) and Anneke Janzen (University of Tennessee)

[96]

*Collagen Peptide Fingerprinting (ZooMS) of Archaeological Worked Bone from Southern Florida*

Archaeological investigations have demonstrated extensive connections among hunter-gatherer populations across the vast southern Florida landscape facilitated by a complex aquatic ecosystem. The prehistoric inhabitants expressed regionally specific differences in material culture, including and bone artisanship, but engaged in nearly identical subsistence practices related to animal use. While some burial practices from the Late Archaic to Belle Glade (Woodland/Mississippian) periods indicate differences in the types of animals interred with humans, little is understood in terms of how animals were integrated into human ideology and social identity. Species used to manufacture bone ornaments offers one window into the ideological/symbolic roles of animals, but has remained largely unstudied, primarily because the degree to which bones have been modified into desired objects erases identifying features unique to species. Our paper presents new results using collagen peptide fingerprinting, or Zooarchaeology by Mass Spectrometry (ZooMS), to identify morphologically ambiguous worked bone artifacts, which clarifies the importance of different animal species with respect to ideological beliefs held by native inhabitants to south Florida. We argue that the animals used for bone artifact manufacture may have held special meanings for the different groups that made and used them.

### Green, Olivia (Texas State University), Ashley McKeown (Texas State University) and Nicholas Herrmann (Texas State University)

[32]

*Comparing Patterns of Skeletal Pathology in Enslaved Africans from an Eighteenth-Century Cemetery on St. Eustatius*

This research investigates the patterns of skeletal pathology of 15 enslaved individuals in an eighteenth-century cemetery on St. Eustatius. Nine different pathology markers were analyzed from the 15 individuals of St. Eustatius and compared to individuals from the Newton Plantation Cemetery on Barbados and the New York African Burial Ground (NYABG) to see if the trade-based economy of St. Eustatius affected slave health and quality of life. Frequencies of each marker were calculated. Schmorl's nodes and vertebral osteophytes were most frequent in the St. Eustatius individuals. In addition, rates of enthesopathy and periostitis were significantly lower on St. Eustatius than compared with the other sites. The remaining pathological markers had relatively comparable frequencies. Despite comparable frequencies, the degree of each marker measured at the Newton Plantation Cemetery and the NYABG were more severe as compared to the St. Eustatius sample. This difference in severity of pathological conditions indicates the island's trade-based economy may have affected the enslaved population by reducing physical strain on their bodies in comparison to similar enslaved populations. This comparative study is important in adjusting biased historical accounts of slavery on

St. Eustatius and provides a perspective on the range of physical stresses associated with slavery.

Green Mink, Kirsten [67] see Izzo, Victoria

Greenlee, Diana [97] see DiNapoli, Robert  
Greenlee, Diana [77] see Sherman, Simon

**Greenwald, Alexandra (University of Utah)**

**[175]**

*Women's Time Allocation Trade-Offs in an Intensive Foraging Economy Led to Future Discounting Reproductive Behavior*

Population growth during the Medieval Climatic Anomaly (MCA) (1100–600 BP) and into the Late period (~600–180 BP) in Central California drove increased intensification and reliance on low-ranking, low-risk food sources, primarily acorn and small seeds inland, and shellfish and small schooling fish on the bay shore. These foods rely disproportionately on the labor input of women to gather and process. This focus on foods reliant on intensive female labor, combined with well-documented declines in reproductive-aged women's foraging efficiency associated with the care of breastfeeding offspring, created high foraging opportunity costs for women. This time-allocation trade-off between foraging and direct parental investment may have incentivized earlier weaning ages during the Late period. A high risk of shortfall led to future-discounting reproductive behavior such that, in an effort provide sufficient foraging returns at the household level, women inadvertently decreased their inter-birth intervals and increased their fertility, producing greater strain on the household economy. Therefore, although high extrinsic mortality conditions associated with the MCA abated around 600 BP, the shift in life history strategies to a risk-averse quantity over quality approach during the MCA precipitated a cycle of population growth and intensification that extended into the Late period, driven by women's time-allocation trade-offs.

**Greer, John (Greer Archeology) and Mavis Greer (Greer Archeology)**

**[53]**

*Horses in East-Central Montana Rock Art: A Test for Crow, Blackfoot, or Other Ethnic Affiliation*

Keyser's interest in horse styles in rock art of the Northwestern Plains has expanded our knowledge and ways of thinking about this image. His recent work to quantify differences in Crow and Blackfoot horses has led to identifying infusions of each group into the other's territory. However, his identification system has not been used to inform us about the rock art of the refuge area of east-central Montana extensively used by many tribes in the 1800s. We examine horses at several sites in this area centered along the Musselshell River to determine if Keyser's system can identify them as Crow or Blackfoot, and if there are other styles that can be attributed to one of the many other tribes ethnographically known to have used the area during that era.

Greer, John [153] see Greer, Mavis

**Greer, Mavis (Greer Archeology), John Greer (Greer Archeology) and Gene Munson (GCM Services Inc.)**

**[153]**

*Dr. Lynn Fredlund, Archaeologist of the Northwestern Plains*

Lynn Fredlund was a product of the 1960s, the decade before women exploded onto the archaeological scene on the Northern Plains. She was one of the earliest archaeologists to earn her living as a contract archaeologist and one of the first in the region to earn a PhD while actively pursuing a career that involved intensive fieldwork followed by intensive, time-sensitive report writing. Her work on large-scale survey projects in Montana brought her to the forefront of lithic studies, and her work with rock art recording and analysis was ahead of the boom in these studies that began in the 1990s. Records of the region, mostly available in reports and site forms, reflect her career of data accumulation on Plains cultures, but she also reached the public and peers with publications. She was an ordinary archaeologist who gathered an extraordinary amount of information on Plains archaeology.

Greer, Mavis [53] see Greer, John

Greer, Sean [44] see Bullion, Elissa

**Gregorio de Souza, Jonas (Universitat Pompeu Fabra)**

**[195]**

*Archaeological Expansions in Tropical South America during the Late Holocene: Assessing the Role of Demic Diffusion*

Human expansions motivated by the spread of farming are one of the most important processes that shaped cultural geographies during the Holocene. The best known example of this phenomenon is the Neolithic expansion in Europe, but parallels in other parts of the globe have recently come into focus. Here, we examine the expansion of four archaeological cultures of widespread distribution in lowland South America, most of which originated in or around the Amazon basin and spread during the late Holocene with the practice of tropical forest agriculture. We analyze spatial gradients in radiocarbon dates of each culture through space-time regressions, allowing us to establish the most likely geographical origin, time, and speed of expansion. To further assess the feasibility of demic diffusion as the process behind the archaeological expansions in question, we employ agent-based simulations with demographic parameters derived from the ethnography of tropical forest farmers. We find that, while some expansions can be realistically modeled as demographic processes, others are not easily explainable in the same manner, which is possibly due to different processes driving their dispersal (e.g., cultural diffusion) or problematic/incomplete archaeological data.

Gregory, Michael [184] see Peterson, Jane

Griffith, Timothy [96] see Lassen, Robert  
Griffith, Timothy [25] see Seikel, Katherine

Griffiths, Michael [150] see White, Joyce

**Griffiths, Seren (Manchester Metropolitan University), Ben Edwards (Manchester Metropolitan University), Tom Higham (University of Oxford) and Julian Thomas (Manchester University)**

[97]

*Events, Narrative, and Data: Why New Chronologies, Big Data, and New Materiality Should Change How We Write Archaeology*  
Archaeology, at its broadest, constitutes a specific set of practices utilizing material culture to create meaningful narratives. Central to this is our discipline's relationships with time. This paper will discuss the "time dimensions" and ways archaeological narratives are structured. We suggest that archaeologists need to readdress our approaches to time given recent developments in archaeological research. Times have changed.

**Grimes, Vaughan (Memorial University), Madison Janes (Memorial University), Andrew Kenney (Memorial University), Colleen Zori (Baylor University) and Davide Zori (Baylor University)**

[70]

*Multi-isotope Evidence for Animal Husbandry, Transhumance, and Human Diet at San Giuliano, Italy*  
The San Giuliano Archaeological Research Project (SGARP) offers an excellent opportunity to investigate potential diachronic changes in human-animal interactions from the Etruscan to Late Medieval periods in central Italy. Here, we report on faunal and human multi-isotope data ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ , and  $^{87}\text{Sr}/^{86}\text{Sr}$ ) from the medieval acropolis on the San Giuliano plateau, as well as the development of a local strontium "isoscape" using modern plants from the San Giuliano plateau region. Combining these data with existing predictive baseline isotope models for Italy, we explore issues of animal transhumance, human land use, and subsistence patterns at San Giuliano. These results will be discussed in context with other archaeological evidence from the SGARP to better understand the human-animal experience at this site.

Griswold, William [38] see Humphreys, Stephen

Grosjean, Sergio [158] see Martos, Luis

Grossman, Hanna [195] see Farahani, Alan

Gruber, Anya [29] see Heidkamp, Blair

Gruber, Janna [187] see Beach, Sonya

Gruber, Thomas [187] see Beach, Sonya

**Grund, Denay (University of Nevada, Reno), D. Craig Young (Far Western Anthropological Research Group) and Douglas Boyle (University of Nevada, Reno)**

[6]

*Developing a Geomorphic and Archaeological History of Painters Flat*  
Painters Flat is a small basin along the California/Nevada border and has never been described in literature. This past summer, the Far Western Anthropological Research Group recorded numerous sites spanning the entire chronological sequence for the region. Along with archaeological data, I collected information on landforms, profiles, and outcrops to reconstruct the basin's hydrographic history. I correlate archaeological site distribution to the basin's hydrologic history to determine how climatic changes from the Terminal Pleistocene/Early Holocene to the Middle Holocene affected settlement-subsistence strategies. I also compare my results to nearby larger lake systems to understand how these smaller hydraulic systems—and the humans living in them—responded differently to climate change.

**Gruntorad, Kelsey (Northern Arizona University) and Chrissina Burke (Northern Arizona University)**

[13]

*Re-creating and Rethinking Pot Polish: The Taphonomic Implications of Cooking Fauna*  
Archaeologically, the term "pot polish" refers to wear on skeletal elements resulting from cooking in a ceramic vessel. The active mixing, stirring, and rubbing of the materials within and against the vessel's abrasive interior leads to polished fragmented bones. Unfortunately, limited experiments have been conducted on this topic. Despite natural taphonomic processes producing similar

polishing modifications, archaeologists confusingly use cultural and natural attributes interchangeably. Given this lack of knowledge, investigations challenged if pot polish is in fact created in the manner described. Using experimental archaeology, this research tests whether cooking skeletal remains does in fact result in polishing. This research further demonstrates the extent to which pot polish is human produced and identifiable macroscopically. Not only do the outcomes of these experiments contribute to future studies exploring taphonomy, but this project presents an opportunity to discuss shifting traditionally assumed archaeological narratives through zooarchaeological and experimental methods.

Gruntorad, Kelsey [26] see Benning, Maxwell

**Guðmundsdóttir, Lísabet (University of Iceland)**

**[148]**

*Driftwood, a Lifeline in the Arctic: Production of Artifacts from Driftwood in Northwest Iceland and Norse Greenland*

Iceland was settled by the Norse in the late ninth century and Greenland was settled from Iceland around AD 1000. Although these countries are quite dissimilar in landscape and geology, they have a similar flora in which the only forest-forming tree is birch. Birch alone could not sustain the wood demands of these Norse colonies for prolonged periods of time, but Icelanders and Greenlanders had another wood resource available to them—driftwood. This wood originates in the boreal forests of Russia/Siberia and North America, where trees fall from eroding riverbanks into rivers that carry the driftwood into the Arctic Ocean. In Iceland, one of the most driftwood-rich areas is Strandir in the northwestern fjords. Here, in the recent past, there was a strong woodworking tradition with a level of craft specialization that produced highly sought-after artifacts, furniture, and boats. Not as much is known about the woodworking tradition in Norse Greenland, but recent archaeological research on wooden objects suggests that here, too, driftwood was a very important resource exploited by skilled craftspeople. In this presentation I will discuss literary sources about wood utilization in Strandir and how they can be compared to the archaeological material from Norse Greenland.

Guebard, Matthew [97] see Kessler, Nicholas

**Guernsey, Julia (University of Texas, Austin)**

**[107]**

*Discussant*

Guerra, Rafael [23] see Roa, Ian

Guerra, Rafael [152] see Walden, John

Guevara, Evelyn [182] see Nelson, Elizabeth

**Gunn, Joel (University of North Carolina, Greensboro)**

**[138]**

*Discussant*

**Gunter Bassett, Madeleine (William & Mary)**

**[185]**

*Discussant*

**Gush, Matthew (Photographer)**

**[8]**

*Visual Storytelling for a Modern Age*

Visual Storytelling for a Modern Age: In a visually obsessed world, many archaeologists have squandered the potential for effectively sharing the story of their research. This presentation focuses on the importance of integrating a content creator and utilizing modern image creation techniques to more effectively communicate the story of archaeology, while freeing the archaeologist to focus on their work. By utilizing cutting edge technologies, such as drone imaging, and social media, such as Instagram, there are immense opportunities to create content in an engaging fashion, and share it with a limitless online audience. This engagement helps build understanding, excitement, and awareness with the public, solidify community support, and assists with prospective funding opportunities.

**Gusick, Amy (Natural History Museum of Los Angeles)**

**[98]**

*Chair*

Gusick, Amy [83] see Napolitano, Matthew

**Gutierrez, Maria (CONICET, INCUAPA), Nahuel Scheifler (INCUAPA-CONICET), Cristian Kaufmann (INCUAPA-CONICET), Daniel Rafuse (INCUAPA-CONICET) and Agustina Massigoge (INCUAPA-CONICET)**

**[28]**

*Bone Modification Pattern Produced by the South American Carnivore Lesser Grison (Galictis cuja)*

This study is part of an actualistic taphonomic project designed to characterize the bone modification patterns generated by native South American carnivores. We present the results of the bone modifications (skeletal representation, breakage, and tooth marks) produced by a captive lesser grison (Mustelidae: *Galictis cuja*) that was fed 10 wild guinea pigs (*Cavia aperea*) at a local zoo. Here, we present the results of the non-ingested bones. This assemblage corresponds to 560 specimens; 64.6% are identifiable elements and 35.4% are undetermined bone fragments. A high percentage of the remains (77%) are fractured, and 42% showed some type of carnivore mark, including pits (25.4%), crenulated edges (21.1%), punctures (9.3%), scores (8.9%), and notches (1.8%). The more frequent elements are cranium, teeth, and autopodial bones. Results suggest that the lesser grison produces a highly modified bone assemblage. The information contributes to understanding the bone modifications produced by this small-sized carnivore and provides a frame of reference for a more comprehensive understanding of the accumulations produced by small-sized predators in the South American archaeological record.

**Guzman Piedrasanta, Melvin Rodrigo (University of Central Florida)**

**[56]**

*Discussant*

**Haas, Jennifer (University of Wisconsin-Milwaukee)**

**[114]**

*Woodland Tradition Plant Use and Foodways in the Western Great Lakes: A View from Southeastern Wisconsin*

This paper implements a multiproxy approach to Woodland foodways, integrating plant macrobotanical studies, faunal analyses, ceramic morphological and use-wear analyses, and absorbed residue analyses. Datasets from southeastern Wisconsin and the surrounding region highlight diachronic trends of wild resource procurement, processing, and consumption. In southeastern Wisconsin, foodway data suggest that Early and Middle Woodland populations were seasonally mobile foragers reliant on a variety of wild plants and animals with limited use of domestic cultigens. Late Woodland contexts have yielded evidence of domestic and tropical cultigens, as well as nuts and wild seeds. Recent analysis of Finch site (47JE0902) data has yielded a wealth of information regarding Woodland Tradition foodways owing to the recovery of well-preserved plant macrobotanical and animal remains, as well as associated ceramics. The foodway data from the Finch site demonstrate a shift in foodways from the Early to Middle Woodland period involving an intensification of hickory nut harvesting, an increased emphasis on gardening, and development of innovative food processing technologies. Maize does not appear to be present prior to the late tenth century but becomes ubiquitous in Late Woodland times.

**Habicht-Mauche, Judith (UC-Santa Cruz)**

**[125]**

*Discussant*

**Hackenberger, Steven (Central Washington University), Tom Marceau (Independent), John Davis (Independent) and David Babchanik (Central Washington University)**

**[39]**

*Radiocarbon Datasets, Population Proxies, and Climate Proxies: The Hanford Reach and the Yakima Fold Belt, Columbia Plateau*

A review of progress in radiocarbon dating for riverine and upland sites identifies data gaps and issues that are relevant for understanding archaeological landscapes. A total of 183 radiocarbon dates have been obtained from the Hanford Reach and adjacent lands; 108 of these date cultural materials. Occupations appear to grow steadily; however, after 1700 BP use of the Reach may have declined compared to other areas of the plateau. Radiocarbon dates for the Yakima Upland define occupation phases and several cycles of stream cutting and filling. Fifty-six dates were associated with cultural features. The one significant gap in dates from landforms is between 2000 and 3000 BP. No cultural dates have been obtained from 6670–8090 cal BP. The dataset suggests a shift to upland use by 2000 BP. It is obvious that more and better radiocarbon dating for sites is necessary to address basic questions about the effects of air-fall and redeposited tephra, slope stability and soil formation, stream habitats and shellfish use, introduction of formal ground-stone tools, root processing, and equilibrium in small and large mammal hunting.

**[39]**

*Chair*

Hackenberger, Steven [39] see Brown, James

**Hadden, Carla (Center for Applied Isotope Studies, UGA) and Margo Schwadron (National Park Service)**

**[130]**

*Shell Works of the Ten Thousand Islands, Florida: A Preliminary Settlement Model*

The Ten Thousand Islands region of the southwest Florida coast contains extensive prehistoric shell-matrix sites, ranging from small, single rings to large, complex, multi-mound "Shell Works" sites, composed of oyster shell predominantly. Few have ventured to explore this unique archaeological landscape due to the extreme remoteness of the region. In recent years, a reconnaissance program aimed at documenting and describing the region's shell works sites yielded a database of hundreds of radiocarbon dates. However, questions regarding the timing and tempo of shell work construction remain poorly resolved due to limitations of the radiocarbon dataset: (1) it is skewed in favor of near-surface deposits, with very few dates from basal or sub-mound contexts; and

(2) most dates are on oyster shell, which inherently limits the dating precision due to complexities of the estuarine radiocarbon reservoir. Here, we employ a regionally specific  $\delta R$  value to interpret the dataset within a Bayesian chronological framework to explore the temporality and distribution of shell work sites. We identify patterns in the evolution of shell work forms over time, posit a preliminary settlement model for the region, and identify directions for future research aimed at building a more fine-grained and robust regional settlement model.

**Hadley, Alison (Texas A&M International University)**

**[105]**

*Shifting Contexts on the Economy of Pipestone*

Red pipestone artifacts often inspire archaeological investigations of craft production at the site level. Reconstructions of pipestone in the past center on the object itself as central to ritual paraphernalia. However, a regional perspective of pipestone's role in the economies of indigenous and colonial communities is underexplored. This research takes previously recorded geological provenance studies with evidence of manufacture to hypothesize about the changing economic role of pipestone across the midcontinent. Data collected from over 1,000 pipestone artifacts and pipestone powder samples at seven curatorial facilities is applied in this study. Included in the data are mineralogical signatures collected from a nondestructive scan of an infrared reflectance spectrometer (ASD Terraspec) and qualitative documentation of manufacture processes. For the spatiotemporality of pipestone economy, artifacts from six midcontinental states dating from AD 1 to 1750 are included. This research attempts to situate the interpretation of pipestone within shifting contexts, from a ritual economy to a commodified good.

**Haines, Julia (University of Virginia)**

**[185]**

*Discussant*

Hakongak Gross, Pamela [179] see Friesen, Max

**Halcrow, Sian (University of Otago, New Zealand)**

**[190]**

*Discussant*

Halcrow, Sian [29] see Miller, Melanie

**Halford, F. Kirk (BLM, Idaho Deputy Preservation Officer/State Archaeologist)**

**[49]**

*The National Cultural Resources Information Management System (NCRIMS): New Horizons for Cultural Resources Data Management and Analyses*

Though making great strides over the past 50 years, Section 106, the primary driver of cultural resource management (CRM), is still often boxed in by rote inventory and derivative interpretation and implementation. This paper will discuss a national initiative by the Bureau of Land Management (BLM) to create a national cultural resources data standard (NCRDS), which allows for the application of more rigorous data management principles that facilitate landscape level planning and data modeling on BLM administered lands across the western United States. The NCRDS and associated NCRIMS tool includes normalized data from 11 western SHPO and BLM data stores. NCRIMS allows for high-level planning during preparation of Programmatic Environmental Impact Statements, Resource Management Plans, and other multistate and regional project analyses—such as transmission, pipeline, and travel management undertakings. NCRIMS facilitates treatment of cultural heritage values early in the planning process versus late stages as has been traditional, as well as applying high-level modeling principles to early stage data analyses. This paper will discuss the BLM NCRDS, NCRIMS, and associated modeling tools, displaying ways we can break out of the box through standardized data management and applied analytical applications.

**Hall, Mark (Black Rock Field Office, Bureau of Land Management) and Tanner Whetstone (Black Rock Field Office, Bureau of Land Management)**

**[39]**

*Charcoal, Pollen, and Statistics: Spatio-Temporal Occupation of the Black Rock Desert Basin*

The Black Rock Desert Basin (HUC-6 160402) comprises the largest basin in northwest Nevada. Covering approximately three billion hectares, this basin contains the Quinn River drainage and the Black Rock and Smoke Creek playas. A radiocarbon database for the basin was assembled from the peer-reviewed and cultural resource management literature. Forty-nine sites have been excavated and yielded 237 radiocarbon dates. These dates are viewed as a demographic proxy. Palaeoclimate proxies from the study area include the Blue Lakes, Mud Meadows, and Summit Lake pollen cores, and the Jackson Mountain tree-ring widths. The radiocarbon record shows a low population density from 13 kBP through 5 kBP; growth decreases after the Mazama eruption, but slowly increases throughout the Middle Holocene. A pattern of population growth occurs from 5 to 1 kBP. During the Late Holocene Drought (ca. 2.5–1.9 kBP), sites south of 41° N are abandoned, while northward, there is an increase in occupation. The Late Antique Little Ice Age and the Medieval Climatic Anomaly are periods of population growth throughout the basin. The Little Ice Age is a period of cooler temperatures and increased moisture, the number of dated sites significantly decreases throughout the basin.

**[39]**

*Chair*



**Halligan, Jessi (Florida State University)****[98]***Where Is the Waterline? Integrating Terrestrial and Underwater Investigations in the Aucilla River, Florida*

Over the past decade, research in the Aucilla River of northwestern Florida has focused upon understanding the geoarchaeological context of numerous formerly terrestrial, now inundated sinkhole spring sites and the landscapes surrounding them. Dozens of terminal Pleistocene and early Holocene-aged diagnostic artifacts have been recovered from this river, some in association with drowned terrestrial soils and intact datable stratigraphy. Currently terrestrial sites of the same age have thus far proven undatable and are often conflated and deflated. The wealth of paleoenvironmental proxy data recovered from the drowned landscapes can help to explicate where, why, and how some sites have preserved while others have not and suggest how people were adjusting to their changing environments over the more than 14,000 years they have been occupying the Aucilla River basin.

**Halligan, Jessi (Florida State University)****[172]***Discussant***Halling, Christine (Louisiana Department of Justice) and Ryan Seidemann (Louisiana Department of Justice)****[20]***Unidentified Oddity of the Petrous Portion of the Temporal Bone: A Case Study from a Historic Cemetery in Louisiana*

While there are several commonly tracked non-metric and pathological features of the temporal bone, rarely are they found on the internal petrous portion. In this case study, the bilateral presentation of perforations located on the internal, superior aspect of the petrous portion of the temporal bone is discussed. The lesions are laterally placed near to the squama of the temporal bone rather than to the medial portion of the petrous. The perforations appear to manifest as wide porous lesions, each approximately 5mm x 15mm in size, superior to the auditory canal. Several conditions will be considered in completing the differential diagnosis including otitis media, cholesteatoma, brain herniation, and other osteolytic processes. There are no other obvious pathological conditions afflicting this individual. With an undetermined skeletal defect such as this, tremendous value is placed on the experience of other bioarchaeologists, and we welcome the opportunity for others to provide input and their own interpretation of the defect.

Halling, Christine [20] see Garcia-Putnam, Alex

Halling, Christine [67] see Seidemann, Ryan

**Hambrecht, George (University of Maryland, College Park), Nicole Misarti (University of Alaska, Fairbanks), Arni Daniel Juliosson (Stefansson Arctic Institute, University of Akureyri) and Francis Feeley (Graduate Center of the City University of New York)****[179]***Marine Fish Zooarchaeological Data from Iceland and the Central North Atlantic Marine Historical Ecology Project*

This paper will discuss a new NSF-funded project, the Central North Atlantic Marine Historical Ecology Project (CAMHEP), as well as provide an overview of the current overall state of marine fish zooarchaeological data from Iceland. CAMHEP will utilize marine zooarchaeological data from Icelandic archaeological sites dating from the first settlement of Iceland in the second half of the ninth century CE through the nineteenth century. It will attempt to build a record of the complex relationships between changing marine and climate conditions, human fishing, and cod populations over the last millennium. CAMHEP will combine archaeological, historical, and biochemical analytical methods to build a new and deeper record of the relationship between cod and humans in Iceland that will serve as an important tool in managing this relationship in the present and future. This presentation is a product of the North Atlantic Biocultural Organization (NABO) and it is part of an ongoing collaboration with the Paleoecology of Subarctic Seas (PESAS) research group.

**Hamilton, Derek (Scottish Universities Environmental Research Centre)****[130]***Is La Tène (Still) Relevant in British Iron Age Chronology?*

La Tène: a chronology that lives beyond the site, beyond regional and national boundaries; a term that conjures images of swirling ambiguous imagery, fine metalwork and shining pots. In Britain the term describes artifacts of apparently comparative date, in particular brooches. La Tène I brooches have strong affinities with examples from the type site and on the near continent, while La Tène II brooches are often exceedingly different from their apparently contemporary counterparts in France, Belgium, Germany, and Switzerland. The proposed stylistic connections between regions have been used to create the chronology of these artifacts in Britain, organized into periods, bracketed by calendar years. In turn these stylistically dated brooches have been used as evidence to date features and sites. This paper uses radiocarbon dates obtained from human and animal remains found within close association to brooches to create an independent chronology that transcends geographical, temporal, and culture-historical boundaries, and can be compared back to the data from Continental Europe. It will also discuss the implications of research on existing chronological sequences and examine the issues of using La Tène typologies as the basis for constructing Bayesian models.

Hamilton, Derek [130] see Rieth, Timothy

Hamilton, Marcus [65] see Kilby, David

**Hann, Don (Malheur National Forest)****[53]***Searching for Tobacco Man: Jim Keyser and the Ethnographic Analysis of Columbia Plateau Rock Art*

American Indian peoples of the Columbia Plateau have engaged with numerous scholars and others since the mid-nineteenth century to document many aspects of their traditional lifeways. The resulting documentary record has provided a gold mine for researchers studying the rock art of the region. Jim Keyser has been a leading practitioner and proponent of the use of ethnographic data to analyze Columbia Plateau rock art within its broader cultural setting. He has provided a fulcrum to bring a wide range of scholars, tribal members, students, and volunteers together in support of this goal. This paper provides an overview of the processes and results of this effort over the last 30 years.

**Hanna, Jonathan (Grenada National Museum), Matthew Napolitano (University of Oregon), Robert DiNapoli (University of Oregon), Jessica Stone (University of Oregon) and Scott Fitzpatrick (University of Oregon)**

**[130]***Modeling Demographic Change in the Precolumbian Caribbean**[WITHDRAWN]*

Hanscam, Emily [144] see Witcher, Robert

Hansen, Brooke [184] see Harrison, Laura

**Hansen, Nicolas (Arizona State University), John Murray (Arizona State University), Alexa Ferrer (Arizona State University), Hanah Edington (Arizona State University) and Kathryn Ranhorn (Arizona State University)**

**[40]***Variation in Response to Heat-Treatment in Jasper from the Perkinsville Valley, Arizona*

The heat treatment of lithic raw material is a globally dispersed technology that improves the flaking quality of toolstone. While not all types of stone respond to heat treatment, many forms of microcrystalline silicates do, including jasper. Here, we aim to better understand how Perkinsville jasper responds to heat treatment. Perkinsville jasper occurs in the Perkinsville Valley of Yavapai County, Arizona, and was utilized prehistorically by the Prescott, Sinagua, and Hohokam cultures. For our study, we collected seven boulders of jasper off of private land (with permission) in Yavapai County. These boulders were flintknapped into 74 spalls that were subsequently heated in an electric kiln using 20 treatment protocols with systematically varying combinations of maximum temperature and maximum heating times. Afterward, we compared multiple quantitative and qualitative characteristics of unheated and heated flakes taken from the same nodule pre- and post-heat treatment. Our heating protocol allows us to determine an “optimal heating context” for Perkinsville jasper and to better understand how variation in time and temperature influences flaking quality of the stone. Lastly, this research develops an experimental reference dataset that can be used by other researchers studying raw material use and heat treatment in the US Southwest.

**Hansen, Richard (University of Utah; FARES Foundation), Edgar Suyuc (Mirador Basin Project, Guatemala) and Gustavo Martinez (Universidad de San Carlos, Guatemala)**

**[48]***Middle Preclassic Occupation and Architecture of the Mirador Basin, Guatemala*

Archaeological excavations and technical analyses in the Mirador Basin of northern Guatemala have provided a new perspective of the origins and dynamics of incipient Maya civilization. Data relevant to settlement patterns, sampling strategies, demographic distributions, chronological evaluations, DNA and isotope analyses, geological studies, architectural formats, and formation of complex political, social, and economic structures. Incorporation of extensive lidar data combined with archaeological investigations on a regional basis suggest the formation of a complex state by the Middle Preclassic period with an apogee during the early Late Preclassic period. Tunnels in early structures have revealed new information about the nature of architectural construction and art dating to the latter Middle Preclassic period (ca. 600–400 BC). The architectural art and formats found on the buried structures indicate changes that occurred between the Middle and Late Preclassic periods of Maya history, including the style of architecture, variant architectural art and iconography, and construction techniques and strategies that vary from architecture from later Maya periods. The importance of such well-preserved architecture from such early time periods allows an evaluation of social and ideological process that set the foundations of Maya complex societies.

**[48]***Discussant***[48]***Chair*

Hansen, Richard [48] see Ensley, Ross

Hansen, Richard [48] see Thompson, Josephine

**Hanson, Annalys (Emory University, Atlanta), Jessica Thompson (Yale University), Jessica Cerezo-Román (University of Oklahoma), Jay Stock (University of Western Ontario) and Potiphar Kaliba (Malawi Department of Museums and Monuments, Lilongwe)**

**[40]***Mortuary Practices of Later Stone Age Hunter-Gatherers in Northern Malawi*

Later Stone Age (LSA) hunter-gatherer mortuary practices are poorly understood in south-central Africa. Tropical climate and acidic soils hinder preservation, bioturbation is prevalent, and research coverage is sparse. The site of Hora 1, in the Mzimba District of Malawi, provides a rare opportunity to examine diversity and continuity over time in mortuary practices. Two flexed adult burials of a male and female, recovered in 1950, were recently dated to ~9000 and ~8000 cal BP, respectively. A fragmentary adult skeleton, recovered in 2017–2018, represents an incomplete cremation dated to ~9500 cal BP. In 2019, two infant (neonate) skeletons were recovered below this incomplete cremation, and show further diversity in mortuary treatment. The first, a nearly complete flexed burial, was missing lower limb, hand, and foot elements that cannot be explained through taphonomic or postdepositional processes. Review of the original 1950 report shows that the flexed adult female was missing the same elements. The second infant burial also showed signs of postmortem manipulation, with partially articulated limbs recovered alongside the skull, rather than in anatomical position. Here we situate these five sets of remains within ethnographic and regional archaeological data and evaluate the possibility of mortuary curation practices during the LSA of northern Malawi.

**Hanson, Kelsey (University of Arizona), Steve Baumann (National Park Service), Todd Scissons (Pueblo of Acoma), Octavius Seowtewa (Pueblo of Zuni) and T. J. Ferguson (University of Arizona)**  
[109]

*Reinvigorating the National Register: Toward Multivocality in the Production of National Histories*

Most American archaeology is driven by the proverbial goal of listing properties on the National Register of Historic Places. As the comprehensive “list of the Nation’s historic places worthy of protection,” the National Register is a prestigious means of creating and memorializing our national history. After almost 55 years of implementation, archaeologists’ role in this process has become deeply routinized. The register and its attendant eligibility criteria are rightly critiqued for privileging the scientific value of archaeological sites over cultural, historical, and social values, which often disproportionately silences Native American voices. In this paper, we argue that archaeologists have an underappreciated means of circumventing these issues. One of the National Register’s most pervasive and fundamental concepts—the “historic context”—remains deeply undertheorized compared to more familiar terms like “significance” and “integrity.” As the frameworks through which all other evaluations of eligibility are evaluated, thoughtful production of multiple historic contexts can be used to capture multiple value systems. Using an example from the multivocal nomination of the Inscription Rock Archaeological District as a case study, we argue that historic context concept can be used to commemorate multivocality, moving from one National History to the production of multivocal national histories.

**Hantman, Jeffrey (University of Virginia)**  
[163]

*Discussant*

Haogak, David [179] see Lyons, Natasha

Hard, Robert [37] see Whisenhunt, Mary

Hardy, François [34] see Forget Brisson, Laurence

**Hardy, Meredith (National Park Service)**  
[146]

*Engaging the Present by Uncovering the Past: Community Archaeology and the Legacy of Enslavement, Resistance, and Emancipation, St. Croix, US Virgin Islands*

Since 2014, the National Park Service, as a partner in the Slave Wrecks Project, has conducted a community archaeology program as part of multiyear effort combining underwater and terrestrial archaeology with public engagement activities. Christiansted National Historic Site, and the Danish West India and Guinea Company Warehouse complex, St. Croix, US Virgin Islands, is unique in the National Park Service system in that the site was a nexus for the receiving, shipment, and incarceration and torture of Enslaved Africans from 1733 to 1803 for the Danish West Indies. Captured maroons were incarcerated at Fort Christiansvaern, tried in the colonial court, and punished or executed, making the fort a symbol of flight from bondage. Since 2017, the Society for Black Archaeologists joined SWP partners in conducting a community archaeology program at Estate Little Princess, also on St. Croix, which introduces students from local high schools and Historically Black Colleges and Universities (HBCUs) to the world of archaeology and coral reef restoration. This paper will highlight both of these programs’ efforts to identify archaeological resources pertaining to the lives of the enslaved and engage local youth in the world of heritage resource management.

[146]

*Chair*

Hardy, Meredith [146] see Gray, Michelle

**Hare, Timothy (Morehead State University)**  
[56]

*Discussant*

**Hare, Timothy (Morehead State University)****[189]***Connecting Ceremonial Groups across the Terminal Classic and Postclassic Constructed Landscapes in the Mayapán Region*

I present an analysis of the landscape connecting shifting ceremonial groups and settlement distributed across the Terminal Classic and Postclassic landscapes in the Mayapán region. Mayapán is the largest Postclassic urban center in the Maya Lowlands and has been the focus of previous research in the area. Traditional and lidar surveys at Mayapán reveal a broader landscape characterized by widely distributed ceremonial groups linking settlements across the region. The Terminal Classic landscape is densely occupied and dispersed. The Postclassic landscape is dominated by Mayapán's walled urban core, surrounded by a halo of ceremonial groups. This analysis examines regional settlement transformations through reconstruction of connections, such as pathways and gates in the constructed landscape in relation to the locations and forms of key public architectural features, walled houselots, cenotes, and the defensive wall. The settlement disjunction between the two periods suggests collapse followed by recovery.

**Harkness, Rebecca (University of Arizona)****[87]***Fired Fingerprints: A Point of Pines Pueblo Corrugated Ceramic Analysis*

Point of Pines Pueblo is a key site for understanding the Kayenta migration to the Mogollon and how communities adapt or maintain practices while experiencing changing demographics. This study analyzes practices in corrugated jar production before, during, and after the migration in the Point of Pines area. Exposed coils on corrugated jars allow us to identify practices used to create the vessels, which relate to inherited ways of jar production. The methods used by both Kayenta and Mogollon peoples for making corrugated jars, if differing, will have distinct signatures and attributes of ceramic production. This distinction should allow for the analysis of how ceramic production practices are affected by integration or, if these groups did not fully integrate, how ceramics can reflect the maintenance of preexisting community identities. For the pilot study, 90 corrugated jars from Point of Pines and nearby sites associated with periods before and after the migration are studied. Thirty vessels from each period are assessed for 19 attributes establish a baseline of standard practices for corrugated vessel production, and whether those practices changed over time. Changes in the attributes of the vessels will be used as a proxy for the effects of migration and cultural integration.

**Harle, Michaelyn (Tennessee Valley Authority), Laura Smith (University of Tennessee), Suzanne Fisher (Tennessee Valley Authority) and Heather Heart (Tennessee Valley Authority)****[153]***Florence Hawley's Enduring Legacy in Southeastern Archaeology and Beyond*

One of the pioneers of dendrochronology, Florence Hawley was employed by Tennessee Valley Authority (TVA) in the 1930s during the archaeological excavations that were conducted prior to impoundment of Norris Reservoir. Hawley's work was one of the earliest attempts at establishing a tree-ring chronology in the Southeast. While Hawley would go on to have an illustrious career in archaeology in the Southwest, unfortunately, sexist attitudes would undermine her efforts in the Southeast, and her early work was never published. It would be decades before the scientific community realized the importance of this research both within and beyond the archaeological discipline. This paper highlights Hawley's early research in the Southeast and describes how TVA is using her early research on red cedar samples to better understand the impacts of large droughts on TVA's operating system.

Harney, Éadaoin [55] see Owsley, Douglas

**Harris, Andrew (University of Toronto)****[150]***Theravada Buddhist Monastic Activity at Angkor: A Discussion of What, Where, and When*

The religious transition of the Khmer Empire (ca. 802–1431 CE) from Saivaite and/or Mahayana Buddhism to the religion known today as "Theravada Buddhism" is thought today to be one of the defining social phenomena of the late Angkorian period (ca. fourteenth to fifteenth centuries) in medieval Cambodia. However, despite the archaeological evidence of over 70 monastic substructures within the terminal Khmer capital of Angkor Thom, the absence of new temples and inscriptions have thrown any exploration of urban activity directly associated with "Theravada Buddhism" by the wayside. Called "Buddhist Terraces" in traditional scholarship and *prah vihar* by Cambodian archaeologists, investigations of these substructures across three field seasons at Angkor Thom from 2017 to 2019 have yielded incredibly valuable information concerning both specific ritual activities and their chronology at several sites, as well as structural augmentations over time. Furthermore, spatial data alongside diachronic analysis has revealed plenty concerning the importance of "place" in the construction of these monastic buildings, which provides clarity as to how localized religion both supplanted and incorporated previous traditions of temple-building from earlier religious eras at Angkor.

**Harris, Edward (Retired)****[164]***Discussant*

Harris, Jacob [173] see Coon, Sarah

Harris, Jacob [74] see Keevil, Trevor

Harris, Susan [21] see Fisher, Lynn

**Harrison, Laura (University of South Florida) and Brooke Hansen (University of South Florida)****[184]***Digital Approaches to Heritage at Risk and Sustainability at Egmont Key, Florida*

Most of the 200,000 tourists who visit Egmont Key, Florida, each year are unaware that the historically significant island is vanishing beneath their feet. In the last 150 years, the island has lost nearly 50% of its landmass due to climate change and anthropogenic activities. This presentation details an attempt to raise public awareness and understanding of sustainability and heritage at Egmont Key, with digital technologies and collaborative research. Geoinformatics methods, including terrestrial laser scanning and aerial photogrammetry, document the island's landscape and its surviving historic architecture, and a GIS analysis tracks the effects of coastal erosion and sand replenishment. Archival research and community outreach reveal previously unknown information about historical events, such as the incarceration of the Seminole people during the Indian Removal period. Other key heritages at risk include the Union occupation during the Civil War, militarization of the island during the Spanish American War, and yellow fever quarantine camps that included iconic people such as Clara Barton. Insights from these many datasets were combined to create an immersive virtual reality tour of Egmont Key that gives voice to the disappearing island's many untold histories.

Harrison, Laura [78] see Donner, Kristin

**Harrison-Buck, Eleanor (University of New Hampshire)****[80]***Introduction to the Lower Belize River Watershed: A Deep History of Human-Environment Interaction*

This paper situates the results of 10 years of archaeological investigations by the Belize River East Archaeology (BREA) project, beginning more than 10,000 years ago in the preceramic period. We have also documented ample Maya occupation, including their settlement, production activities, ritual ceremonies, and other aspects of daily life. The BREA study area contains over 122 km<sup>2</sup> of perennial wetlands (28% of all wetlands in Belize). Our investigations have documented a long history of human-wetland interaction beginning in the preceramic and continuing through the Maya period. European contact has also been detected, when Spanish entradas penetrated these swamps en route to the Petén. Logwood in these swamps later attracted the British Baymen, who settled in the lower Belize Watershed, including Crooked Tree—today one of the oldest Creole communities in Belize. The archaeology of the Creole, descendants of European and enslaved Africans, has been the focus of our recent investigations. In 2018, BREA worked with the community of Crooked Tree to develop a museum and cultural heritage center. It features the results of the BREA archaeological research, from preceramic to colonial times. The museum is geared for the public, namely local school-age children, aimed at promoting long-term cultural sustainability.

**[80]***Chair*

Harrison-Buck, Eleanor [80] see Craig, Jessica

Harrison-Buck, Eleanor [80] see Kaeding, Adam

Harrison-Buck, Eleanor [80] see Krause, Samantha

Harrison-Buck, Eleanor [80] see Phillips, Lori

**Harrod, Ryan (University of Alaska, Anchorage)****[127]***Why We Study Violent Behaviors in the Past: Dr. Debra Martin's Contributions to Research on Systems of Socially Sanctioned Warfare and Systematic Exploitation*

Dr. Debra Martin's work has enhanced our understanding of how different forms of violent interaction are often culturally sanctioned in society. Her work has revealed the physical and social impact on individuals who sustained violence-related trauma. My scholarship continues her work, and explores the ways human skeletal remains can reveal violent interactions, how these types of exchanges affect people's daily lives and are tied to cultural ideology, and ways the influence of violence transcends multiple generations. Building on the collaborative work we have done together, I illustrate here the biological consequences of persistent threats of violence as a means of social control over individuals. The research I present explores examples of how we can identify and understand conflict in the past, from intergroup hostilities that result in regional warfare, to systems of captivity and exploitation that target women and children and/or nonlocal laborers. Dr. Martin continues to encourage my passion for research on violence. As a collaborator she continues to push me to examine the complex nature of human conflict and how the interaction between individuals between and within groups, both as direct and structural violence, was part of daily practice and ideology in the past.

Harrower, Michael [94] see Woldekiros, Helina

Harry, Karen [96] see Perez, Daniel

Harry, Karen [46] see Van Alstyne, Benjamin

Hart, Isaac [93] see Taylor, William

**Hart, Siobhan (Skidmore College)****[183]***Curating Archaeological Collections in the Private Small Liberal Arts Context*

This paper considers archaeological curation in a private, small liberal arts college (SLAC) context. Many SLACs have

archaeological collections acquired through donation from alumni or local residents, occasionally through purchase or orphaning, and increasingly through student and faculty research on and off campus. These collections are sometimes curated by professional staff in a dedicated museum, but more often are curated within an academic department by a single faculty member. In these situations, faculty-curators must meet legal requirements and ethical imperatives while also advancing institutional missions of active and applied learning. Archaeological collection curation can offer rich opportunities for teaching and student learning. It also requires significant resource investments from institutions and individual faculty. Meeting standards of care and commitments to inclusion, access, and community engagement present both challenges and opportunities in the SLAC context. I consider both with examples drawn from my own experience as a faculty-curator.

Hartman, Gideon [68] see Skosey-LaLonde, Elena

Hartman, Gideon [68] see Vaiglova, Petra

**Hastorf, Christine (University of California, Berkeley) and Melanie Miller (University of Otago)**

**[156]**

*Finding Value: Integrating Multiple Datasets to Clarify the Nuances of Past Food Choices*

Archaeological studies of ancient foodways focus on understanding subsistence practices in terms of the movement of species over space and time, human/plant/animal strategies, ecological transformations, periods of abundance/famine, economics, and politics. The values that foods are imbued with, the meaning and significance they have in a culture at a particular time, can be more elusive when we are limited to archaeological evidence alone. The Taraco Archaeological Project has been completing research on the shores of Lake Titicaca, Bolivia, for some years. Through that work we have gathered and analyzed a range of data that speak to past food ways, including plant and animal remains, phytoliths, ceramics, and stable isotopes. Building on both indigenous ways of engaging with the local landscape, and our multiple datasets, we will discuss the power of combining data to help us think about past foodways and how these different lines of evidence can begin to illustrate the meanings and values of people's decisions. In this presentation we will highlight what we have learned about not just the relative importance of foodstuffs through their presence or absence over time but also the values that residents seem to have imbued to these different foods.

**[156]**

*Discussant*

**[156]**

*Chair*

**Hatcher, Lawford (University of Alabama), Katherine Chiou (University of Alabama), Emily McKenzie (University of Alabama), Caleb Ranum (University of Alabama) and Juan Monzon (University of Alabama)**

**[5]**

*Introducing Paleoethnobotany to Machine Learning: A Case Study in the Genus Capsicum*

Chili peppers (*Capsicum* spp.) are an incredibly diverse and abundant crop across the Americas whose domestication began around 10,000 BP as a complex co-evolutionary process between humans and these plants. This genus has served many culinary, medicinal, and ritualistic uses throughout its evolution and diversification. With an interest in tracking the domestication of the *Capsicum* genus over time, we seek to develop a method of species-level identification based on seed morphometrics. To this end, we test a variety of machine learning algorithms on the collected morphometric data to determine which best models the high-dimensional space of the data. Machine learning algorithms utilized are linear discriminant analysis, neural networks, decision tree, Random Forest, as well as a series of dimensionality reduction algorithms to prevent overfitting. We also compare these models to previous models developed for species-level identification of *Capsicum* seeds. As the only remaining portions of chili pepper at archaeological sites are very often the seeds, these species-level identification models can be utilized in the field to identify the species of seeds found in order to track their domestication over time.

Hauser, Mark [147] see Wallman, Diane

**Hauser, Neil (Coal Creek Research)**

**[21]**

*Investigating a Projectile Point Typology for the Uncompahgre Plateau in West Central Colorado*

The Uncompahgre Plateau has been utilized by humans for at least the last 10,000 years, based on dates from excavated sites in the region. Projectile point styles that have formally been defined and named from type sites throughout the Great Basin occur on the Plateau. However, many that have not been formally defined or named also occur on the Plateau. Previously, Buckles (1972) used points from his excavations to develop a general projectile point chronology, and Berry (2019) obtained radiocarbon dates and used 80 projectile points from recorded sites to refine the chronology and define eight projectile point styles for the area. Our investigation currently utilizes nearly 1,000 projectile points from excavated sites and private collectors to define styles that occur on the Plateau. As expected, this has increased the number of definable styles to over 30. The radiocarbon dates and the associated points (Berry 2019) allow some of our newly defined styles to be associated with a temporal period, but only about half. In addition, a grid of USGS 1:24000 topo maps containing the Plateau are being used to identify any statistically significant differences in spatial occurrences of the styles.

Hauzenberger, Christoph [77] see Brandl, Michael

**Hawkins, Rebecca (Algonquin Consultants Inc.)****[75]***Discussant***Haws, Jonathan (University of Louisville), Nuno Bicho (ICArEHB, Universidade do Algarve), João Cascalheira (ICArEHB, Universidade do Algarve), Mussa Raja (Universidade Eduardo Mondlane) and Milena Carvalho (University of New Mexico)**  
**[151]***Stone Age Archaeology in the Lower Save River Valley, Southern Mozambique*

Southern Mozambique, with extensive Quaternary-aged deposits, shows great potential to inform on early modern human behavior. Despite its geographic proximity to well-known southern African hotspots of Stone Age archaeology, southern Mozambique represents a major gap in our knowledge due to civil war and political instability in the late twentieth century. In 2019, we conducted a reconnaissance survey of the lower Save River valley in the southern half of Mozambique. This area had no previously documented sites, but we chose this valley because of the occurrence of exposed Quaternary gravel and sand deposits along drainages leading into the Save River. The initial survey found that these deposits on the north side of the valley contained abundant raw material in the gravels and lithic scatters dated to the Middle and Later Stone Age. Testing at one locality, Zimura 1, confirmed the presence of stratified deposits in a paleosol exposed in a quarry. Later Stone Age (LSA) were found in a secure context below a buried weathering surface. An OSL age of  $40 \pm 3$  ka provides the oldest dates for the LSA in Mozambique. Here, we report the preliminary results of our testing and survey in the vicinity of Zimura.

Haws, Jonathan [124] see Bicho, Nuno

**Hayeur Smith, Michele (Haffenreffer Museum of Anthropology)****[148]***Invisible Women in a World of Men: The Textile Trade in the North Atlantic, AD 1000–1600*

Waterlogged or deeply buried deposits from medieval harbors in certain northern European towns have produced large and well-preserved textile assemblages that contain a surprising number of non-indigenous textiles. Some of these appear to have originated in the North Atlantic Islands (Iceland, the Faroes, the Hebrides, Shetland, and perhaps Greenland), while others may have been moving from continental Europe to those islands. How did these textiles get there? How were they traded? And how did textiles often labeled as “Wadmol” in medieval documents and known as *vaðmál* in the North Atlantic islands fit within, and flow through, international trade markets linking the North Atlantic with Northern Europe? With the help of strontium isotope analyses conducted through Brown University’s Department of Earth and Environmental Sciences to source the textiles, we have been exploring the roles of women in North Atlantic societies and their involvement in both international textile trade networks and production to meet their own local needs on their farms in the distant islands of the North Atlantic.

**[148]***Chair*

Hayeur Smith, Michele [148] see Steinman, Charles

**Haynes, Hannah and J. Marla Toyne (University of Central Florida)****[14]***Surrounded by the Dead: A Spatial Analysis of Kuelap’s Mortuary Practices, Chachapoyas, Peru*

Kuelap is a monumental archaeological complex in the northeastern Andes that was occupied by the Chachapoya (ca. 500–1470 CE) and Inca (1470–1535 CE). Previous GIS research in the region has involved architecture and watershed analysis of funerary features across the Utcubamba valley. This study uses GIS mapping to investigate the within site spatial distribution of mortuary practices at this site by identifying burials from excavations. We examined several characteristics; burial type, chronology, age-at-death, and sex of individuals. The primary goal was to locate burials and investigate the relationship of these elements. The process started by obtaining site maps. Broad (10 m<sup>2</sup>) and narrow (1 m<sup>2</sup>) grids were used to spatially plot 558 burials. We produced various maps to visualize patterns in different variables. Nearest neighbor analysis showed almost all variables were clustered spatially, except for male burials and female massacre victims. Results demonstrate the dense distribution of burials at Kuelap. Documenting the burials at this site expands avenues of understanding how the Chachapoya community connected with their dead.

**Hays-Gilpin, Kelley (Northern Arizona University)****[60]***Discussant***He, Yahui (Stanford University)****[94]***Agriculture, Alcohol, and Urban Economies in Late Neolithic North China: A Case Study from the Shimao Site*

The late Neolithic period in China witnessed a boost of settlement scale and number, interregional interactions and exchanges, and sociopolitical and economic complexities. The Shimao site, located in the north Loess Plateau, China, was one of the most important urban centers in the Late Neolithic period. Several recent macrobotanical studies have revealed the pivotal role of millets in the urban subsistence of this region. Nevertheless, the discussions of the ways in which food plants, especially millets, were cooked or consumed are still lacking. In this study, the results by employing microbotanical methods will shed light on the consumption of millet-based alcohol and their relationship with sociopolitical and economic complexities in this urban center.

**Headrick, Annabeth (University of Denver)****[51]***Sacrifice and the Sun: The Aztec Calendar Stone and Its Origins*

While many scholars have suggested that the Aztec sacrificed individuals on the Calendar Stone, this paper will not only explore this aspect but also the object's affiliation with another form of sacrifice, auto-sacrifice. Using ethnohistoric records, connections between the imagery of the stone and acts of human sacrifice will expand on why this imagery was deemed appropriate for this ritual act. Furthermore, an argument will be made that the iconography of the monument crystalizes ritual acts, actually recording in stone ephemeral sacrificial events and thereby making the transient permanent. When addressing evidence for the auto-sacrificial symbolism of the monument, the paper will identify iconographic precedents for the imagery on the Calendar Stone, specifically imagery from Palenque and Chichen Itza. Through an exploration of the origins of the monument's imagery, a clear case may be made that not only was auto-sacrifice intrinsic to the Calendar Stone, but also the intimate relationship between rulers and solar-related sacrifice was part of the intended symbolism. In sum, by identifying both related but distinct forms of sacrifice within the imagery, a strong case can be made that royal prerogative intrinsically shaped sacrificial acts of all types.

Heart, Heather [153] see Harle, Michaelyn

**Heath-Stout, Laura (Emory University)****[81]***Pulled In or Pushed Out? Diversity, Discrimination, and the Recruitment of the Next Generation of Archaeologists*

In this Presidential Session, we are exploring how and why archaeology remains dominated by white, straight, and (in positions of power) men. One piece of this puzzle is recruitment of archaeologists, which tends to take place in field schools and academic departments. How do these programs reproduce homogeneity in our discipline? In order to address this question, I use data from my qualitative study of diversity and oppression in archaeology, in which I conducted in-depth interviews with a diverse sample of 72 archaeologists working in Mediterranean, Mesoamerican, and/or historical archaeology and in US higher education contexts. I demonstrate that my interviewees were pulled into or pushed out of academic and research opportunities on the basis of not only their interests and merit but also their social identities. I show that marginalized archaeologists (e.g., women, people of color, queer people) must navigate career paths not only following our interests but also seeking accessible and welcoming opportunities and safety from discrimination and harassment. This process creates an extra cognitive burden for us to bear, making it difficult for us to succeed in the discipline. These conditions limit the diversity of our field.

**Heath-Stout, Laura (Emory University)****[144]***Chair***Heath-Stout, Laura (Emory University)****[190]***Discussant*

Heath-Stout, Laura [144] see Jalbert, Catherine

**Heckenberger, Michael (University of Florida)****[66]***An Archaeology of Hope: How the Past Informs Indigenous Futures in the Southern Amazon's "Arc of Deforestation"*

Two decades of relentless agropastoral development has reduced the closed tropical forests to small patches in most of northern Mato Grosso, within the so-called "arc of deforestation" along the southern margins of the Amazon's closed tropical forests. There are larger blocks in two Indigenous areas, but these too are acutely threatened by public health and environmental problems from agropastoral development, such as desiccation, water pollution and fire susceptibility, and changes in diet and health. Many commentators seek technological innovation or political change to curb the destruction, or not, but archaeology suggests that the past may also offer important clues to managing contemporary change. In the Upper Xingu region, over two decades of ethnohistoric and archaeological documentation have revealed large, densely settled precolumbian populations in the centuries before first European contacts in South America. These societies developed sophisticated systems of land management to support a regional society of 50,000 or more, reduced to 500 people in the mid-twentieth century. Here current problems are considered against this backdrop of deep indigenous history to show how ancestral practices provide "homegrown" solutions to current risks, such as soy, fire, and disease, through robust partnerships with Indigenous populations across the Xingu drainage.

**[66]***Chair***Hedgepeth Balkin, Jessica (University of Colorado, Boulder), Arthur Joyce (University of Colorado, Boulder) and Marc Levine (University of Oklahoma)****[102]***Changes in Settlement, Resource Extraction, and Trade in the Lower Río Verde Valley, Oaxaca, Mexico, between the Late Classic and Late Postclassic Periods (CE 500–1522)*

Michael Lind investigated major sociopolitical changes between the Late Classic and Postclassic periods in Oaxaca, particularly involving Mixtec and Zapotec peoples. His interpretations integrated both ethnohistoric and archaeological evidence. In the lower Río Verde Valley, an ethnohistoric record provides insight into the development of a Late Postclassic Mixtec Empire that was centered at Tututepec. The Mixtec codices and colonial documents describe Mixtec migration to Tututepec, imperial expansion, and



the development of a vibrant tributary economy. This paper presents archaeological evidence focusing on shifts in settlement, resource extraction, and trade between the Late Classic and Late Postclassic periods (CE 500–1522). We highlight new data from a continuation of the regional survey conducted during the 2012–2016 Río Verde Settlement Project (RVSP). Evidence indicates that a major demographic expansion occurred, and settlement shifted to the eastern half of the valley, with a nucleation in the piedmont around Tututepec during the Late Postclassic. Coastal plain survey reveals salt production predominantly using a boiling (*sal cocida*) method. During the Late Postclassic period, salt and other goods were likely used to attract outside merchants bearing copper and obsidian, as suggested by ethnohistoric sources and the recovery of imports on or near salt production sites.

Hedlund, Jonathan [21] see Gilmore, Kevin

**Hegmon, Michelle (Arizona State University) and Kari Schleher (University of New Mexico)**

[2]

*Analyzing Mimbres Pottery Designs with Confidence*

Mimbres Black-on-white pottery from the US Southwest is well known for its beautiful designs and, sadly, also for problems such as looting, fakery, and collection bias. Previous work has documented some of the challenges. The current work develops practical means by which those challenges can be addressed, drawing on a database of Mimbres pottery with designs that depict humans. We begin proceed by defining categories of degrees of confidence: (1) Representative samples; (2) Authentic but from various contexts; (3) Likely authentic; and (4) Unknown. We then proceed by assessing whether and to what extent the lower-confidence categories are different from the representative sample, and thus how they can reasonably be used in research. Happily, results show that the lower confidence categories can be used in qualitative research. For example, some of the most intriguing designs, such as those that depict birth scenes, intercourse, and sexual jokes, are found on bowls that are known to be authentic.

Hegmon, Michelle [91] see Schwartz, Christopher

**Heidkamp, Blair (University of Texas), Anya Gruber (University of Texas), Manda Adams (University of Texas), Mercedes Wong (University of Texas) and Arlene Rosen (University of Texas)**

[29]

*Holocene Perspectives from the Gobi Desert: New Paleoethnobotanical and Geoarchaeological Analyses at Delger Khan Uul, Mongolia*

The archaeological site of Delger Khan Uul is located in southeastern Mongolia near the eastern Gobi Desert. Today, the climate is semiarid with cold winters and warm summers, but the region has experienced dramatic changes since the beginning of the Holocene with intervals of warm and cool periods. Utilizing lake cores we can gauge climatic trends for the greater region and assess the external factors which may have influenced the local environment at Delger Khan Uul. Using samples taken from the excavations, we take a more refined look at the climate of Delger Khan Uul since the early Holocene, using phytolith analysis, grain size analysis, magnetic susceptibility, and mass spectrometry. Using this suite of methods and proxies alongside archaeological evidence of human occupation in this area, we characterize the long-term environmental changes and progression of landscapes in southeastern Mongolia with a particular focus on the impact of anthropogenic settlement.

**Heilen, Michael (Statistical Research Inc.) and Shelby Manney (Arizona Army National Guard)**

[49]

*Digital Data Collection and Management: Where Do We Go from Here?*

The vast majority of archaeological investigation in the United States is conducted in compliance with preservation laws as part of cultural resource management (CRM) efforts. CRM studies have explored a wide range of social, temporal, and environmental contexts and are producing an ever-increasing volume of archaeological data. More and more data are born digital and many legacy data are digitized. New data standards and management systems are being developed and efforts are underway to integrate and synthesize data at grand scales. While CRM studies are funded by taxpayer dollars and are intended in spirit to promote historic preservation and provide public benefits, the resulting data are difficult to access and inter-operationalize and are rarely collected and managed with their long-term security, accessibility, and ethical reuse in mind. Momentum is building toward open data and open science as well as Indigenous data sovereignty and governance. CRM is reaching a critical point where consideration of diverse constituencies, concerns, and requirements is needed to plan data collection and management approaches moving forward. This presentation introduces a session focusing on data collection and management in CRM and provides an example of how the Arizona Army National Guard is striving to address these issues.

[49]

*Chair*

**Heitman, Carrie (University of Nebraska, Lincoln)**

[79]

*Discussant*

**Helmke, Christophe (University of Copenhagen) and Sergei Vepretskii (Knorozov Mesoamerican Centre, Russian State University)**

[76]

*An Account of the Kings of Kanu'l as Recorded on the Hieroglyphic Stair of K'an II of Caracol*

Much remains unknown as to the hieroglyphic stair dedicated by AD 642 by K'an II, the great king of Caracol. Constituent panels

were discovered at a number of different sites, including Caracol, Ucanal, Naranjo, and Xunantunich. The most recently discovered panels contribute greatly to our understanding of this fascinating monument and the tumultuous decades of the Kanu'l dynasty. Thanks to the recent discoveries, many gaps have been closed, with Panels 3 and 4 standing out as bookends of this great narrative. Panel 4 at Xunantunich opened the narrative that adorned the hieroglyphic stair and makes a surprising statement right from the onset, clarifying that political authority was resolutely established at Calakmul. This is bold statement serves as a synoptic précis for the entire hieroglyphic stair. As such, the deeds of K'an II are related, but only to the extent that they can be interwoven with the actions of the Kanu'l lords, tracked from the vantage point of a close ally. These monuments attest to the fissioning of the Kanu'l dynasty and its eventual restoration at Calakmul, from whence much of Classic Maya politics would be overseen during the remainder of the seventh century.

Helmke, Christophe [48] see Morales-Aguilar, Carlos

Helmke, Christophe [101] see Nielsen, Jesper

Helmke, Christophe [158] see Stemp, W. James

#### **Henderson, A. Gwynn (Kentucky Archaeological Survey)**

[75]

*Discussant*

Henderson, A. Gwynn [91] see Pollack, David

Hendon, Julia [144] see Herr, Sarah

#### **Hendrickson, Mitch (University of Illinois, Chicago), Stéphanie Leroy (CNRS-LAPA-IRAMAT), Enrique Vega (CNRS-LAPA-IRAMAT) and Kaseka Phon**

[150]

*Iron Scales: Reconstructing the History and Organization of Angkorian Iron Smelting around Phnom Dek, Cambodia (Ninth to Fifteenth Centuries CE)*

The Phnom Dek, or "Iron Mountain," in central Cambodia is the center of the largest iron production region in mainland Southeast Asia. Spanning over 1,400 years of metallurgical activity, the most intensive evidence of smelting across this vast region corresponds with the expansionary phases of the Angkorian Khmer Empire (eleventh to thirteenth centuries). Integrated, multiscale analysis of objects, the mound, the smelting site, and landscape using GIS and archaeometallurgical approaches provides new insights into the history and social organization of smelting communities, rituals of production, and identity of ironworkers during this dynamic period in Southeast Asia.

#### **Heng, Piphai (Northern Illinois University), Miriam Stark (University of Hawai'i, Manoa), Alison Carter (University of Oregon) and Rachna Chhay (APSARA National Authority, Cambodia)**

[150]

*Urban Life Histories, Long-Term Angkorian Urbanism, and the Kok Phnov Site*

Angkor was premodern Southeast Asia's largest city from the ninth to fifteenth century. Centered in northwest Cambodia near the Tonle Sap Lake, this agro-urban agglomeration comprises extensive settlements linked through a series of road and water management systems. Research on Angkorian urbanism has focused on either its monumental architecture or shifts in general settlement planning throughout its life history. During the city's early phase of development, ritual and habitation spaces were oriented axially in an open and loosely structured system. During the twelfth–thirteenth centuries, Angkor increased in density and shifted to a highly structured and gridded settlement plan. However, this did not take place uniformly across the civic-ceremonial center. This paper discusses these changes using two components of Angkor's urban space: the Eastern District and its associated neighborhoods. Located adjacent south of the East Baray, this area became an affluent urban space surrounding the tenth-century Pre Rup state temple. Blending excavation and spatial data from Kok Phnov site and its surrounding area offers insights into the social construction of and resilience in Angkorian neighborhoods within the Eastern District. Angkorian urbanism was dynamic and characterized by continuities and changes in occupation density and social structure throughout its life history.

#### **Henkin, Joshua (Field Museum of Natural History)**

[133]

*Interdisciplinary Collaboration and Capacity Building for Characterizing Plant Exudates: On Supporting the Resilience of Future Endeavors in Residue Analysis*

Interdisciplinary collaboration is essential when it comes to characterizing plant exudates and other archaeological residues. But how do we push the ball forward and become confident that we are producing new insights into material culture from our work, especially at this time when collaboration has become severely complicated by the COVID-19 pandemic and top-down austerity conditions in universities and museums? Assembling teams of people that span the disciplines of analytical chemistry, botany and ethnobotany, archaeology, anthropology, history, and conservation science is no easy task. Recent innovations in handheld and portable analytical instruments as well as minimally destructive/invasive technologies should help to produce pilot projects yielding meaningful results and to solidify efforts into long-term collaborations focused on plant exudates. One should not forget, though, that new tools alone cannot be leveraged without the proper personnel. I submit that the only reliable way to advance these goals is through the firm commitment by social science programs to in-house capacity building. There are different strategies to save money in purchasing equipment while gaining know-how, but there is no long-term substitute for paying people for their time. My experiences with *Schinus molle* L. (source of guaribay resin) and other anecdotes will serve as illustration!

Henkin, Joshua [133] see Bisulca, Christina  
 Henkin, Joshua [133] see Cank, Kristof

**Henry, Aureade (CNRS - University Cote d'Azur), Julie Esdale (University of Colorado) and Kelly Graf (Texas A&M University)**  
**[34]**

*New Archaeobotanical Data from the Late Pleistocene Occupations of McDonald Creek*

What can archaeobotany tell us about past landscapes and human behavior at McDonald Creek during the Late Pleistocene? Since 2016, systematic charcoal and phytolith sampling has been performed at McDonald Creek with the following aims: (1) reconstruct the ligneous vegetation and investigate firewood management practices, and (2) test the potential of phytolith analysis to provide not only paleoenvironmental, but also paleoeconomic data. The results obtained so far on charcoal and phytolith assemblages from component 1 (Bölling/Allerød interstadial, just after 14,000 ky BP) and 2 (Younger Dryas, around 12,600 ky BP) indicate that the occupations took place within a similar shrub-tundra landscape, while pronounced taxonomic choices operated in favor of willow (*Salix* spp.) for fuel. The phytolith morphotypes identified at McDonald Creek are coherent with the ones found in similar environments. However, some assemblages are characterized by abnormally high proportions of "platelet" and "jigsaw puzzle" morphotypes, indicating a deliberate input of angiosperm leaf material, which could have taken place only during the summer, maybe in order to fulfil specific hearth functions. Thus, our results have important environmental, seasonal, and behavioral implications that are discussed in this poster in light of current archaeological and ethnoarchaeological data.

Henry, Aureade [52] see White, John

**Henson, Devin (College of Wooster) and Olivia Navarro-Farr (College of Wooster)**  
**[12]**

*Reconsidering the Late Woodland: A Critical Reassessment through Decolonizing Approaches*

The Late Woodland period in eastern North America has traditionally been conceptualized as a cultural hiatus between the region's Hopewell and Mississippian traditions. As a drastic (though not complete) reduction in the practices of monumental architecture and art produced with nonlocal materials occurred during this time, the end of the preceding Hopewell tradition (and its related Interaction Sphere) has been depicted as a "collapse" or "devolution" by multiple researchers. However, the Late Woodland also saw a rapid rise in population, intensification of agriculture, increased sedentism, and technological innovation. Although the combination of these factors and the period's architectural and artistic reduction appear contradictory, I argue that this contradiction stems from improper applications of evolutionist thought and outdated notions of cultural progress. The ways in which archaeologists (and the communities with whom they can interact) perceive this period in the Eastern Woodlands must be reassessed. Through the adoption of decolonizing approaches, I reconsider the Late Woodland period as a dynamic and crucial transition central to the history of the region.

**Hepp, Guy (California State University, San Bernardino)**  
**[135]**

*Revisiting the Early Oaxacan Village: New Perspectives on Some of Mesoamerica's First Settled Communities*

Since its publication in 1976, *The Early Mesoamerican Village* has been a landmark for the systematic study of early settled communities. Based on research in the Valley of Oaxaca, *EMV* has helped many students of archaeology to better understand household and community organization and broader concepts of survey and sampling. Scalar approaches of *EMV* to the region, site, household, and activity area, became foundational reading in the discipline. *EMV* also comprises a series of case studies assessing systems theory models and ecological functionalism, sometimes finding these unsupported in favor of sociopolitical factors. Among the interpretations proffered by *EMV* that carried the most weight in subsequent research by Flannery and Marcus is that of public/private spatial dichotomy and gendered divisions of labor, with women and men occupying discrete spaces and employing dichotomous material culture in their daily lives. In this presentation, I discuss how new findings and theoretical approaches, including those focused on agency and materiality, are changing our understandings of early Mesoamerican villages. With particular emphasis on Early Formative (2000–1000 BCE) contexts, I argue that there is still much to learn from *EMV* but that its concepts of public/private space and gender, in particular, need revision.

**Hernandez, Christine (Tulane University)**  
**[59]**

*The Role of History, Ancestry, and Alliance in the Place of Noxtepec, Guerrero, Mexico*

In the special collections of the Latin American Library at Tulane University is a tracing made by William Sprattling of an original *lienzo* map centered on the town of Noxtepec, Guerrero. Painted by a *tlacuilo*, the *lienzo* likely dates to the end of the sixteenth century. This little-known piece exemplifies the carto-historic genre of Native map-making that became a popular means employed by Native towns in New Spain to document their communal history and their leader's ancestry in order to keep control of lands and properties. In this paper, I highlight those aspects of the *Lienzo de Noxtepec* that speak of a town history that extends into the prehispanic period. Exploits like a defeat of the Aztecs, acceptance of Christianity, and fealty to Spanish authority, I contend, would also have helped to enhance the town's standing among its neighbors in an ethnically diverse and dynamic province of the former empire. Native communities in the Puebla-Tlaxcala region used a similar strategy in later pictorial documents like the *Lienzo de Tlaxcala* created and encoded with a history of alliance with Cortés and conversion to Catholicism to support claims by Native elites to land and tribute promised to allies of the Spanish conquistadores.

Hernandez, Enrique [48] see Paine, Richard

**Hernández Garavito, Carla (Wake Forest University)****[157]***Inka Materiality in Local Practice: A Case Study from Huarochirí (Lima, Peru)*

The results from archaeological excavations on a residential settlement and a ritual-public center in Huarochirí suggest minimal use of Inka-style material culture in most everyday life contexts. At the same time, architectural intervention suggests a significant transformation on both sites' layouts. Building on historical sources and comparative research, I propose that the selective pattern of incorporation, even with the substantial architectural transformation built on the local idea of the Inka as kin rather than a conqueror. I content that in local-based historical documents, the indigenous people of Huarochirí actively portrayed the Inka people and the Inka himself as subject to their local ancestral deity. Specifically, I focus on ceramic vessels as one of the most visibly Inka elements in material culture and investigate their use and interaction with local styles. Ultimately, this paper aims to investigate the intersection between the significant role of Inka-style ceramics in portraying Inka imperial logics, and the role of local ritual and belief systems in defining how and where such material culture was used within two distinct types of local sites.

**[157]***Chair*

Hernández Juan, José Ignacio [119] see Arieta Baizabal, Virginia

**Hernández Sariñana, Daniela (Boston University)****[101]***Domestic Life and Ceramic Consumption in Tlajinga, Teotihuacan*

Tlajinga is the southernmost district of Teotihuacan, a cosmopolitan city that thrived in Central Mexico during the Classic period. Previous research done in this neighborhood includes surface collection associated with the Teotihuacan Mapping Project and the excavation of one compound, designated 33:S3W1 during the 1970s. Recent investigations carried out by the Proyecto Arqueológico Tlajinga Teotihuacan (PATT) have yielded new data concerning the ceramic chronology and domestic lifeways in apartment compounds. Two compounds (17:S3E1 and 18:S3E1) were explored beginning in 2012, and two platforms that formed part of a barrio center were excavated in 2019. The analysis of ceramics at the household level provides different social insights into provenience, trade and exchange networks, technological changes, consumption patterns, and larger-scale sociocultural preferences. The typological and microscopic ceramic analyses generate diverse lines of evidence that aid our understanding of ceramic consumption in Tlajinga with implications for refining the chronology of the city and for its broader impact and distribution over centuries of occupation.

Hernández Sariñana, Daniela [101] see Carballo, David

**Herr, Sarah (Desert Archaeology Inc.)****[60]***Discussant***Herr, Sarah (Desert Archaeology Inc.) and Susan Stinson (Office of Archaeological Studies)****[81]***Achieving Safe Workplaces in Cultural Resources Management*

In this paper we will take a three-part approach to examining and achieving safe workspaces in cultural resource management (CRM), considering demography, reports of harassment and assault in the workplace, and solutions. First, we will provide a snapshot of the participation of women and men in private and public sectors CRM jobs. Second, we will look at who is reporting harassment and try to get a sense of the scale of the problem. Finally, we will discuss solutions, including achieving equity in the workplace, attention to corporate culture, and broadening responsibility for reporting and resolution. We will draw from new and existing datasets and reports, including those of the Society for American Archaeology, the Society for California Archaeology, the Southeast Archaeological Conference, and the American Cultural Resources Association.

**Herr, Sarah (Desert Archaeology Inc.), Lynn Gamble (University of California, Santa Barbara), Julia Hendon (Gettysburg College), Calogero Santoro (Universidad de Tarapacá, Chile) and Christina Rieth (New York State Museum)****[144]***Assessing Diversity in the Society for American Archaeology Journals*

The three peer-reviewed journals of the Society for American Archaeology—*American Antiquity*, *Latin American Antiquity*, and *Advances in Archaeological Practice*—are available to all members of the SAA electronically, but have different readerships, distinct submission bases, and individual cultures of practice and production. The editors share a desire to increase diversity and achieve equity along a variety of different axes. In this presentation, we share data—as available—about gender and geographic diversity in submission rates, publication rates, peer review, and readership. As we consider what is behind these trends and comment on our successes, attempts, and failures, we ask for a broader study of equity in archaeological practice and publication so that our journals, in the future, will better reflect the membership of the Society and the global archaeological community.

**Herrera, Roberto (Medgar Evers College CUNY) and Francisco Corrales-Ulloa (Museo Nacional de Costa Rica)****[178]***Complexity during the Aguas Buenas Period of Greater Chiriquí: Initial Comparisons between El Cholo, Cantarero, and Pejeperro Sites, Southern Costa Rica*

The development of precontact social hierarchy in southern Central America is a subject open to debate. For the Aguas Buenas period (300 BC–AD 800) of the Greater Chiriquí archaeological region, new data at the regional level (Costa Rica, Panama) indicate

the appearance of centers with architectural complexity after AD 400. This paper offers an initial comparison among three contemporaneous sites with extensions of several hectares and the presence of artificial mounds: El Cholo, located in the Upper General Valley, Cantarero in the Tigre River basin in the interior of the Osa Peninsula, and Pejeperro, on the peninsular southern coast. El Cholo and Cantarero exhibit cobble architecture with the latter also showing extensive terrain modification and smaller surrounding settlements. We explore the question of variable site function and formation and propose alternatives for understanding this diversity amid an overarching model of social complexity and regional interaction. We also discuss aggrandizement and collective leveling mechanisms, reviewing evidence for strategic geographic placement and its possible role in the control of staple resources, raw materials, and extra-local goods. Finally, we review ecological variability and its possible influence on local and interregional social dynamics.

[178]

Chair

Herrera-Santos, Yoanna [177] see Elliott, Michelle

Herrera-Schneider, Alexandra [98] see Evans, Amanda

**Herrmann, Edward (Indiana University Museum of Archaeology and Anthropology)**

[36]

Chair

Herrmann, Edward [52] see Friberg, Christina

Herrmann, Edward [97] see Krus, Anthony

Herrmann, Edward [52] see Massey, David

Herrmann, Nicholas [32] see Ahlman, Todd

Herrmann, Nicholas [32] see Black, Reece

Herrmann, Nicholas [32] see Bowden, Taylor

Herrmann, Nicholas [32] see Green, Olivia

Herrmann, Nicholas [32] see Rodriguez, Katherine

Herrmann, Nicholas [32] see Siegert, Courtney

Herrmann, Nicholas [32] see Stainton, Adrienne

**Herron, Molly (University of Wyoming), Madeline Mackie (University of Wyoming) and Todd Surovell (University of Wyoming)**

[192]

*Identification of Fragmented Mammoth Ivory in Archaeological Sites Using SEM Microscopy*

Although mammoth ivory appears distinctive from other organic materials when found in large pieces, many morphological characteristics that distinguish ivory—such as Schreger lines—cannot be easily identified in small fragments. However, other characteristics, including dental tubules and canals, can be microscopically identified. In this study, I establish a methodology for identifying sub-centimeter ivory fragments using a scanning electron microscope (SEM). After blind testing this method, I then apply it to the fragmentary faunal remains from the La Prele Mammoth site, a Clovis mammoth kill/scavenge and campsite from Converse County, Wyoming. Fragmentary pieces of ivory have been identified in multiple excavation blocks, suggesting that the Clovis occupants were processing and sharing ivory across the site. This method for identifying sub-centimeter ivory has applications at other archaeological sites with fragmentary faunal collections.

Herron, Molly [13] see Hladek, Kenneth

**Hertfelder, Paula (Binghamton University), Alejandra Abrego (INAH) and Cinthia Campos (Binghamton University)**

[10]

*Integrating UAV-Based Photogrammetry, Digital Data Collection, and GIS during the Trincheras Tradition Project Excavations*

The Trincheras Tradition Project is an ongoing collaborative effort to better understand the prehispanic past of Northwest Mexico. Led by Dr. Randall McGuire and Elisa Villalpando, researchers from Binghamton University and the Instituto Nacional de Antropología e Historia (INAH) spent two field seasons in 2017 and 2018 excavating three Trincheras Tradition sites in Sonora, Mexico: El Póporo, San Martín, and La Potranca. This project involves the first intensive excavations of Trincheras sites dating before AD 1200. This poster documents how project researchers integrated an Unmanned Aerial Vehicle (UAV), Filemaker, and ArcMap to photograph and map features and artifacts during archaeological excavation. UAV photogrammetry provided aerial imagery and a digital elevation model of each site. In addition, the UAV provided high quality images of features. All feature maps were drawn digitally with tablets in the field and georeferenced into ArcMap. Other data from artifact, soil, and pollen analyses are also designed to be joined with the project GIS. Integrating these technologies allowed for more streamlined data entry and improved visualization of spatial information.

Hewitt, Anthony [29] see Esh, Kelley

Higham, Tom [130] see Becerra-Valdivia, Lorena  
 Higham, Tom [97] see Griffiths, Seren

Hildebrand, Elisabeth [24] see Kelsey, Brady

Hildebrand, John [1] see Morris, Margaret

**Hill, Matthew (University of Iowa), Erik Otárola-Castillo (Purdue University) and Melissa Torquato (Purdue University)**  
**[13]**

*Long-Term Dietary Change among Hunters of the North American Great Plains*

The 13,000-year-long record of hunting by North American Great Plains populations is often portrayed as an almost exclusive reliance on large-bodied prey, such as bison. This simplified perspective ignores temporal and regional variability in environmental conditions and changes in human-prey dynamics, making exclusive reliance on a single taxon unlikely. The alternative perspective, held by many archaeologists, that the importance big game hunting in Great Plains economies is greatly exaggerated. These claims are usually not derived from empirical analysis of long-term zooarchaeological evidence. In order to develop a more accurate view of long-term dietary changes in the Great Plains, we employ a large dataset of faunal remains from more than 200 sites, and investigate the broad patterns of dietary specialization and diversification used by Great Plains Indigenous people over the past 13,500 years. Our analyses find 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 or 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.

**Hills, Kendall (University of Illinois, Chicago) and Aldo Foe (University of Illinois, Chicago)**  
**[150]**

*Regional Analysis and Monumentality in Southeast Asia: Case Studies from Cambodia and Indonesia*

Multi-sited regional analyses have generally been viewed as incompatible with studies of monumental architecture. A focus on style and iconography, combined with difficulties in collecting spatially dispersed and large amounts of architectural data, have traditionally resulted in political geography and architecture becoming two separate lines of inquiry in Southeast Asian archaeological research. In other study areas, regional analysis has been effectively used to answer anthropological questions regarding religious change, economic practices, processes of state formation and collapse, and adaptation to environmental change, among others. Monumental architecture, as a material manifestation of the above, can offer a valuable lens through which archaeologists can study cultural processes, particularly when used in conjunction with a regional approach. In this paper, we exhibit potential applications of regional analysis using monumental architecture to answer questions regarding processes of Southeast Asian political organizations. Focusing on sites in Angkorian period Cambodia and Early Modern period Indonesia, we look at religious architecture in relation to their political geography. Using GIS, emphasis is placed on spatial and diachronic analysis of site locations with regard to geographic variables. This approach allows for the integration of architectural analysis into broader regional-landscape studies to explore issues of statecraft and political economy.

Hiquet, Julien [104] see Arnould, M. Charlotte  
 Hiquet, Julien [181] see Lemonnier, Eva

**Hirniak, Jayde (Arizona State University)**  
**[40]**  
*Chair*

Hirschfeld, Nicolle [191] see Bowland, Lucyna

**Hitchings, Philip (University of Toronto) and Edward Banning (University of Toronto)**  
**[173]**

*The Use of Bayesian Allocation for the Optimization of Archaeological Survey Effort*

Today, many archaeological surveys have the goal of documenting, as completely as possible, the locations and character of sites, many of which are rare, unobtrusive, or both. Increasingly over the last three decades, archaeologists have used predictive models in a GIS to help them target spaces that are most likely to contain sites of interest, or sites under threat. However, they have largely ignored the very useful method of Bayesian allocation, which uses prior information to optimize the distribution of survey effort over space, in an iterative fashion, so that the survey finds more sites, or finds particular sites more quickly and with less cost. With examples from Cyprus and Jordan, we demonstrate how we use prior knowledge about landscapes, coverage estimates, and number of surveyors available to allocate survey effort each day, with daily updates on coverage to provide new priors for the next day's allocation. This has been successful for the detection of rarely discovered site types, such as Epipaleolithic and early Neolithic sites in Cyprus, and Late Neolithic sites in northern Jordan.

**Hixon, Sean (University of California, Santa Barbara), Kristina Douglass (Pennsylvania State University), Brooke Crowley (University of Cincinnati) and Lucien Rakotozafy (Institut de Civilisations-Musée d'Art et d'Archéologie, Madagascar)**  
[72]

*Late Holocene Spread of Pastoralism Coincides with Endemic Megafaunal Extinction on Madagascar*

Recently expanded estimates for when humans arrived on Madagascar (up to ~10,000 years ago) are based on limited data yet highlight questions on the causes of the island's relatively late megafaunal extinctions (~2,000–500 years ago). Introduced domesticated animals could have contributed to extinctions through competition, but the arrival times and past diets of exotic animals are poorly known. Here, we use radiocarbon and stable carbon and nitrogen isotope data from introduced ungulates (cattle, ovicaprids, and bushpigs,  $n = 57$ ) and endemic megafauna (pygmy hippopotamuses, giant tortoises, and elephant birds,  $n = 65$ ) to test the potential for competition between livestock and endemic megafauna in southern and western Madagascar. Radiocarbon dates confirm that introduced and endemic herbivores briefly overlapped chronologically in this region between at least 1000 and 800 calendar years before present (cal BP). Moreover, stable isotope data suggest that ovicaprids, tortoises, and hippos had broadly similar diets and may have exploited similar habitats. These data support the potential for past direct and indirect forms of competition between introduced and endemic herbivores and add to the growing body of evidence that changes in human subsistence strategies and land use related to pastoralism contributed to the late megafaunal extinction on Madagascar.

**Hladek, Kenneth (University of Wyoming) and Molly Herron (University of Wyoming)**

[13]

*Under the Scope: Nondestructive Methods of Analyzing Perishable Artifacts in Legacy Collections*

This research presents the macroscopic and microscopic attributes of hair and feathers from the artifact assemblage of North Fork Cave #1, better known as Mummy Cave (48PA201) in Park County, Wyoming. The results of this research enable us to better understand the mammalian and avian resources exploited during the Archaic and Prehistoric periods in the Greater Yellowstone Ecosystem. We identify mammalian and avian species native to the region such as bighorn sheep (*Ovis canadensis*), beaver (*Castor canadensis*), Cooper's Hawk (*Accipiter cooperii*), and black-billed Magpie (*Pica hudsonia*). We also detail the cultural exploitation of non-edible resources in the canyon of the North Fork of the Shoshone River, discussing how the site's occupants utilized these animals' hides and feathers in their material toolkit. These nondestructive methods of analysis allow us to make insights into the cultural implications of hide and feathers without destroying these perishable artifacts.

**Hockett, Bryan (Bureau of Land Management)**

[34]

*Preliminary Analysis of the Fauna from the McDonald Creek Site*

McDonald Creek contains identifiable faunal remains from two primary climatic and cultural time periods: (1) a Younger-Dryas aged occupation, and (2) a pre-Clovis aged occupation dating to ca. 14,000 cal BP. The ca. 14,000 cal BP occupation contains most of the well-preserved fauna. To date, identified fauna from the pre-Clovis aged occupation at McDonald Creek includes a diverse zooarchaeological assemblage consisting of mammoth, steppe bison, caribou, swan, grouse, wolf/domestic dog, fox, and hare. Additional identifications will expand this diverse suite of animals exploited at McDonald Creek.

**Hodgetts, Lisa (University of Western Ontario), Kisha Supernant (University of Alberta), Natasha Lyons (Ursus Heritage Consulting), John Welch (Simon Fraser University) and Marie-Pier Cantin (University of Western Ontario)**

[81]

*Power and Practice, Trauma and Resilience: Exploring the Experiences of Canadian Archaeologists*

How do different archaeological practitioners experience and navigate the power inequities built into our disciplinary institutions? Our 2019 online survey of Canadian archaeologists gathered information from over 550 students and practitioners. It explored experiences of sexual and nonsexual forms of harassment, violence, discrimination, and exploitation in educational and professional settings across all disciplinary sectors, and collected information on respondents' gender identity, sexual orientation, ethnicity, age, and seniority. In this paper, we present the results of our analysis of written responses to several open-ended survey questions, and of follow-up interviews with respondents from a range of backgrounds, to explore how intersections of identity shape people's experiences and career trajectories in Canadian archaeology. We also examine and problematize the concept of resilience; how people process and frame their own negative experiences in the discipline and the responses of others to such experiences. We suggest that steps toward a more inclusive and equitable archaeology in Canada and beyond should embrace an ethics of care framework and develop principles of community. Both enable less hierarchical approaches to decision making, spotlight power inequities, and underscore our responsibilities to one another within our communities of practice.

Hodgetts, Lisa [179] see Lyons, Natasha

Hodgins, Greg [97] see Kessler, Nicholas

Hodgkins, Jamie [28] see Brun, Catherine  
Hodgkins, Jamie [40] see Keller, Hannah

Hoedl, Lucas [97] see Kessler, Nicholas

Hoffman, Brett [38] see Jamison, Gregg

Hoffman, John [87] see Morgan, Linda

**Hoffman, Nancy (Minnesota Historical Society)**

**[153]**

*Janet D. Spector*

Janet D. Spector is best known for her groundbreaking work in Feminist Archaeology and collaborative research but she also made significant contributions beyond archaeology. Spector helped form the Women's Studies Department at the University of Minnesota in 1973, the first in the nation to offer a major in women's studies. And in the wake of *Rajender v. University of Minnesota* (a landmark class action lawsuit dealing with sexual discrimination in the academy), she was tapped by university administrators to head a special Commission on the Status of Women. Using an anthropological approach, Spector began a series of ethnographic interviews with faculty, staff, and students to evaluate conditions in order to improve the campus climate. In all of her work, Spector sought to challenge existing structures of knowledge using the same integrated, multivocal approach that characterized her work in archaeology.

Hofman, Courtney [72] see Rayfield, Kristen

Hofman, Courtney [30] see Singleton, Robin

Hofman, Courtney [174] see Wright, Sterling

**Hoggarth, Julie (Baylor University), Tia Watkins (University College London), Claire Ebert (University of Pittsburgh) and Sylvia Batty (Institute of Archaeology, National Institute of Culture and History)**

**[43]**

*The Impacts of the Coronavirus Pandemic on Women in Archaeology*

Numerous studies have demonstrated the most immediate impacts of the Coronavirus pandemic upon the sciences have fallen on younger women and women with young children. These studies highlight how social crises, such as global pandemics, exacerbate existing disparities in social, political, and economic structures. To date no study has yet identified its immediate impacts upon women within the field of archaeology. Here, we describe the results of a survey of archaeologists working in various professions associated with archaeology (academia, CRM, museums, government, other) to identify the economic, workplace, personal, and mental health impacts of the pandemic over its first nine months. This survey will be used as a baseline for the impacts of the global pandemic on working archaeologists (of all genders, but highlighting the impacts on women) into the future, highlighting recommendations that institutions and workplaces can implement to mitigate the long-term impacts of the pandemic for at-risk groups.

Hoggarth, Julie [25] see Ebert, Claire

Hoggarth, Julie [23] see Saldaña, Gabriela

Hoggarth, Julie [152] see Shaw-Müller, Kyle

Hoggarth, Julie [152] see Walden, John

**Holcomb, Justin (Newcastle University), Lisa-Marie Shillito (Newcastle University), Alicia Sawyer (Newcastle University), Karl Wegmann (Malcolm H. Wiener Laboratory for Archaeological Science) and Panagiotis Karkanas (Malcolm H. Wiener Laboratory for Archaeological Science)**

**[95]**

*Microarchaeological Approaches to the Identification of the Younger Dryas in the Northern Great Basin*

The Younger Dryas Chronozone (YDC) is a cooling event occurring 12,900–11,600 years ago (cal BP) marked by rapid changes in plant and animal communities, subsequently affecting late Pleistocene human population organization and settlement dynamics across the globe. In North America's Northern Great Basin, these changes appear to have positively affected mobile foragers, but a lack of well-dated archaeological sites in the region hinders our ability to test this hypothesis or to adequately understand its role in shaping the archaeological record. Thus, there is a need for more datable archaeological occupations and high-resolution studies of Pleistocene-aged deposits in the region. At the Paisley and Connley Caves, stratified deposits have yielded rich Western Stemmed Tradition assemblages spanning the YDC, providing a unique opportunity to address this issue. We present ongoing geoarchaeological research at each site and discuss both the macro- and microscopic characteristics that help define the YDC. These data provide a powerful approach for disentangling human-environment dynamics taking place during the late Pleistocene and early Holocene transition in the Great Basin.

**Holcomb, Justin (Newcastle University)**

**[172]**

*Discussant*

**Holdaway, Simon (University of Auckland), Matthew Douglass (University of Nebraska, Lincoln) and LuAnn Wandsnider (University of Nebraska, Lincoln)**

**[49]**

*The Significance of Surface Artifact Scatters: Case Studies from Australia and North America*

The three authors research surface archaeological records dominated by scatters of lithic artifacts, a class of archaeological data frequently encountered during CRM projects in areas of North America and Australia. We each began researching surface lithic scatters for different reasons but converged on approaches that emphasize the formation of these forms of archaeological record. Through a variety of projects, we asked a common set of questions about the processes that both buried and exposed these



records, the methods needed to obtain a chronology in different regions, and the ways we might interpret artifacts found together in different densities. Answering these questions led to the collection and analyses of datasets in innovative ways and the questioning of a number of archaeological categories often thought of as fundamental for archaeological research. Here we review our respective projects and consider the implications for CRM projects dealing with surface lithics.

**Holliday, Vance (University of Arizona)**

[172]

*Discussant*

**Holly, Donald (Eastern Illinois University), Christopher Wolff (University at Albany, SUNY), James Williamson (Memorial University) and Jessica Watson (University at Albany, SUNY)**

[103]

*Hearth and Home at Sabbath Point: A Beothuk Housepit on Red Indian Lake, Newfoundland*

We report on recent excavations at an unusual Beothuk housepit feature located on Red Indian Lake, in the interior of the island of Newfoundland, Canada. The housepit is remarkable for its large size and hexagonal shape, for having escaped destruction from logging, flooding, and earlier avocational investigations, and for the fact that it does not appear to have been embedded within a cluster of other housepits. Furthermore, excellent faunal preservation and material evidence suggesting that the house was occupied toward the end of the eighteenth century, offer an extraordinary opportunity to investigate Beothuk lifeways at a critical point in the history of these people. In this paper we discuss our archaeological research at the site and situate these findings within the broader context of what is known of Beothuk architecture and settlement organization at the end of the eighteenth century.

[103]

*Chair*

Holmes, Charles [21] see Holt, Evan

**Holt, Evan (University of Wyoming), Brian Wygal (Adelphi University), Kathryn Krasinski (Adelphi University), Charles Holmes (University of Alaska, Fairbanks) and Barbara Crass (Museum of the North)**

[21]

*A Statistical Analysis of Lower Component Lithic Data from the Holzman South Site, Shaw Creek Flats, Alaska*

Archaeologists have long-recognized that post-depositional processes can affect site deposits and that these processes may introduce substantial biases in the interpretation of sites and assemblages. A frequent assumption is that, barring stratigraphic disturbances, thin, well-defined stratigraphic layers are discrete and meaningful archaeological units, but vertical mixing of archaeological deposits can cause errors in interpretations, particularly with respect to occupation history and the age of archaeological components. To reconstruct the occupation history of a site, therefore, it is critical to have some understanding of the degree to which sites are vertically intact. Another aspect of this study pertains to the horizontal, spatial distribution of chipped stone artifacts and refits. Statistically significant patterns in the horizontal dispersion of artifacts give insight toward the use of space at this site. Refitting of chipped stone artifacts and statistical analysis of lithic data are the two means of gaining insight on spatial patterning and vertical mixing I use in this project. In this study, I analyze the vertical distribution of refits and spatial patterning of artifacts at the Holzman South site (XBD-422) in the Tanana River Valley of Interior Alaska to contribute to our understanding of these aspects of site formation and function.

**Homan, Michael (Xavier University of Louisiana)**

[62]

*Discussant*

Honorato, Vinicius [66] see Rocha, Bruna

**Hoopes, John (University of Kansas), Geoffrey McCafferty (University of Calgary) and Sharisse McCafferty (University of Calgary)**

[132]

*Out of Mexico: An Archaeological Evaluation of the Migration Legends of Greater Nicoya*

Ethnohistoric documents pertaining to the Greater Nicoya archaeological subarea document legends in which the inhabitants of western Nicaragua and northwestern Costa Rica traced their ancestry to migrations from the north, presumably in Mexico. Linguistic data indicate that speakers of Chorotega, an Oto-Manguean language, and Nicarao, an Uto-Aztecan language—both apparently intrusive into a region dominated by speakers of Misumalpan and Chibchan speakers—were present in Greater Nicoya in the sixteenth century. Archaeologists and art historians have long noted that polychrome ceramic vessels dating to the centuries prior to the arrival the Spanish also suggested a strong but to date a still poorly defined “Mesoamerican influence” characterized by design layout, specific motifs, and iconographic elements such as feathered serpents that resemble those of specific parts of Mesoamerica. This paper critically examines these migration legends in the context of over two decades of systematic archaeological research. We evaluate the successes and failures of a search for specific ethnic identities representing long-distance, north-to-south migrations in the archaeological record and offer an informed explanation for the existence of these migration legends in the oral history of Greater Nicoya.

**Hoopes, John (University of Kansas)****[178]***Discussant***Hopwood, Marie (Vancouver Island University)****[62]***Teaching with Beer: An Archaeology of Beer in and outside of the Classroom*

Why study an archaeology of beer? Beyond the modern popularity of craft beer, this beverage is a deeply ancient and meaningful form of material culture. It is also a powerful tool to put faces onto the past, and to make the ancient peoples we study both relevant and enticing to our students and the larger public. Through my Raise Your Glass to the Past experimental archaeology project, community members from central Vancouver Island, BC, experience ancient-inspired ales combined with information about the associated cultures in a way not experienced by these audiences before. Aside from drinking the beer, the Raise Your Glass to the Past project shares archaeological knowledge through interpretations of taste, daily practices, and ways of knowing. It has long been shown that the cultural construction of taste is embedded with meaning and references both identity and place. Evidence of the daily practices of ancient life can highlight ways of production, gender roles, and habitus. Lastly, the ways of knowing about the science of fermentation, as well as relationships structured around drinking, allows for a unique viewpoint into the lives of past peoples, putting faces onto the past and making their humanity more real to nonacademic audiences.

**[62]***Chair*

Horan, Robert [68] see Napora, Katharine

**Horn, Sherman (Exploring Solutions Past) and Anabel Ford (University of California, Santa Barbara)****[23]**

*Terraces, Quarries, and Berms, Oh My! Evaluating Land Use and Landscape Modification at the Ancient Maya City El Pilar*  
Ongoing research at El Pilar—an ancient Maya city located along the Belize/Guatemala frontier—has documented hundreds of landscape-modification features in the area surrounding the monumental civic center. The complexity and variety of these features, which include terraces, berms, quarries, check-dams, and *aguadas*, indicate the sophistication of Maya environmental manipulation and reveal potential aspects of socioeconomic organization within the city. Our full-coverage survey at El Pilar, guided by high-resolution lidar imagery of the area surrounding the city center, permits a broad-based inquiry into human-environment interactions in the tropical Maya Forest. This poster presents updated survey results from the 2019 field season and preliminary spatial analyses of cultural remains. We explore the distribution of landscape modification features and examine relationships between these features, settlement patterns, and topography to investigate land-use strategies around a major Classic Maya center.

**Horn, Sherman (Exploring Solutions Past)****[56]***Discussant*

Horn, Sherman [71] see Tran, Justin

**Horowitz, Rachel (Washington State University)****[136]***Chair***Horowitz, Rachel (Washington State University), Marcello Canuto (Tulane University) and Tomas Barrientos (Universidad del Valle de Guatemala)****[181]***Production in Urban Spaces: Lithic Production and Economic Organization at La Corona, Guatemala*

Studies of urban spaces have often relied on specialized production as a marker of urbanism. More recently, our understandings of production activities in urban environments have been used to understand the variety of activities that occurred within these spaces and the ways in which they reflect the structure of the urban environment, particularly their economic organization. This paper will focus on lithic economies as a lens through which to examine the economic variability in urban, peri-urban, and rural spaces. We use a case study from the central Maya lowlands, La Corona, Guatemala, to address these issues. More than 10 years of excavations at La Corona have explored areas in the urban, peri-urban, and surrounding rural region, providing a rich collection of lithic materials with which to evaluate the production, use, and distribution of lithics throughout these spaces. Analysis of manufacturing locations, scale of production and use, and acquisition of lithic raw materials can provide an understanding of the role of lithics in the economic organization of La Corona. This lithic analysis provides the opportunity to explore the economic variability and organizational differences throughout La Corona.

Horowitz, Rachel [61] see Brown, M. Kathryn

Horowitz, Rachel [136] see Cap, Bernadette

Horta, Luis [6] see Belardi, Juan

**Horta, Pedro (ICArEB, Universidade do Algarve), João Cascalheira (ICArEB, Universidade do Algarve) and Nuno Bicho (ICArEB, Universidade do Algarve)**

**[21]**

*Lithic Adaptive Strategies of Early Modern Humans in Southwestern Iberia: New Data from Vale Boi's Layer 7 and 8*

The arrival of modern humans in Iberia is a continuously debated topic, especially when it comes to its southernmost regions due to the evidence of late Neanderthal occupations. In Southwestern Iberia, there is evidence for the presence of both groups in the late Pleistocene. Although the exact moment of replacement is still unclear due to the lack of absolute dating in most sites. In order to better understand this replacement it is imperative to understand the adaptive strategies of both groups just prior and after the arrival of modern humans. For this poster we present new data on the lithic reduction strategies from the recently excavated layers 7 and 8 from the Upper Paleolithic site of Vale Boi. This occupation currently comprises the earliest modern human occupation in the region. Our results show that modern humans at the site were strategically exploring local raw materials through a mix of free-hand and bipolar reduction. In addition, scaled pieces were used as wedges for working hard organic materials. This combination of techniques provided a safe adaptive strategy for maximizing the resources available to these groups.

**Hosek, Lauren (University of Colorado, Boulder) and Katelyn Bajorek (Syracuse University)**

**[20]**

*Worn Down: Dental Attrition and Dietary Differences at an Early Medieval Settlement in Central Europe*

Medieval diets may have differed in preparation rather than composition, with certain classes, genders, or age groups eating more abrasive and/or more cariogenic preparations of the same foods (Beranová 2007; Esclassan et al. 2015). This study is a bioarchaeological examination of dental attrition at the ninth–eleventh-century site complex of Libice nad Cidlinou in what is now the Czech Republic. The dental remains of 115 adults from two contemporaneous cemeteries were examined for masticatory and non-masticatory wear. Despite traditionally recognized status differences between the mortuary contexts of these two cemeteries, few statistically significant differences in dental wear were found between the two cemetery samples. However, for all adult age categories at both cemeteries, males were more likely to exhibit moderate to severe dental attrition than females. This finding suggests that, in general, men were consuming a more abrasive diet than women, regardless of burial location. This project also integrates skeletal data with archaeological and historical sources to offer insight into how dental health is informed by social factors, including status, gender, and religious identity. As such, this work has implications for our understanding of early medieval diets as well as how certain religious practices might be accessed bioarchaeologically.

**Houk, Brett (Texas Tech University)**

**[56]**

*Discussant*

Houle, Jean-Luc [93] see Égüez, Natalia

Hovezak, Timothy [26] see Field, Sean

**Howe, David**

**[73]**

*Discussant*

Howe, Ellen [133] see DeLeonardis, Lisa

**Howe, Mark (US State Department - USIBWC) and Nancy Gonzalez (Independent Academic)**

**[65]**

*W. T. Millington and the Mexican Revolution: The Search for Battle Sites and Camps*

The Millington letters from 1910 to 1913 described military actions along the Rio Grande in Presidio, Texas, at the start of the Mexican Revolution (1910–1920). These letters are handwritten accounts of the Mexican Revolution and what was occurring across the US–Mexico international border and how this unfolded in the Big Bend region. This presentation will examine what happened in this area and the battles across the river in Mexico between the “insurrectors” and Mexican soldiers. We will review what has been found archaeologically on the United States side and explorations in Mexico. In all, by examining new information along the border and how the International Boundary Commission (IBC) under Consulting Engineer W. W. Follett was involved, we can understand a little more of this time in history. Examination of Follett’s activities and Millington’s letters show how both played large but unknown roles in history, especially in the Big Bend region.

**[65]**

*Chair*

Howell, Angelina [8] see Dewan, Eve

**Howell, Mark (Winterville Mounds, Mississippi Department of Archives and History)****[84]***A Native American Music Replication Project: An Ethno-archaeomusicological Perspective*

This paper chronicles an instrument replication and composition project, using archaeological materials, historic and ethnohistoric documentation, and interviews with archaeologists, music consultants, project commission personnel, craftspeople, composer, and others with a vested interest. Three instrument artifacts assigned to the Mississippian period were the impetus behind the commission. They are a cane flute, cane rasp, and gourd rattle, all of which are documented in situ from rock shelter sites in the Ozark Plateau of Arkansas. A fourth, a clay drum, is based on Mississippian iconographical evidence. The aims were to commission southeastern Native American artisans to replicate the four instruments to then be used by a Native American composer for an original composition. The composition would incorporate precolumbian music elements as derived from music archaeological and organological evidence, but would ultimately reflect the creative choices of the composer, informed by music traditions from his culture. Incorporated education outreach will inform students about music of the past: how it is discovered, interpreted, heard, described, and understood. Native American intertribal political issues and COVID-19 restrictions affecting the project are also discussed. Due to the latter, the performance premier of the composition is currently on hold.

**Howland, Matthew (UCSD Anthropology Department), Brady Liss (UCSD Anthropology Department), Mohammad Najjar (UCSD Levantine Archaeology Laboratory) and Thomas Levy (UCSD Anthropology Department)****[168]***Integrating Digital Datasets into Public Engagement through ArcGIS StoryMaps*

Archaeological research should not only be published in academic journals but also shared with the public and stakeholding communities. Ideally, the public should have opportunities to interact with cultural heritage and interpret it on their own terms. In today's digital environment, hypermedia and deep mapping are ways of increasing the accessibility of digital archaeological data. To engage the public in this way, scholars can rely on vastly improved data collection and curation technologies to aid them, including digital photography, geographic information systems (GIS), and 3D models. These technologies, even when collected for analysis or documentation, can be valuable tools for educating and involving the public with the archaeological methods and how these methods help archaeologists to learn about the past. Ultimately, academic storytelling can benefit from making archaeological results and methods accessible and engaging for stakeholders and the general public. ArcGIS StoryMaps is an effective tool for integrating digital datasets into an accessible framework that is suitable for interactive public engagement. This paper describes the benefits of using ArcGIS StoryMaps for hypermedia and deep mapping-based public engagement using the story of copper production in Iron Age Faynan, Jordan, as a case study.

Howland, Matthew [29] see Liss, Brady

Howse, Lesley [179] see Desmarais, Danii

**Hristova, Petya****[174]***Investigating Social Significance and Differentiation of Buildings through Painted and Figurative Decoration, Built-In Furnishings, and Portable Finds*

A number of sites from the Balkans and Greece dated to the fifth millennium BC, Karanovo and Dikili-Tash among others, provide evidence for a special status of built spaces. A comparative study of painted and figurative wall decoration, built-in furnishings, and portable finds in their archaeological context demonstrates that similar architectural layouts together with a presence of decorative features, a comparable form across the region, might not always correlate with a similar interpretation about the possible uses of a particular building. Sometimes built spaces designated for specialized activities are distinguishable from built spaces used for multiple activities. Emerging patterns are tentative as the relationship between tells and flat settlements is not well surmised for the presence of yet limited data. The study has implications not only for a better understanding of the sociopolitical and cultural transformations in southeast Europe during the Late Neolithic–Chalcolithic period, often viewed as a transition period, but also for designing problem-oriented archaeological surveys in the region.

**[174]**

Chair

**Hrynck, Gabriel (University of New Brunswick)****[103]***Building the Dawnland: Toward an Architectural History of Hunter-Gatherers on the Maritime Peninsula*

Architectural history relies on the idea that the human-built environment reflects and reinforces cultural ideas about how people view the world. Architecture therefore permits cultural changes to be tracked through time. Despite this, a literature review of past considerations of hunter-gatherer-built environments reveals remarkably little interest in approaching them through a lens of architectural history. Rather, a couple of contrary themes emerge: that hunter-gatherer architecture is so ephemeral that the traces it leaves on the landscape elude study and that hunter-gatherers don't really produce houses at all—they make shelters, the shapes of which are more or less dictated by environmental realities. In this paper, I begin to consider an architectural history on the Maritime Peninsula: how Wabanaki people built their homelands as an historical process, contextualizing historic accounts of Wabanaki wigwams as forms of persistence and resistance against colonialism and a way to maintain mobility and identity.

**[103]**

Chair

Hrynck, Gabriel [103] see Patton, Katherine

**Hsu, Teresa (Smithsonian Institution) and Nawa Sugiyama (University of California, Riverside)****[94]***Playing with Your Food to Feed the Masses: A Zooarchaeological Perspective at Teotihuacan, Mexico*

Animals are invariably integrated into the intricate makings of human culture, providing material evidence to reconstruct ancient urban foodways that influence and structure sociopolitical identities, practices, and ideologies. We explore the concept of production and how it relates to food acquisition and distribution, using recent zooarchaeological analysis from the Plaza of the Columns Complex (PCC) in Teotihuacan, Mexico. Teotihuacan (150 BCE–550 CE) was a precolumbian metropolis, supporting a population estimate of 100,000 individuals at its height. Without the influence of large domestic livestock, Teotihuacan differs in faunal diversity from its Old World counterparts and other regions of Mesoamerica as well. Despite varied ecosystems characterized by arid and lacustrine environments, the PCC archaeological record shows low species diversity and high concentrations of leporids and quail. This suggests these species have in some effect been cultivated, bred, and habituated in small-scale management for subsistence at a household level and beyond. This shift and adaptation could compensate for alterations in the environment as well as high density living from a growing economy. The PCC faunal assemblage exemplifies the extensive planning and preparation needed to sustain a large population and emphasizes the multiscale role animals played in transforming the consumptive strategies at Teotihuacan.

Hu, Di [156] see Chiou, Katherine

Hua, Quan [83] see Weisler, Marshall

Huang, Lushuang [72] see Rayfield, Kristen

**Huchim, José (INAH)****[82]***La documentación 3D como herramienta para el diagnóstico y la conservación en Monte Albán*

La utilización de tecnologías de punta para el tratamiento de la problemática de Conservación y la Investigación en Monte Albán ha sido tendencia desde hace al menos una década. Hoy en día, el levantamiento de imagen 3D de alta resolución, nos permite realizar los análisis de deterioros y las propuestas de intervención de restauración arquitectónica de manera puntual y oportuna. Esta ponencia trata de las metodologías empleadas para la definición del estado de conservación de los monumentos a partir de la imagen 3D; de los resultados de análisis visual que nos permite esta tecnología. Se plantean también las expectativas de trabajo digital en la conservación de Monte Albán para el futuro.

**Huckert, Chantal (Universidad Veracruzana)****[139]***The Grid Patterns in the Vestments and Headdresses of Female Statuary from the Classic Period Cultures of Central Veracruz*

Various researches report that the diamond, rhomboid, and square-gridded patterns and their stepped variants designate the surface of the earth as the fecund female progenitor, manifested in flowers, corn cobs, and sweet, nurturing waters. These patterns also designate the zoomorphic aspects of the shell or skin of the fertile earth. In the Maya codices, the mother goddesses weave gridded-patterned fabrics on their autochthonous looms, creating a primordial texture of the warp and weft crossing of the threads. From these perspectives, we shall explore the meanings of the gridded patterns in the headdresses and vestments of female statuary from Late Classic central Veracruz archaeological sources. As we identify the various gridded patterns with the depicted objects—for instance, the body of a *mazorca de maíz* and its kernels, and the pictogram that consists in a pars pro toto of this same corn cob—we shall show that these patterns are intended to be signs in a graphic system implemented in textiles, which correspond to Mesoamerican forms and conventions. The body languages of the statues, their hairdos, headdresses, and vestments will comprise datasets that will allow us to highlight the ceremonial functions associated with the female gender in Classic Veracruz.

Huerta-Chavez, Paloma Constanza [55] see Contreras-Sieck, Miguel

Huff, Meagan [183] see Wilson, Douglas

Hughes, Karissa [30] see Singleton, Robin

**Hull, Bryna (University of California, Davis), Jelmer Eerkens (University of California, Davis) and Reba Fuller (Tuolumne Me-Wuk)****[7]***Exploring Hunter-Gatherer Mobility Using Sulfur, Carbon, and Nitrogen*

$\delta^{34}\text{S}$  can be used in conjunction with  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  to examine if people were accessing resources from within the same local area or were seasonally mobile to exploit foods from other regions. Here we apply this stable isotopic triad to investigate mobility of hunter-gatherers from the central Sierra Nevada region. The  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  results demonstrate a terrestrial protein diet, low in trophic level. We hypothesize if the groups under study are consuming similar resources within the same local region, then people should exhibit similar  $\delta^{34}\text{S}$  values. We also examine possible differences between the sexes, and adults and juveniles.

**Humphreys, Stephen (Durham University), William Griswold (Northeast Archaeological Resources Program) and Steve Roskams (University of York)**

**[38]**

*An Aircraft Search and Recovery Mission in Southern England: A Case Study in Rehabilitation Archaeology*

In September 2019, American Veterans Archaeological Recovery (AVAR) served as the lead partner of the Defense POW/MIA Accounting Agency (DPAA) in the search for aircrew losses associated with a World War II-era B-24H crash in southern England. Fieldwork consisted of a site survey and bulk excavation. Over a four-week period American military veterans from AVAR worked under technical supervision provided by the National Park Service, alongside British veterans from Breaking Ground Heritage (BGH) and students and a consultant from the University of York. These international partnerships were necessary for the completion of the 2019 archaeological objective, but the integration of American veterans, British veterans, students, and archaeological professionals also added value to the mental wellness improvement component of the AVAR and BGH programs. The recovery of human remains has an inevitable emotional impact on excavators but project results suggested that with proper mental health protocols in place, this impact can be positive for veterans, for whom the DPAA mission has a unique resonance, as well as for civilians. This poster will illustrate the archaeological work completed as well as suggesting methods by which mental health measures can be integrated into this particular fieldwork environment.

Hundman, Brittany [128] see Espino Huaman, Richard

**Hunt, David (University of Washington)**

**[95]**

*Using Landscape Learning to Explore Diachronic Change within the Western Stemmed Tradition*

The Western Stemmed Tradition (WST) spanned as much as 5,000 years in the Great Basin. However, due to deflationary erosion, more refined control within this wide temporal range remains elusive. Thus, temporally sequencing WST sites, subtypes, and their diagnostic artifacts is currently difficult, often unattainable, and leaves Great Basin archaeologists with few traditional methods for constructing a WST point chronology. Without a means to date many WST sites, some of the most important questions about the human colonization of, and adaptation to, a vast expanse of the arid west have gone unanswered. To help address these problems, my research explores a new method for the chronological ordering of WST sites and for establishing a WST stemmed point chronology. This research employs models of landscape learning, which consider how human colonizers of a new land collectively acquire and share knowledge about their new environment, specifically regarding toolstone acquisition and usage, and creates new methodologies for quantifying the prominence, or discoverability, of lithic resources on the landscape. This approach should allow the detection of a continuum of landscape learning over time, a continuum that should allow WST sites to be ordered in time.

Hunter, Diane [109] see Thompson, Christine

**Hunter Burkett, Meisha (Independent Researcher), Allan Ceen (Studium Urbis), Mattia Crespi (Sapienza Università di Roma) and Augusto Mazzoni (Sapienza Università di Roma)**

**[167]**

*Acquedotto Vergine: Stewardship of Ancient Water Infrastructure in the Modern Roman Periferia*

The Acquedotto Vergine is the only ancient aqueduct still functioning in Rome. Commissioned under Emperor Augustus, and privately financed by Agrippa as part of a larger urban water infrastructure improvement program, the aqueduct was dedicated on June 9, 19 BCE and supplied water for both public structures and private concessions. Sourced from springs at the Sorgenti di Salone, and engineered as a gravity-fed, 21 km long system, the aqueduct principally consisted of subterranean, arched, brick-lined tunnels excavated into volcanic tufa. Water descended along the aqueduct's conduit at a gradual rate (19–22 cm per km) producing 158,203 m<sup>3</sup> daily. Of Rome's aqueducts, the Vergine was unique in that its linear course was punctuated by a series of "bends" so deposits could accumulate. In his treatise, *De Architectura*, Vitruvius described constructing a series of vertical shafts from the top of the channel to grade so crews could collect and remove built-up sediment. Shafts were capped at-grade with travertine markers. Two thousand years after its dedication, a multidisciplinary team conducted a cartographic investigation of the aqueduct's surviving markers. This paper presents the results of that collaboration, outlining survey challenges, preservation agency jurisdiction, and opportunities for stewardship and sustainability of this infrastructural heritage.

Huntley, Deborah [125] see Eckert, Suzanne

Hurst, Heather [59] see Rossi, Franco

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

**[126]**

*Decoding Knudson's Flintknappers: A 3D Model Analysis of the Plainview Bison Kill Projectile Points*

Excavated in the mid-1940s, the Plainview site on the Southern High Plains generated considerable interest and continues to do so today. After hours spent illustrating each flake scar of the Plainview (41HA1) bison kill site's lithic assemblage, Knudson stated in her 1973 dissertation that "perhaps only one and at the most two individuals made these tools." To further examine this observation as a hypothesis, 3D models were made using photogrammetry of the Plainview type projectile points. Twenty of the 28 Plainview projectile points Knudson examined were available for this research. The other eight had been from local collectors. Analysis of the 3D projectile point models focused on flake scar size, orientation, and overall patterning. These data then were compared with 3D

models made of Plainview projectile points from the Warnica-Wilson Plainview campsite located near Portales, New Mexico. Greater variation might be expected in a camp assemblage vs. a kill assemblage. Results suggested that 3D models have the potential to quantify the number of flintknappers responsible for projectile point manufacture. A focus on individual variation within Plainview lithic assemblages also appeared to have the potential to delineate the Plainview projectile point type better—a notorious problem for Paleoindian scholars.

**Hurt, John Duncan (University of Texas, Austin)**

**[108]**

*Social and Behavioral Implications of Architecture at the Cividade de Bagunte*

The Cividade de Bagunte is an Iron Age and Roman period hillfort, or *castro*, located in the municipality of Vila do Conde in northwestern Portugal. This paper looks at specific features of Bagunte's architectural remains in order to speculate about past social behaviors. Novel approaches to the spatial and material properties of the site's remains may allow us to understand aspects of the ancient community's construction of, perception of, and interaction with their own built environment. Toward this end, the architecture of Bagunte is interpreted as a reflection of past ways of seeing and being, and as a material dimension of fundamental significance to the daily experiences of the site's ancient inhabitants.

**Huster, Angela (Arizona State University)**

**[177]**

*Ceramic Chronology in the Absence of a Horizon*

In this paper, I present an initial ceramic seriation for the Epiclassic site of Chicoloapan Viejo, in the southern Basin of Mexico, with a discussion of issues particular to periods of political fragmentation. I demonstrate that two phases can be distinguished at Chicoloapan Viejo, based on relative type frequencies, rather than the presence or absence of diagnostic markers. As one of only a handful of Epiclassic chronologies based on well-excavated data and anchored by radiocarbon dates, this seriation has the potential to clarify the dynamics of regional interaction during Teotihuacan's collapse and aftermath. One of the primary challenges in studying periods of political fragmentation can be the establishment of basic chronological periods in cases where political fragmentation has resulted in high levels of regional diversity, resulting in either a lack of diagnostic marker types, or high levels of variation in the frequencies and dates of use of a type within a relatively limited area. However, if overcome with detailed, site-level chronologies, such periods of fragmentation offer unique opportunities to examine the very social processes that produced them.

Huster, Angela [101] see Blumenfeld, Dean

Huster, Angela [177] see Morehart, Christopher

**Hutson, Scott (University of Kentucky)**

**[104]**

*Ancient Demography in Northwest Yucatán, Mexico*

Research in northwest Yucatán, Mexico, has played a large role in the development of demographic archaeology in the Maya area, beginning with Edward Thompson's nineteenth-century investigations of housemounds at Labna and reaching a mid-twentieth-century pinnacle with maps of Mayapan and Dzibilchaltun. In the twenty-first century, advances have continued in Classic and Postclassic period demography in both the Puuc and the Plains, along with surprising revelations about the Preclassic. This paper focuses on mapping and excavation conducted by the author in Preclassic contexts in the Ucí area and Classic contexts at Chunchucmil. The paper also reviews new data from Puuc sites such as Kabah, Xocnaceh, Muluchtzekel, Paso de Macho, and Yaxhom and from Northern Plains sites such as Poxilá, Xtobo, Izamal, Mayapan, and Aké.

**Hutson, Scott (University of Kentucky)**

**[181]**

*Discussant*

Hylton, Lindon [8] see Dewan, Eve

**Iannone, Gyles (Trent University)**

**[150]**

*Searching for Bagan's Peri-Urban Neighborhoods: Some Initial Results*

The IRAW@Bagan project is aimed at generating an integrated socioecological history for residential patterning, agricultural practices, and water management at the Classical Burmese (Bama) capital of Bagan, Myanmar (eleventh to fourteenth centuries CE) across a range of significant ecological, climatic, economic, sociopolitical, and religious changes. This objective is being achieved through a settlement archaeology study within the peri-urban (mixed urban-rural) settlement zone immediately surrounding Bagan's walled and moated, regal-ritual *shwei myo taw*, or epicenter. This discussion presents the results of the initial test excavations at the Shwe Creek and Otein Taung residential sites, with emphasis on the nature of occupation surfaces and the character of associated features, artifacts, and ecofacts.

Iannone, Gyles [150] see Macrae, Scott

Ibarra Narvaez, Thania [119] see Shaw, Justine

**Ichikawa, Akira (University of Colorado, Boulder)****[89]***Open and Restricted Plaza of San Andres in the Zapotitan Valley, El Salvador*

Plazas are important spaces for the ancient Mesoamerican daily life. Despite the fact that this perception is shared among many scholars, in the Southeastern Maya area, especially in El Salvador, the study of the plaza is limited. This paper focuses on San Andres, which was ceremonial center in the Zapotitan valley during the Late Classic period and has been identified with two plazas in the main architectural group; open and restricted plazas. Based on the new excavations and radiocarbon data from San Andres, this paper examines when and how these plazas were formed in San Andres and interprets their social implications. Both plazas were constructed simultaneously after 650 cal AD, but with different techniques and purposes. The open plaza was covered by mud plaster and surrounded by four possible elite residential houses, with easy access from outside of plaza; that is, it probably functioned as gathering place. In contrast, the plaza with restricted access was constructed as part of an Acropolis with tons of adobes and invisible from outside of the Acropolis. There is rich ritual evidence in this plaza, indicating that the restricted plaza was used for exclusive elite ritual.

**[89]**

Chair

**Iglesias, Christina (California State University, Los Angeles)****[158]***Interpreting a Subterranean Feature at Chichen Itza*

During the 2019 season, a subterranean feature was excavated atop a pyramidal structure in the pueblo of San Felipe Nuevo, 839 m northeast of the El Castillo pyramid at Chichen Itza. The entrance is a round, finely finished, chultun-like entrance 53 cm in diameter. The walls are plastered, which suggests its function as a water cistern, but the plaster is a mere 0.5–1.0 cm thick, which is certainly too thin to prevent leakage. Additionally, the feature measures only 84 cm from floor to ceiling, which makes it anomalous for a chultun. The feature was constructed in fill so it is also not a *sascabera*, which may have a similar entrance. Its placement at the very top of a large platform provides the best clue to its function.

**Iizuka, Fumie (University of California, Merced), Jeffrey Ferguson (University of Missouri) and Masami Izuho (Tokyo Metropolitan University)****[171]***Geochemical Provenance Analysis of Pre-Younger Dryas Pottery from Southern Japan Using Neutron Activation*

Due to the availability of detailed tephrochronology, southern Kyushu of southern Japan, has among the most reliable dates for pottery from the late Pleistocene in East and Northeast Asia. Pottery from the Incipient Jomon period is found below Satsuma Tephra dated to ca. 12,800 cal BP. In our previous study, we conducted petrographic and microprobe analysis of Incipient Jomon sherd samples from the Sankakuyama I site on Tanegashima, an island off the coast of southern mainland Kyushu. The result suggest that most samples were locally produced and some samples were transported from the mainland Kyushu and/or Yakushima Island. We interpreted that people were mainly sedentary in an ecotone with varied resources, but to buffer occasional and long-term risks, engaged in exchange with non-community members on other islands. In this study, we conducted geochemical sourcing with neutron activation analysis (NAA). Our results from NAA and behavioral interpretations agreed with our previous results.

**Ikehara Tsukayama, Hugo (Metropolitan Museum of Art, NY)****[159]**

Discussant

**Ikeshoji-Orlati, Veronica****[70]***From Villanovan to Etruscan Mortuary Goods: The Ceramic Assemblages of Four Seventh-Century BCE Pit Graves from the Site of San Giuliano*

The San Giuliano necropolis, located within the Marturanum Regional Park in northern Lazio, Italy, is well-known for its hundreds of Villanovan and Etruscan graves. As part of our mission to understand the patterns of human habitation at the site from the ninth century BCE through the thirteenth century CE, the San Giuliano Archaeological Research Project (SGARP) has excavated a selection of the Etruscan rock-cut chamber tombs and Villanovan *tombe a fossa* (pit graves) over the past four field seasons. This presentation focuses on the material evidence from four late Villanovan *tombe a fossa* located on the San Simone plateau within the San Giuliano necropolis. Dating to the early seventh century BCE, the San Simone tombs are inhumation graves of three adults and one child with rich assemblages of ceramic, bronze, and amber goods. Analysis of the material remains reveals the transitional late Villanovan to early Etruscan nature of these tombs; in conjunction with the physical proximity and orientation of the four graves, it raises further questions about the social status and possible kinship relationships between the deceased.

**Ingalls, Victoria (University of Texas, San Antonio)****[61]***Ritual and Movement in the Preclassic Hinterlands of the Mopan River Valley*

Evidence from the Mopan River valley continues to clarify the nature and extent of Preclassic occupation of the region. The hinterland community of San Lorenzo sits directly across the river from both Xunantunich and Actuncan, sites with substantial Preclassic construction and ritual use. Using data gathered from this ancient community, this paper focuses on the role of focal nodes within a wider landscape, analyzing the potential for movement and interactions across the built and natural environments.



While not monumental in scale, San Lorenzo boasts several Preclassic structures, including a round ritual structure that was likely used for gatherings of the local community. Numerous analogous structures are documented across the lowlands and seem to be most commonly found at or near sites that also include a Preclassic E Group. This paper explores the role of outlying communities in the construction and use of monumental spaces and conceptualizes how movement at different scales may shape community identity and social memory through the creation of space/place.

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

[50]

*Discussant*

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

[97]

*Poor Preservation in Complex Urban Settings: Chronology-Building in the Maya Area*

Archaeologists working in the Maya area face multiple challenges as they develop chronological studies. First, many sites are complex urban centers with diverse types of structures and areas. Second, these sites commonly have long occupation, involving migrations, destructions of buildings, and recycling of construction materials. Third, in this tropical environment, the preservation of organic materials is poor. To build reliable chronologies under these conditions, researchers need to have substantial data from excavation and a sufficient number of radiocarbon dates combined with ceramics studies and stratigraphic information. A particularly important issue is the identification of problematic old radiocarbon dates resulting from stratigraphic mixing. The Bayesian analysis of radiocarbon dates provides an effective tool in this process.

Inomata, Takeshi [119] see Beach, Timothy

Iovita, Radu [100] see Coco, Emily

Irwin, Jessica [49] see Nicholson, Christopher

**Ito, Nobuyuki (Nagoya University)**

[47]

*Un fragmento de estela con la fecha de Bak'tun 7 en Chalchuapa, El Salvador*

En la Costa Sur de Mesoamérica, se han descubierto numerosas estelas esculpidas. Sin embargo, solamente una docena de estas se registró dentro de un contexto arqueológico del período Preclásico. No obstante, en esta región se localizan dos sitios que poseen estelas con las fechas calendáricas más tempranas del Bak'tun 7, como Chiapa de Corzo y El Baúl, mientras que hacia el norte de esta región, solo existe un sitio, como Tres Zapotes en Golfo de México. En El Trapiche, Chalchuapa, se han encontrado varios fragmentos de estela al frente del Montículo E3-1, los cuales se colocaron como ofrenda al frente del acceso a la misma Estructura. Al sur de la Estructura E3-1 y frente a la Estructura E3-2, se descubrió otro fragmento de estela cuya fecha pertenecía a la cuenta larga del calendario relacionada al Bak'tun 7, este hallazgo se dio durante la 6ª Temporada de Campo del Proyecto Arqueológico de El Trapiche (2018). En esta ponencia se presentará la evidencia arqueológica en el área de El Trapiche, Chalchuapa, que muestra la presencia de una fecha muy temprana del calendario de cuenta larga maya en El Salvador y su relación con Mesoamérica.

**Ives, John (University of Alberta)**

[126]

*A Canadian Perspective on Later Paleoindian Technocomplexes and Emerging Genetic Data*

Ruthann Knudson had an abiding interest in the later Paleoindian world and an affinity for Canadian research, keeping in regular touch with colleagues across the 49th parallel. Geneticists consistently identify three clades in the early prehistory of the New World: an ancient Beringian population in Alaska, and early northern and southern clades south of the ice masses. The northern clade contained ancestors of the Haida, Tlingit, Tsmishian, Athapaskans, Algonquians, and Salish. Early Holocene language identities are essentially beyond the range of the comparative method in historical linguistics, yet this northern clade would eventually yield the northern speech communities of the later Holocene. While it would be folly to think that it would be a simple matter to correlate technocomplexes of the later Paleoindian world with language identities, it is worth asking just which technocomplexes and social behaviors might have been involved in this time range. Eastern Beringian populations and people from south of the ice masses came into contact with each other by the fluted point era; emerging genetic perspectives should serve to sharpen our interest in subsequent Cody Complex and northern Plano manifestations, as well as intriguing toolstone distributions from this early Holocene timeframe.

**Ivins, Erica, Colin Quinn (Hamilton College), Horia Ciugudean (Muzeul National al Unirii-Alba Iulia), Gabriel Balan (Muzeul National al Unirii-Alba Iulia) and Lacey Carpenter (Hamilton College)**

[4]

*Active Forgetting: Cemetery Abandonment and Mortuary Politics in Bronze Age Transylvania*

The abandonment of mortuary spaces is an intentional social process. As a political act, the choice to abandon a cemetery is a moment in which communities manipulate memory. Most mortuary studies, however, often overlook the social processes that led to cemetery abandonment. This poster presents the results of Bayesian analyses of radiocarbon dates from multiple mortuary sites in southwestern Transylvania during the Early and Middle Bronze Age (2700–1500 BCE), a period of transformation in the degree of

socioeconomic inequality. We evaluate the chronological models against theoretical models of the social contexts and consequences of abandonment. Our results demonstrate how analyzing the materialization of memory in mortuary spaces allows archaeologists to interpret sociopolitical organization.

**Izquierdo, Ana Luisa and Virginia Arieta Baizabal**

[119]

*Nueva hipótesis en torno a la organización política olmeca de San Lorenzo*

Hay cierto acuerdo entre los arqueólogos que los olmecas integraron verdaderos estados. Aunque se sostiene que eran sistemas centralizados, la naturaleza política de esta organización permanece todavía poco clara, así como sus mecanismos de funcionamiento. Por ahora, los significativos avances en el conocimiento de la más antigua capital olmeca, San Lorenzo, originan dudas al respecto. Éstas surgen principalmente del estudio demográfico del PASLT y los mapas que muestran la distribución arquitectónica y poblacional, donde se observan grupos residenciales que invitan a pensar en la existencia de unidades corporativas como las pensó Julia Hendon para Copán o "casas" y personas morales como Susan Gillespie lo planteó para los mayas. Por otro lado, los modelos teóricos sobre los estados tempranos o arcaicos, postulan el parentesco como el eje central de ellos, por lo que las unidades residenciales detectadas en las numerosas pruebas de barreno, dan la base empírica que enriquece la discusión en torno a un estado no del todo centralizado, sino una convivencia de unidades corporativas con una cierta autonomía ligadas a la autoridad central.

Izuho, Masami [171] see Iizuka, Fumie

**Izzo, Victoria (Texas A&M University), John Walden (University of Pittsburgh), Olivia Ellis (University of Arizona), Kirsten Green Mink (University of Montana) and Jaime Awe (Northern Arizona University)**

[67]

*Identifying Patterned Variability in Preclassic–Postclassic Maya Mortuary Practices in the Belize River Valley*

[WITHDRAWN]

Izzo, Victoria [23] see Ellis, Olivia

Izzo, Victoria [152] see Walden, John

Jacobs, Craig [68] see Napora, Katharine

**Jalbert, Catherine (Texas Historical Commission) and Laura Heath-Stout (Emory University)**

[144]

*A Study of Methods and Demographics in National Science Foundation Archaeology Grants, 2013–2020*

Since Gero's (1985) seminal article on gender inequities in archaeology, feminist archaeologists have theorized that different research processes in the discipline are gendered: fieldwork is masculine-coded and lab and museum work is feminine-coded. Based on research conducted by the SAA Task Force on Gender Disparities in Archaeological Grant Submission, Goldstein and colleagues (2018) revealed that while more men submit grant applications to the National Science Foundation (NSF) overall, both men and women submit more post-PhD proposals for field-based than for lab-based projects. They conclude that the disparity between project types (field-based vs. lab-based) likely results from many factors, which could include the long-held (mis)perception that archaeology (especially that funded by the NSF) is predominantly a masculine-coded field-based pursuit. This, in turn, might lead fewer women to apply to this funding source. This paper seeks to expand on these data by presenting an analysis of NSF-funded project abstracts (2013–2020) that focuses on (1) the types of methods employed, (2) the primary regions where research is conducted, and (3) the genders and organizational affiliations of principal investigators. These data will then be used to determine whether correlations can be drawn between these metrics and gender.

[144]

Chair

**Jalbert, Catherine (Texas Historical Commission)**

[190]

Discussant

**James, L. Brock (University of Utah Archaeological Center), Kaley Joyce (University of Utah Archaeological Center), Kate Magargal (University of Utah Archaeological Center) and Brian Coddington (University of Utah Archaeological Center)**

[54]

*A Stone in the Hand Is Worth How Many in the Bush? Applying the Marginal Value Theorem to Understand Optimal Toolstone Transportation, Processing, and Discard Decisions*

Obtaining and transporting material for manufacturing flaked stone tools comes at a cost. Numerous studies evaluate how processing may reduce transport costs, often using theory from optimal foraging theory such as central place foraging and field processing models. However, to date these studies do not adequately address the continued reuse of toolstone through space and time, or the repeated use of toolstone by multiple individuals. To remedy this, we offer a novel application of the marginal value theorem to explain changes in lithic acquisition and conveyance in terms of changing environmental context. Specifically, this study examines the impact of distance from a primary lithic source on access to secondary sources of lithic material, including previously discarded tools and cores, and quantifies these spatial patterns in terms of optimal processing before discard. We evaluate the

strengths and weaknesses of various modeling approaches, and develop and test predictions from the marginal value theorem through an artifact inventory and analysis of archaeological sites in the lower Dolores River canyon lands in southeastern Utah. This novel theoretical framework offers some general insights that are capable of explaining variation in the distribution of lithic artifacts across diverse archaeological contexts.

**James, Steven (California State University, Fullerton)**

[153]

*Two Pioneering California Women Archaeologists, 1940s–1960s: Agnes Bierman Babcock and Freddie Curtis*

Although this may seem surprising, there were very few women California archaeologists prior to the 1940s. This presentation discusses the lives of two pioneering women archaeologists who worked primarily in Southern California from the late 1940s to the 1960s, that of Agnes Bierman Babcock (1923–2018) and Freddie Curtis (1913–1996). These two women, who are generally not well-known today, each conducted some of the first archaeological investigations at coastal and desert sites in the region. The lives of these women and their contributions to archaeology are discussed as part of this session celebrating early women archaeologists.

**Jamison, Gregg (University of Wisconsin, Milwaukee), William Belcher (University of Nebraska, Lincoln), Charles Konsitzke (University of Wisconsin, Madison), Brett Hoffman (University of Wisconsin, Oshkosh) and Ella Axelrod (University of Nebraska, Lincoln)**

[38]

*UW MIA Recovery and Identification Project: A Multidisciplinary Approach to DPAA Partner Missions*

Since 2014, the University of Wisconsin Missing In Action Recovery and Identification Project (UW MIA Recovery and Identification Project) has partnered with the Defense POW/MIA Accounting Agency (DPAA) to help recover, identify, and repatriate the remains of missing armed services personnel. Our approach is innovative and multidisciplinary, providing students with practical, hands-on experiences with archaeological and forensic field methods, historical research, and data analysis. The UW MIA Recovery and Identification Project represents the earliest and among the most successful academic partnerships with DPAA, and our efforts have helped recover, identify, and repatriate the remains of three fallen heroes from World War II. We continue to expand and grow the project and its goals, including archival research and database management on missing personnel from Wisconsin. This presentation highlights our successes and future goals to assist the DPAA in providing the fullest possible accounting of our missing armed services personnel, to their families and our nation.

Janes, Madison [70] see Grimes, Vaughan

**Janes, Stephen**

[47]

*Results from Ground Surveys in the Southern San Juan Basin and the Identification of Additional Chacoan Regional Roads*

Several ongoing large-scale ground surveys in the southern San Juan Basin suggest that previously unmapped Chacoan roads may cross from Chaco Wash to Lobo Mesa. In addition to the South Road three more roads have been identified. One road extends from Chaco Canyon through South Gap and an additional 40 km southwest to the Dalton Pass great house community. The second road is approximately 30 km long and connects the Kin Bineola and Standing Rock great house communities. The third is the Kin Hochoi East Road which is now thought to extend to the northeast from the Kin Hochoi community 55 km to the Peach Springs community. These long regional roads are defined by the alignment of numerous large and small architectural sites and long linear sherd scatters. The Kin Bineola to Standing Rock Road does not lead directly to the great houses and recently collected data suggests that it is considerably longer. In addition, it does not enter Chaco Canyon. A hypothetical projection of the Kin Hochoi East Road also indicates it would not enter Chaco Canyon. These roads and other east to west oriented roads indicate that roads to Chaco may be limited to those already known.

**Janz, Lisa (Trent University)**

[93]

*Tamsagbulag: New Center of Cattle Domestication in East Asia?*

Tamsagbulag, in the far eastern steppe, is the only known example of high-density site occupation in Mongolia that predates the Iron Age. Based on the frequency and treatment of cattle remains, mid-twentieth-century excavators interpreted Tamsagbulag as an agropastoralist community. New excavations in 2018 revealed several hundred years of multiseason occupation dating through 8500–7000 cal BP—more than 2,000 years prior to the introduction of domesticated cattle. Here, I contextualize potential evidence for aurochs management in East Asia, briefly summarize findings from our 2018 excavations, and present preliminary zooarchaeological data as it relates to local resource management.

Janz, Lisa [93] see Dashzeveg, Bukhchuluun

Janzen, Anneke [96] see Green, Jennifer

Jarman, Nicholas [35] see Bergman, Stephanie

Jazwa, Christopher [27] see Bradley, Erica

Jenkins, Jessica [163] see Gallivan, Martin

**Jenks, Kelly (New Mexico State University)**

**[184]**

*Investigating Parajes: An Exploration of "Camping" Sites on the Camino Real*

For three centuries, El Camino Real de Tierra Adentro National Historic Trail served as the main wagon road transporting people and merchandise between the New Mexico colony and the interior of New Spain. Most archaeological investigations of this trail have focused on only two types of sites: actual trail segments, and associated camping areas known as "*parajes*." Knowledge of these *paraje* sites comes mostly from Spanish colonial- and Mexican-period travel accounts, which name and briefly describe several camping areas regularly used by travelers in the long stretches between colonial settlements. Reconnaissance surveys along the trail have revealed a more complicated pattern of trail-related activity, however, with numerous sites that vary in scale, content, and date. This paper investigates the concept of *parajes* and presents a more nuanced way of thinking about the types of sites associated with travel.

**Jennings, Justin (Royal Ontario Museum), Matthew Biwer (Ohio State University) and Christina Conlee (Texas State University)**

**[45]**

*Wari and the Southern Peruvian Coast: A Reevaluation*

The coast of southern Peru from the Nasca to Moquegua has played a pivotal role in distinct interpretation of the Wari polity. A hard imperial frontier, for example, ran through the region in 1960s models. Nasca and Moquegua were home to important administrative centers in the "mosaic of control" models of the 1990s. Arequipa was used to emphasize indirect control and influence in 2000s models that questioned imperial reach. These and other models have been useful for understanding the nature of the Wari state, but they often rely on only a few data points to build their case. Extensive research on the southern Peruvian coast and surrounding highlands has occurred over the last 20 years. These data, for the most part, have not yet been assembled and synthesized, limiting our understanding of Wari's footprint across this broad region. This paper synthesizes the southern Peruvian coast data, and in so doing forces a further reevaluation of Wari political economy that, among other insights, emphasizes the role of preexisting pathways, alliances, ideologies, and non-state actors.

**Jennings, Justin (Royal Ontario Museum)**

**[62]**

*Discussant*

**Jennings, Thomas (University of Louisville), Ashley Smallwood (University of Louisville) and Heather Smith (Texas State University)**

**[74]**

*Investigating the Morphological Variation of Endthinning Scars on Paleoindian Bifacial Projectile Point Morphologies Using Geometric Morphometrics*

Endthinning, the removal of longitudinal flakes from the base of a biface, is a key diagnostic flaking characteristic of Clovis, Gainey, Folsom, Cumberland, and other Early and Middle Paleoindian biface and projectile point technologies. In the Late Paleoindian Dalton tradition in the eastern United States, endthinning occurs less consistently on points and is less frequently used by researchers as a core diagnostic characteristic of Dalton bifacial technology. Recent advancements in geometric morphometric analyses offer new methods to help understand the functional implications of endthinning and its impact on point morphology. In this paper, we briefly review approaches to studying variation in endthinning. We then apply geometric morphometrics to a sample of points from the Dalton Heartland to characterize aspects of Dalton point technology and morphology.

**Jensen, Anne (University of Alaska Fairbanks/Bryn Mawr College)**

**[35]**

*Vulnerability and Values: Things to Consider for Site Prioritization*

Archaeological sites are threatened in various ways by accelerating environmental change. The scale and urgency of the threat requires new models for funding, education and recruitment of staff, engagement with the public, and long-term curation of rescued samples. One critical issue is how to prioritize sites for recording or salvage, since we cannot save them all, or even come close. To be able to use limited resources for the maximum benefit of all stakeholders, a broadly applicable transparent prioritization scheme is highly desirable. This poster focuses on what sorts of things should be considered in prioritization to achieve this goal.

**Jensen, Anne (University of Alaska Fairbanks/Bryn Mawr College)**

**[113]**

*Moderator*

**Jepsen, Jacob (Brigham Young University)**

**[54]**

*Testing Multiple Geophysical Methods at Fremont Archaeological Sites*

The ephemeral nature of many Fremont habitation sites has made site identification extremely difficult for Fremont archaeologists today. Unlike the standing and partially exposed ruins of their ancestral Puebloan neighbors, the Fremont left little evidence of their

habitation across the region. Those that remain include structures now buried below the modern-day surface. The application of geophysical techniques at archaeological sites throughout the world has proven to be an effective means of subsurface archaeological survey. Although geophysical technologies are by no means new, they have been repeatedly applied to regions throughout North America. However, these methods have been underutilized within the realm of Fremont archaeology. This paper reports on the employment of multiple geophysical methods, namely, ground-penetrating radar (GPR) and fluxgate gradiometer surveys at three known Fremont habitation sites in the Southern Utah Valley. Including the subsequent auger and shovel pit testing that occurred at Wolf Village, Wolf Mound, and Snow Farm sites, the preliminary geophysical surveys and later ground-truthing of various geophysical anomalies revealed the effectiveness of these methods in indicating where other architectural or cultural remains existed just below the surface.

Jeske, Robert [105] see Edwards, Richard

**Jijon, Juan**  
[149]

*Lidar Application in the Cerros Hojas-Jaboncillo, Manabí, Ecuador*

Currently, precise and high-resolution lidar (light detection and ranging) data is increasingly important for the detection of archaeological settlements. Through this technology it has been possible to detect a series of landscape modifications in the Hojas-Jaboncillo massif that could be of prehispanic origin. During the field verification phase it was confirmed that the area detected thanks to the lidar corresponds to an important prehispanic monumental area of Manteña cultural affiliation (AD 800–1530), where both structures, monumental platforms, monoliths, terraces, and even a Seat of Power were found. Thanks to this revolutionary technological tool, the perspectives of study and conservation of the archaeological areas of these hills of the central Ecuadorian coast are highly dynamic. This technology also allows the verification of the progress of quarry companies of stone material that are exploiting the Hojas-Jaboncillo massif and therefore prospects for heritage management are increasingly effective.

**Jiménez González, Rocío (INAH)**  
[50]

*Las figurillas cerámicas de Xalla, Teotihuacan*

Las figurillas cerámicas que muestran una gran diversidad de apariencias son testimonios silentes pero tangibles de las maniobras culturales de antaño. Podríamos decir que son un repositorio de memoria. En ellas se expresan ideas convencionalizadas durante un tiempo específico, lo que las vuelve un medio para estudiar la sociedad que las creó. El estudio de los rasgos corporales, los tocados, los peinados, los atuendos, los tratamientos a los que fueron sometidas, así como el contexto en el que fueron depositadas, nos ayuda a identificar normas sociales y diferentes prácticas cotidianas. En este trabajo se analiza la presencia de diferentes tipos de figurillas cerámicas y su relación con las variadas formas de depositación en Xalla. Se identificarán las permanencias y los cambios impresos en estos materiales durante las fases Tzacualli, Tlamimilolpa y Xolalpan, con la finalidad de distinguir dinámicas de cambio y transformación social, intentando a la par, definir el uso/función de las figurillas en este conjunto palaciego, a partir del depósito en el que fueron colocadas y por el tipo de tratamiento al que fueron sometidas.

**Jiménez Osorio, Liana (Universidad Nacional Autónoma de México / Instituto de Investigaciones Estéticas) and Emmanuel Posselt Santoyo**

[155]

*La gran línea de vida: Una arqueología alternativa para el contexto de los Pueblos Indígenas*

En esta ponencia presentaremos "la Gran Línea de Vida", una propuesta teórica-metodológica desde la Arqueología que toma como punto de partida los vínculos culturales entre el presente y el pasado precolonial de los Pueblos Indígenas en México. Esta propuesta fue desarrollada en el contexto de Nuu Savi (La Mixteca Alta de Oaxaca) y bajo un enfoque postcolonial, multivocal y relacional, permitiendo ofrecer un discurso distinto al manejado desde el evolucionismo, siendo éste dominante en los estudios arqueológicos de esta región. Desde esta perspectiva, señalamos cinco valores que consideramos que condicionan la práctica arqueológica y que delimitan las interpretaciones sobre los contextos arqueológicos. Estos valores se han incorporado en la línea cronológica y la distinguen como: evolutiva, fragmentada, unidireccional, finalizada en 1521 y desconectada del presente. Una alternativa a esta problemática es la Gran Línea de Vida, que es una línea que habla del tiempo a partir de la vida misma y que: expresa cambios y continuidades, es continua, es decir, no está fragmentada ni termina en 1521, está en movimiento y fluye en dos direcciones, está ocurriendo y dando forma al paisaje. Asimismo, esta línea retoma los conocimientos y percepciones de los mixtecos contemporáneos para la interpretación del pasado precolonial.

Jiménez Osorio, Liana [155] see Posselt Santoyo, Emmanuel

Joannin, Sébastien [78] see Cromartie, Amy

Joe, Mervin [179] see Lyons, Natasha

John, Christian [101] see Mejía Ramón, Andrés

**Johnson, Ann****[126]***New Interpretations of the Clovis Anzick Site, 50 Years after Its Discovery*

Over 100 lithic tools accompanied the burial of a two-year-old Clovis boy. While this assemblage has been called a cache by some, these artifacts appear to have been left as grave goods, so the child would have needed tools in the next life. Some artifacts have nicks and breaks, or have been resharpened suggesting that this collection was gathered from materials at hand from friends and family and were not specifically prepared as grave goods. The general 100-mile radius around the site is rich in source locations, and I suggest these quarries are the source of most raw materials. In 1980, the Smithsonian Institution funded a backhoe investigation by John Albanese into the geoarchaeology of the site. Trenches were about 1.6 m deep and stopped when water was encountered. No archaeological materials were identified, supporting a conclusion that there were no Clovis camps in the immediate vicinity of the burial.

**Johnson, Camille (Trinity University), Rachel Kaufman (Trinity University), Cecelia Turkewitz (Trinity University) and Rohan Walawalkar (Trinity University)****[19]***Exposing Our Roots: Trinity University's Legacy of Slavery*

Following the lead of other institutions, a group of faculty and students of the Roots Commission at Trinity University in San Antonio, Texas, have been researching racism and inequity in the university's history. Since 2018, the research goal has been to uncover ways in which the institution and its founders benefited from slavery. Student researchers used nineteenth-century digitized archives, ethnographic narratives, genealogies, and census data to piece together Trinity's story since its founding in 1869. They designed a website to synthesize their findings in the form of online exhibits. These exhibits explain the racism present in east Texas and the Cumberland Presbyterian Church during the founding, and on the founders of Trinity, their Confederate ties, former slave holdings, and anti-Reconstruction ideologies. This research sits within a broader movement recognizing the structural impacts of slavery in higher education and calling for change to rectify the injustice. This research, done with support from the current administration of Trinity University, highlights school ties to exploitation and racism at individual and institutional levels since its inception. Despite previous efforts to distance themselves from that past, we hope that these discoveries motivate Trinity to make restorative justice a priority in its mission.

Johnson, Eileen [126] see Hurst, Stance

Johnson, Eileen [67] see Jones, Lila

**Johnson, Elizabeth (Thunderbird Archeology/WSSI)****[183]***Digging Out: Finding Creative Solutions to Four Decades of CRM Collections*

When Wetland Studies and Solutions Inc. purchased Thunderbird Archaeology in 2004, they found themselves responsible for some 800 boxes of artifacts from more than four decades of CRM projects. The story isn't an uncommon one . . . boxes of CRM projects sitting in basements, sheds, storage units, or warehouses in various states of curation; however, WSSI tackled this responsibility head-on. Challenges were encountered every step of the way, from documenting exactly what we had and the condition of those collections, to determining who owned them and how we could legally transfer them to a curation repository. Just when we had resolved these issues, a recession came along that created a whole new set of legal issues involving companies going out of business and brought questions regarding property ownership. Faced with legal, ethical, and financial challenges, we worked to find creative solutions to finally placing these collections in permanent curation repositories.

**Johnson, John (Santa Barbara Museum of Natural History)****[55]***Linking the Past to the Present: Collaborative DNA Research with Native Californians*

At the time of European contact, a high degree of linguistic diversity characterized Native California, implying a long prehistory of different ethnic groups migrating into the region. Previous research, using mitochondrial DNA samples contributed by living descendants, produced correlations between certain genetic markers and populations that spoke related languages. The advent of ancient DNA testing not only permits an increased understanding of past genetic diversity within particular cultural groups, but also demonstrates continuity of certain genetic lineages between ancient populations and tribal descendants today. Such studies benefit California Indians by validating ancestral connections to tribal homelands, thereby providing a scientific basis for establishing cultural affiliation and descendance as defined by federal and state laws.

Johnson, Kathleen [150] see White, Joyce

**Johnson, Lisa (University of Nevada, Las Vegas), Felipe Trabanino (Jardín Botánico CECON-USAC), Eloi Berube (McMaster University) and Eos Lopez (Universidad Nacional Autónoma de México)****[181]***Microarchaeology and the Production of Urban Life at the Classic Maya City of Palenque*

Archaeological studies of urbanism typically include a consideration of scale, from the household, the neighborhood, ward, and city. These spatial scales are also spheres of interaction and have implications for the kinds of shared material practices we can expect to find archaeologically. And while urban studies in the Maya region tend to privilege the large-scale unit of analysis that is the city, this paper begins with the smallest scale, the household. Using micro-methods including paleoethnobotany, micromorphology and

soil chemistry, we consider single events within the household and how they were structured by a larger, “urban social field.” We discuss the continuity of practice across multiple generations of a single elite household in the Classic period Maya city of Palenque and consider the ways households (and potentially neighborhoods) within the same city may distinguish themselves through a set of shared ritualized practices. And finally, we argue for continued microscale analyses in the consideration of the production of urban life.

[181]

Chair

Johnson, Nadia [101] see Mejía Ramón, Andrés

**Johnson, Rachel (Tulane University) and Jason Nesbitt (Tulane University)**

[15]

*A Comparison of Ceramic Compositions from Canchas Uckro (Ancash) and the Cave of the Owls (Huánuco), Peru: Implications for an Upper Amazon Interaction Sphere*

Despite decades of archaeological research, the economic and social ties connecting the eastern Andes and Upper Amazon remain underexplored. Stylistic and compositional comparison of ceramics from the sites of Canchas Uckro (ca. 1100–850 BCE), a large monumental platform situated above the Puccha River, and the Cave of the Owls, on the Monzón River near modern-day Tingo María, help to clarify the nature of interaction in this region during the late Initial period. This study reanalyzed ceramics from the Cave of the Owls, housed as the Ross Collection at the University of California Berkeley’s Hearst Museum, using a Dinolite handheld microscope to conduct descriptive paste analysis focused on mineral non-plastic inclusions, clay characteristics, and superficial decorative elements. These results were compared with a prior Dinolite study of stylistically similar sherds from Canchas Uckro characterized by zoned-hatching motifs reminiscent of the Wairajirca style of the upper Huallaga region. While the pottery broadly demonstrate different technological styles, the joint use of similar raw materials may support previous hypotheses of an interaction sphere linking the eastern Andes of north-central Peru and the Upper Amazon during the late Initial period.

**Johnson, Taryn (Texas A&M University) and Anna Linderholm (Texas A&M University)**

[7]

*The Prehistoric Diet: Genomic Analysis of Bonneville Estates Paleofeces, Nevada*

The genetic composition of paleofeces from Bonneville Estates Rockshelter (BER) can aid environmental and dietary reconstruction, as the genomic content of coprolites change as environmental conditions shifted from cool and moist in the Pleistocene to hot and dry in the Holocene and as new food sources appeared locally. In order to analyze the potential shift in taxonomic diversity and genetic biodiversity present in prehistoric diets and microbiomes of the human occupants over this transitional period, ancient DNA was extracted from over 40 BER paleofecal samples that date between the Paleoindian and Archaic periods of western North America (12,500–1000 years ago). Taxonomic identifications of floral and faunal, and microbial parasite contents were given at the family and genus level. Results were compared to analyze how Archaic diets shifted through occupation. Further research will be done to determine if additional shifts, be they cultural, populational, or otherwise occurred alongside the dietary one. Broader applications of this study engage with the effect climate change can have on floral and faunal populations and how humans have interacted with the biotic parts of their environment both physically and microbially, leading to greater understanding of past and present relationships between humans and their ever-changing environment.

**Johnston, Elizabeth (University of Manchester, UK) and Michael Buckley (University of Manchester, UK)**

[9]

*Use of Proteomic Methods for Biological Age Estimation at Death*

Biological age at death (AAD) is an important component of the biological profile, to aid investigators in cases with skeletal remains, also in archaeology to aid establishing site context. Current methods rely on predictable patterns of bone or teeth mineralization, growth and fusion or damage over time, though these methods are often subject to inter-/intra-observer error and can only provide adequate data for juvenile remains; leaving adult remains with wide age ranges that do not support investigators. This has led forensics to study archaeological analytic methods of ancient biomolecules, such as DNA and proteins, that are frequently well preserved within bone to allow a host of analytical methods. Previous research has demonstrated applicability of proteomics in forensics and that proteins undergo age-dependent changes by comparing middle to end of long bones. In this research, we used proteomic methods to study changing protein abundances between entire skeletal elements from rats of different ages, to view changes over time. We also compare proteomic methods with other approaches to estimate AAD via amino acid decay, evaluating the most appropriate for forensics. A standardized method of AAD estimation with proteomics is necessary to bring proteomics to forensics as a validated method of age estimation.

Johnston, Kevin [48] see Paine, Richard

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

[14]

*The Bones of a Community: Mortuary Contexts over Time at Waywaka (Andahuaylas, Peru)*

Bodies formed a significant component of the ritual practice at Waywaka, an early farming village in the Andean highlands (Andahuaylas, Apurímac, Peru) that was occupied from 1600 BC–AD 700. Recent excavations from 2019 show that the village’s early inhabitants buried their dead in their domestic areas and used parts of bodies of the dead in various ways throughout the occupation areas. Excavations uncovered a total of 15 mortuary contexts with the remains of a minimum of 20–25 individuals.

These individuals were excavated from both primary and secondary mortuary contexts, the latter including skull offerings, foundational offerings, and the deliberate association of parts of bodies with ritual artifacts. The high variability of types of human burials suggests the presence of dynamic mortuary practices at Waywaka. Preliminary results may indicate a shift from primary, individual burials to communal, commingled burials over time, which could possibly reflect the origins of ancestor cults and the heightened and increasingly formalized influence of extended kin groups.

**Jonassen, Alexandra (University of California, Riverside) and Kenichiro Tsukamoto (University of California, Riverside)**  
[22]

*Application of the Geospatial Method to On-Floor Assemblages: A Case Study from the Classic Maya City of El Palmar, Mexico*  
On-floor assemblages provide clues as to how complex administrative and domestic activities interplayed within a structure. By combining photogrammetry, total station and GIS, we developed a geospatial method that plotted each on-floor remain accurately on a GIS map. This poster presents its application to horizontal excavations that took place at the Guzmán Group, an outlying group of the Maya archaeological site of El Palmar, Mexico. During the 2019 summer season, the excavations uncovered the south room of Structure GZ7 with new glyphic texts carved on a curtain holder. The texts suggest that this room was occupied by a young member of non-royal elite lakamob (banner-bearers) who played critical roles in dynastic alliances during the Late Classic period (AD 600–800). After the excavations, attributes of these on-floor materials were connected to their locations in the GIS map which allowed for in-depth artifactual and spatial analyses of the structure. The results provide new insight into our nuanced understanding of Classic Maya banner-bearers' ritual, administrative, and daily practices.

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

[67]

*Interpreting a Mid-Eighteenth-Century Vertebrate Assemblage from a Probable Comanche Site on the Southern High Plains of Texas*

Whiskey Flats is a mid-eighteenth-century probable Comanche site on the Southern High Plains in Midland County, Texas. Ongoing excavation in Mustang Draw of the now dry Mustang Pond uncovered evidence of occupation along a terrace and a bone bed within the pond basin. A modern bison periotic from the bone bed dates to the mid-1700s. Artifacts from both areas include lithics, metal, and a glass bead. The collection primarily is composed of a vertebrate assemblage that includes culturally modified modern bison and modern horse, along with remains of local fauna. Attention has been focused on the analysis of faunal remains to create a better understanding of the nature of the deposit and inhabitants of the site. Taxonomic assessment and taphonomy have been used to interpret the assemblage in terms of ecological community and the order of the events that may have taken place during the accumulation of the assemblage. The methods applied have been successful in reconstructing the environmental conditions, butchering process, and aggregation of the assemblage during and after the occupation of the site. The data gathered contribute to the general knowledge of the people and environments of the Southern High Plains and its changes over time.

**Jones, Sharyn (Northern Kentucky University)**

[156]

*Consuming Our Pasts: Food as Nature and Culture*

Taking inspiration from post-humanist theory, I frame my work about human life both past and present in a way that attempts to avoid traditional concretized definitions of humanity and culture that envision these subjects as separate from nature or the environment. Post-humanists view humanity as only part of a much bigger and richer montage that makes up the world, life, and our interconnected being. This perspective allows us to explore the past in compelling ways. While food-focused archaeologists have long argued that food is much more than sustenance or calories, if we go a step further and envision nature from a perspective that assumes dimensions of a live essence and active intricate existences, rather than something to be mastered or dominated, our understanding and appreciation of these complex relationships may deepen. Four central concepts provide the foundation for my efforts to flesh out these connections. These principles are human-nonhuman relationships, terroir, materiality, and health (or well-being). Using this framework and multiple lines of evidence drawn from nearly two decades of field research in the Fiji Islands I am working to grasp the subtle manner in which human identities, experiences, foodways, and nature connect and comingled in the past.

Jones-Cervantes, Shelby [7] see Pryor, John

Jöns, Hauke [98] see Segschneider, Martin

Jorgeson, Ian [145] see Boulanger, Matthew

Joyce, Arthur [102] see Hedgepeth Balkin, Jessica

Joyce, Kaley [54] see James, L. Brock



**Joyce, Rosemary (University California Berkeley)****[181]***Discussant***Juarez, Santiago (Colgate University)****[116]***Cosmology at Home: Ritual Caching within the Residences of Late Preclassic Noh K'uh, Chiapas Mexico*

The Late Preclassic (400 BC–AD 200) site of Noh K'uh is located in the Mensabäk basin, 30 km west of the Usumacinta River. Noh K'uh was a small ceremonial center composed of several residential groups centered around a ceremonial plaza. Noh K'uh's location near the western edge of the Maya lowlands placed the residents near contemporary civilizations in the Isthmian sphere and the highlands of Chiapas. Preliminary data from the excavations demonstrates household ceremonial materials and practices that were influenced by multiple contemporary civilizations. This research reveals how the people of Noh K'uh integrated cosmological beliefs and practices within their domestic routines.

**[116]***Chair*

Juday, Glenn [179] see Taieb, Juliette

**Judkins, Abigail (University of New Mexico)****[99]***On the Edge of the Colonial Sphere: The Effects of Indirect Interaction on Subsistence Strategies in Northern Alaska*

How did trade participation impact human-environmental interactions? It is known that the fur trade was a significant part of eighteenth- and nineteenth-century life in southern Alaska. However, the effects of the fur trade and the whaling industry on northern Alaskan lifeways have been understudied. Sustained interaction between traders and Indigenous communities did not begin until the emergence of the whaling industry, but the presence of an extensive Native trading route made it possible for goods to be easily moved throughout the region and facilitated the exchange of furs for items such as copper kettles and tobacco. In this paper, I use results from my study of the historic zooarchaeological assemblage from the Walakpa site in northern Alaska to assess what influence the fur trade had on animal exploitation. I consider the taxonomic frequency and culinary processing patterns to examine how commercial trading activities affected the foraging strategies and species exploitation in this region. Finally, I compare these data to those from the precontact Thule period to examine if there is a continuance of traditional hunting and processing methods into historic times.

**Juengst, Sara (UNC Charlotte), Sarah Rowe (UT Rio Grande Valley) and Guy Duke (UT Rio Grande Valley)****[14]***A Manteño Burial from Buen Suceso, Ecuador*

When Spanish explorers arrived in South America, sea-faring Manteño peoples dominated much of the northern and central Ecuadorian coast. While Manteño sites and technologies are well-documented, particularly at large sites such as Cerro Jaboncillo, many questions about Manteño society and mortuary traditions remain, particularly concerning people who lived on the edges of Manteño influence. In this poster, we present mortuary and bioarchaeological analyses of a burial from Buen Suceso, a site on the central coast of Ecuador with a Manteño component. Dated between 1433 and 1460, this burial includes two primary burials of a young female individual and an older male individual adorned with copper, and two secondary burials of an infant and an adult individual who was likely de-fleshed after death. We suggest that aspects of this burial reflect the multiple cultural influences in the region, as many of the mortuary traits suggest southern Guancavilca practices in addition to Manteño practices. We also present bioarchaeological data that show evidence for disease and trauma during the lives of these individuals. Finally, we show the first evidence for de-fleshing as part of mortuary treatment among Manteño peoples.

Juliosson, Arni Daniel [179] see Hambrecht, George

**Juptner, Derick and Jordan Pratt (Texas A&M University)****[13]***Analysis of the Faunal Distribution at the Weed Lake Ditch site (35HA341), Southeastern Oregon*

Weed Lake Ditch is an open-air site located on the relict shores of Pluvial Lake Malheur in the Harney Basin of southeastern Oregon. Excavations by the University of Nevada, Reno, and the Center for the Study of the First Americans (CSFA) have revealed multiple stemmed points and crescent lithic technology in buried contexts. Faunal remains from the site are numerous but heavily fragmented in nature. Despite this, the faunal remains are still informative for making interpretations about the paleoclimatic and ecological conditions of the region during the site's occupation. Distribution of the bone is not even throughout the site and is primarily concentrated in turbated soil roughly 20 cm below the surface in association with a dense cultural layer. Thorough excavation methods used by the CSFA resulted in increased recovery of faunal remains, enabling us to more effectively capture the overall faunal dispersal at site. Here we display the initial analysis of the faunal remains, as well as speculate on the meaning of their distribution, and how it is correlated with the coinciding lithic assemblage.

Jurský, Adam [23] see Saldaña, Gabriela

Justinvil, Delande [20] see Troccoli, Ruth

**Kaeding, Adam and Eleanor Harrison-Buck (University of New Hampshire)**

**[80]**

*The Maya at Spanish Contact in the Lower Belize River Watershed*

Throughout the colonial period the Mérida-based Spanish administration organized and launched multiple entradas headed south into the Petén. These entradas ranged from relatively small groups of religious missionaries and their envoys, to private armies funded by opportunists seeking a reward of prestige and political power. The goals of these advances included the conversion of Maya people living as non-Christians in the areas beyond the reach of the colonial church network, toppling what has been deemed the "Last Maya Kingdom," capturing Maya laborers who had fled their colonial circumstances, and securing the untamed area beyond the southern border of administrative control. For over a century, these largely unsuccessful entrada efforts left their mark on the historical and archaeological record. Many of these journeys traversed the survey area of the Belize River East Archaeological Project (BREA). This paper presents the results of the ongoing BREA efforts to gather the documentary and archaeological evidence for these earliest European incursions into this portion of Belize and characterize the landscapes and communities they encountered.

Kaeding, Adam [80] see Murata, Satoru

Kaiser, David [53] see Keyser, James

**Kakaliouras, Ann (Whittier College)**

**[112]**

*Discussant*

Kaliba, Potiphar [40] see Hanson, Annalys

**Kallenbach, Elizabeth (Museum of Natural and Cultural History, University of Oregon)**

**[95]**

*Fiber Identifications of Paisley Caves Textiles: Exploring Plant Selection for Technology in the Northern Great Basin*

Plant fiber identifications were made for a subset of Oregon's Paisley Caves cordage and netting in order to explore plant selection for fiber technologies. Fiber artifacts from this assemblage include basketry, matting, netting, cordage, and rope, with the oldest braided rope dating to ca. 12,000 years ago. Ethnographically, Northern Great Basin peoples relied on steppe shrub and lakeshore marsh ecosystems for basketry materials. Bulrush (*Schoenoplectus* and *Scirpus*), cattail (*Typha*), Juncus rush (*Juncus* sp.), sagebrush (*Artemisia*), willow (*Salix*), cliffrose (*Purshia*), and juniper (*Juniperus occidentalis*) were used for coarser rope, basketry, and clothing, while fine cords for sewing, fish lines, and nets were made from the inner bast fibers of stinging nettle (*Urtica dioica*), milkweed (*Asclepias*), dogbane (*Apocynum*) and blue flax (*Linum lewisii*). However, this diversity of plants has not been well documented in the archaeological record. This pilot study establishes a baseline of known taxa for a subset of fiber artifacts from Paisley Caves using polarized light microscopy methods. Additionally, this project examines changes and continuity in bast fiber use over time, augmenting our knowledge of Northern Great Basin paleoethnobotany.

**Kamp-Whittaker, April (University of New Mexico)**

**[137]**

*Social Networks and Community Features: Identifying Neighborhoods in a World War II Japanese American Incarceration Center*

Socially defined neighborhoods develop through frequent face-to-face interactions among residents and their self-identification as neighbors. Archaeological evidence of neighborhoods is usually dependent on artifact frequencies, boundaries, or shared features. This paper explores how effectively communal features act as proxies for social interaction. Network data drawn from historic newspapers published by internees at Amache, a World War II Japanese American Incarceration Center is used to create networks of interaction between residents of a block, generally viewed as a neighborhood. Within a sample of residential areas these interpersonal networks are compared to the frequency of community landscape features to see how well archaeological remains correspond to network data in identifying socially defined neighborhoods archaeologically.

**[137]**

*Chair*

Kansa, Eric [10] see Wells, Joshua

Kansa, Sarah [10] see Wells, Joshua

**Kaplan, Emily (National Museum of the American Indian), Richard Newman (Boston Museum of Fine Arts) and Christopher Beekman (University of Colorado, Denver)**

**[133]**

*Characterization of the Binder Used for Late Intermediate Period Ica Painted Wooden Boards*

Wooden objects excavated by Max Uhle and others from LIP sites in Ica, Peru, have been identified variously as *guares* (steering boards for sailing rafts) and ceremonial agricultural implements. Rather than examining the function of these items, we have to date focused on their manufacturing components. These oversized wooden objects are often elaborately carved and decorated with paint, metal sheet and pins, and sometimes feathers. The binder used for the paint has not to date been identified. As part of a larger study to identify plant resins used as paint binders in the prehispanic and colonial Andes, we compare paint samples from these boards with a group of likely plant exudates from herbarium specimens and results from analysis of other painted Andean objects.

[133]

Chair

Kaplan, Emily [133] see Katz, Monica

**Karastamatis, Kallista, Ashley McKeown (Texas State University) and Courtney Siegert (Texas State University)**

[32]

*The Down and Dirty: Differential Preservation of Burials from Eighteenth- and Nineteenth-Century Cemeteries on Sint Eustatius, Dutch Caribbean*

This study explores the markedly different preservation of skeletal remains from two historic cemeteries situated within 500 m of each other on the Dutch Caribbean island of Sint Eustatius. The burials of eighteenth-century enslaved Africans are located along the coast and are eroding onto the beach below. The nineteenth-century graveyard was associated with a nearby leper colony, known as the Lazaretto, and despite being nearly a century younger, the skeletal remains are in far worse condition. Qualitative and quantitative analysis of the differential preservation present in the cranial elements and long bones was performed, and ArcGIS was used to visually depict the taphonomic differences between the two sites. Several variables were evaluated, including grave depth, soil attributes, and funerary practices to explain the variation observed.

**Karbula, James (Quanta Environmental, LLC.)**

[173]

*A Critical Reevaluation of Radiocarbon Ages from the Berdoll Site (41TV2125), in Support of Refined Site Spatial and Contextual Analyses*

The Berdoll site is a deeply buried early Archaic campsite in the floodplain of Onion Creek in Travis County, Texas. It presents direct evidence of plant food processing at approximately 7606–8291 BP (conventional). Seventeen charred botanical remains including onion bulbs from earth ovens were submitted to two different radiocarbon labs for analysis. Considered critically, six burned rock features utilized on a temporarily stable terrace landform were assigned a temporal span of approximately 367 years, 7736–8103 BP. Using modern Bayesian statistical techniques, recalibrations, and calendar conversions in OxCal 4.3 (IntCal13), these radiocarbon ages are reexamined for accuracy, and then utilized as another line of archaeological evidence to determine the sequence of, to separate out, and to narrow the age ranges of the occupations at the site. Updated calibrations and conversion to calendar ages suggests two primary periods of site use: ca. 6600–6800 and 7000–7150 BC. At least one “single-use” event is identified from 6600 to 6800 BC. These studies demonstrate how the use of Bayesian inference can narrow the range of site radiocarbon ages; assist in the vertical and horizontal spatial and contextual analyses of archaeological features, occupations, and components; and provide correlations to known events in history.

Karkanias, Panagiotis [95] see Holcomb, Justin

**Kassabaum, Megan (University of Pennsylvania), Arielle Pierson and Erin Spicola (University of the Arts)**

[64]

*Connecting Past and Present Landscapes through Museum Education and Public Archaeology*

Native American mound sites and their inhabitants are often misunderstood by local communities and are severely underrepresented in educational curricula despite being a primary research focus for North American archaeologists. These monuments stand as testament to the creativity and skill of their builders and provide important, material touchstones between modern populations and the ancient past, yet they are rapidly disappearing due to erosion, farming, development, and looting. Education aimed at populations who interact with mound sites as part of their quotidian landscape is key to their protection and to engendering respect for past and present Native communities. During summer 2019, in pursuit of this goal, we opened an exhibit focusing on Native American moundbuilders in the Wilkinson County Museum in rural southwestern Mississippi. The exhibit’s goal is to connect visitors with the past inhabitants of their land by emphasizing how a shared landscape has led to similar lifeways through time (e.g., hunting, fishing, and cooking similar game; use of familiar natural resources; and construction of communal and ritual structures). This paper will describe the methods we used to achieve this goal and evaluate its effectiveness as well as discussing future steps necessary to expand its impact.

**Kassebaum, Theo (University of North Carolina, Chapel Hill)**

[129]

*Bones to Herds, and Back Again: An Investigation into Age-at-Death Models Used in the Analysis of Sheep (Ovis aries) and Goat (Capra hircus) Remains*

Sheep (*Ovis aries*) and goats (*Capra hircus*) are foundational to the discussion of the spread of domestication across Anatolia and southeastern Europe, but the similarity of their archaeological remains poses a major hurdle to understanding species-specific management practices. Responding to the difficulty in separating caprines by species, this paper explores whether the use of aggregated totals of sheep and goat remains in age-at-death models can accurately depict animal management strategies in place.

Simulations of combined sheep and goat herds, representing idealized survivorship models, are used to evaluate how variables such as sample size, herd composition, and age-at-death affect an accurate depiction of production strategies. Results indicate that while aggregated totals can be used with some success to determine animal management practices, extreme caution should be taken when interpreting compiled data. The findings are discussed with respect to regional meta-analyses and the publication of caprine data.

Kataoka, Osamu [83] see Ono, Rintaro

**Katz, Monica (Hispanic Society of America), Emily Kaplan (NMAI), Richard Newman (MFA Boston) and Maria Cecilia Alvarez-White**

[133]

*Unresolved Questions in the Study of Mopa Mopa: History, Geography, and Chemistry*

*Mopa mopa* is the collective name given to the resin from species of the plant genus *Elaeagia* (family Rubiaceae) that grows in regions of Peru, Ecuador, and Colombia. The resin has been used from prehispanic times to the present day to decorate a range of objects from colonial Inka *qeros* to highly decorated and prized luxury viceregal wooden objects such as chests and writing desks represented in museum collections around the world. The resin is used today by master artisans in Pasto, Colombia, for a folk art style called *barniz de pasto*. The study of *mopa mopa* is beset with apparent contradictions due to the scant archaeological record, inconsistently interpreted historical accounts, and limited ethnohistorical and art historical research. Challenges for experimental archaeology and the study of the chemistry of the resin have included the difficulty of obtaining botanical reference standards with which to compare samples from collections objects, and the relatively rare nature of the plant source and limited geographic access to raw material. Here, we review original source material, attempt a timeline, and consolidate the current information on botanical dispersion of the plants and published chemical analyses to provide a road map for future study.

Kaufman, Rachel [19] see Johnson, Camille

Kaufmann, Cristian [28] see Gutierrez, Maria

Kealhofer, Lisa [150] see Bhattacharyya, Tiyas

**Keevil, Trevor (Purdue University), Melissa Torquato (Purdue University), Sarah Coon (Purdue University), Jacob Harris (Institute of Human Origins) and Erik Otárola-Castillo (Purdue University)**

[74]

*Re-evaluating Butchery Marks from a Mastodon Assemblage Using 3D Geometric Morphometrics and Experimental Archaeology*

At the end of the Pleistocene, North America experienced a mass extinction of megafauna, including proboscideans—mammoth and mastodons. Archaeologists and other scientists continue to debate the role of human predation in these extinctions. Some point to traces of human butchery, such as cut marks and other bone surface modifications (BSM), as evidence of human predation on proboscideans. Others, however, challenge the validity of the butchery evidence observed on several proboscidean assemblages. This is primarily due to the imprecision of qualitatively determining the agent responsible for creating BSM. This study employs novel 3D imaging and 3D geometric morphometrics to assess the BSM's origin on the Bowser Road mastodon (BR), excavated in Middletown, New York. These procedures accurately distinguish different types of BSM. To better characterize BSM on the BR, we compared them quantitatively to experimentally generated chop and plow marks. Experiments produced chop marks on bones using a motorized force-calibrated lever arm wielding replicated stone choppers. We created experimental plow marks using modern agricultural equipment. Results indicate that BSM on the BR are inconsistent with our experimental butchery marks. These conclusions are preliminary but contribute to the dialogue surrounding humans' role in the extinction of North American megafauna.

Keevil, Trevor [173] see May, Alejandra

**Kehoe, Alice (Retired scholar)**

[57]

*Moderator*

**Kehoe, Alice (Retired scholar)**

[126]

*Ruthann, the Leader-Hearted Woman – inawa'sioskitsipaki*

The Blackfoot, in whose territories Ruthann Knudson worked, recognize some women as inawa'sioskitsipaki, a "leader-hearted woman." Such a woman is strong, intelligent, highly moral, outstandingly capable in the tasks she carries out, kind, and generous. She is deeply respected and listened to. Oscar Lewis, in a classic paper, introduced the phrase but translated it as "manly-hearted woman." Contemporary Blackfoot speakers say "leader-hearted" is closer to its meaning. Ruthann didn't act macho; she was calm, steady, collegial, and clear-headed on what good science and good public outreach required. Wherever she worked, she was the leader people needed. I will describe her work for the Blackfeet Nation and the Museum of the Plains Indian, work epitomizing an inawa'sioskitsipaki.

**Keller, Hannah (Yale University), Fabio Negrino (University of Genoa), Claudine Gravel-Miguel (Arizona State University), Naomi Cleghorn (University of Texas, Arlington) and Jamie Hodgkins (University of Colorado, Denver)**

[40]

*A Taphonomic Comparison of Two Late Pleistocene Zooarchaeological Assemblages in Northwest Italy and South Africa*

A driving question in paleoanthropology is the extent of behavioral divergence in hominin species, particularly Anatomically Modern *Homo sapiens* (AMH) and Neanderthals. Generally, direct comparisons are restricted to Europe, where both hominin species were interacting within the same environmental constraints. However, obtaining species-level site-use patterns should also consider non-European groups of AMH for comparison with Neanderthals. Coastal South Africa offers an optimal record for such a comparison—a human population that was likely among the most distantly related to contemporary AMH in Europe. This study compares the faunal taphonomy of two late Pleistocene cave sites: the Mousterian deposits at Arma Veirana (AV) in northwestern Italy (≥45,000 BP) and Knysna Eastern Heads Cave 1 (KEH-1) in coastal South Africa (46,000–19,000 BP). Both sites are located in temperate zones. Our goal is to understand how the different geological contexts of these two caves will impact faunal taphonomy, particularly bone surface visibility, and thus comparisons of behavior. Approximately 900 (AV) and 500 (KEH-1) faunal specimens from both assemblages were analyzed using standardized zooarchaeological methodologies. We assessed extent and frequency of acid destruction and fragmentation. Subsequent studies will compare anthropogenic taphonomy between the sites to identify potential species-wide behavioral divergences.

[40]

Chair

**Kellett, Lucas (University of Maine, Farmington)**

[47]

*The Settlement Ecology of Chanka Pastoralists in the Andahuaylas Region of Southern Highland Peru*

This paper examines the settlement ecology of late prehistoric camelid pastoralists of the Andahuaylas region of southern highland Peru. In particular, the paper synthesizes survey based settlement data collected from the Chanka Settlement Project (PAC, 2005–2006) and Andahuaylas Puna Project (PAPA, 2018) and highlights variable settlement patterns and landscape use during the Late Intermediate period (LIP, ~1000–1400 CE). Research results indicate that within the Andahuaylas (Chumbao) Valley, there existed a broad agropastoral spectrum, with some pastoral communities more spatially, culturally, and economically distinct, while others were more closely integrated with agricultural populations and large residential sites. The paper explores potential factors (e.g., topography, abundance of resources [water], defensible terrain) which may help explain the variable settlement ecology among camelid pastoralists across the valley. Finally, the paper highlights the underappreciated adaptability and versatility of camelid pastoralists in the central Andes during the tumultuous, risk-laden LIP.

**Kelley, Alice, Bonnie Newsom (University of Maine, Orono), Jacquelynn Miller (Jensen Hughes, Baltimore) and Kristin Schild (University of Maine, Orono)**

[35]

*So Many Sites, So Little Time: Shell Heaps on the Maine Coast*

Climate change induced impacts (accelerated sea level rise, increased storm frequency and intensity, and additional freeze/thaw events) are destroying shell heap, or midden, sites all along the Maine coast. Some sites described 20 years ago are now gone. With approximately 2,000 known sites, it is impossible to have each evaluated by trained professionals using traditional archaeological methods. However, cultural resource prioritization decisions require data, not anecdotes. UMaine researchers have developed geophysical (ground-penetrating radar), remote sensing (drone-based imaging and modeling), and citizen science approaches to collect and archive data to assist in cultural resource management decisions. Ground-penetrating radar, when combined with existing archaeological knowledge or minimal excavation, can provide more complete knowledge of midden extent and stratigraphy than auger or shovel test pit surveys. 3D, georeferenced, high-resolution models of shell middens created from drone imagery establish midden morphology and a create baseline for erosion studies. Citizen scientists are able to collect erosion rate data using simple tools, and also document seasonal/annual change through photography. Additionally, they act as “eyes” on the ground to alert regional professionals of significant erosional events. With strong collaboration among state cultural resource agencies, researchers, and citizen scientists, important cultural heritage can be saved.

**Kelley, Alice**

[113]

Discussant

Kellner, Corina [128] see Conlee, Christina

**Kelly, Dylan (University of New Hampshire)**

[147]

*Applying Circuit Theory to Colonial Expansion Modeling in the Great Bay Estuary, New England.*

During the early 1600s, the Great Bay Estuary was a frontier colonial settlement that rapidly became an economic hub for the extraction and export of natural resources into the West Indies trade network. Being directly accessible from the Atlantic coast of modern-day New Hampshire, the Great Bay Estuary provided a logical point of entry for water vessels and served as a corridor into the surrounding area. Thus, colonization and the accompanying land-use changes in this landscape are known to have expanded outward from the estuary. We use Circuit Theory to develop a model of early colonial activity to understand the potentialities inherent for European settlers inhabiting a deeply unfamiliar landscape. The model emphasizes the influence of navigable waters, topography, and access to adequate moisture for agriculture on the decisions of the colonizing English. We generate a series of current maps using Circuitscape software and compare the density of electrical currents at known archaeological sites to the

surrounding landscape. We aim for this case study to inform the use of Circuit Theory in modeling human activities in past landscapes and aid in the development of new techniques for understanding the processes of colonization and expansion in landscapes around the world.

Kelly, John [153] see Goldstein, Lynne

Kelly, Kenneth [147] see Wallman, Diane

Kelly, Mary Kate [76] see Navarro-Farr, Olivia

**Kelsey, Brady (University of Connecticut), Steven Brandt (University of Florida), Elisabeth Hildebrand (Stony Brook University) and Gary Stinchcomb (Murray State University)**

**[24]**

*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 variations of ochre and associated processing tools through studies of use-wear, trace elemental signatures, and artifact spatial distributions. Excavations in the shelter's central area have uncovered over 2 m of stratified pre-MIS 3 (>~72 ka) deposits containing more than 3,000 artifacts. The areas have yielded over 500 ochre pieces weighing nearly 5 kg. The ochre is associated with light to dense concentrations of stone artifacts of highly variable modes of technology ("Modes 1–6"). The ochre also displays considerable technological variability, with the greatest variation occurring in stratigraphic levels of early MIS 3–MIS 4 age. 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 with an "artifact life-cycle" framework in the poster to gain a broader understanding of ochre technological variability. Understanding the influences and implications of ochre technology will help to discern behavioral changes in early human hunter-gatherer populations prior to and during their "successful" migration through and out of Africa after 60 ka.

Kelso, William [55] see Owsley, Douglas

Kendall, Iain [93] see Makarewicz, Cheryl

Kennedy, Jaime [95] see McDonough, Katelyn

**Kennedy, Jason (Central Michigan University)**

**[62]**

*Work Is the Curse of the Drinking Class: Beer, Labor, and Class in the Ancient Near East*

The archaeology of beer has received significant attention in the last three decades. However, many studies focus on the special role that beer played in sumptuous prestige feasts and for conducting commensal politics with an emphasis on elite motivations. In this paper, I view the production of beer as a cornerstone of state exploitation in the early states of Egypt and Mesopotamia. I will briefly outline the archaeological and glyptic evidence for beer production in the early historic periods of the ancient Near East and its role in providing for the workforce of the early state. The consumption of beer as payment for state-sponsored labor projects changes the commensal dynamics of society. Repeatedly consuming daily rations of beer at the location of labor creates an identity as worker and subject; that is, one who works for someone else for their subsistence. In this sense, beer may have been crucial in creating class identity for the worker, as well as providing the means of subjugation for the elites in society who controlled its production and distribution.

Kenney, Andrew [70] see Grimes, Vaughan

Kenoyer, Jonathan Mark [93] see Cameron, Asa

Keohane, Scott [40] see Murray, John

**Kerchusky, Sarah (Applied Anthropology Laboratory, Ball State University)**

**[128]**

*Symbolic Behavior in Household Archaeology: A Study of Late Nasca Period and Loro Period Figurines from Zorropata, Nasca, Peru*

Fifty-four fragmentary figurines, including 53 human and one animal, were recovered from archaeological domestic contexts at the site of Zorropata, located in the Las Trancas Valley, Nasca, Peru. Zorropata was a large domestic site with likely ceremonial function occupied from the Late Nasca period (ca. AD 450–600) until the early Middle Horizon/Loro period (ca. AD 600–1000).

During the Middle Horizon (AD 750–1000) period, the highland-centered Wari Empire established at least three colonies (Pacheco, Pataraya, and Inkawasi) in the Nasca Valley and its tributaries (Edwards 2010). Current research directed by Christina Conlee and Corina Kellner suggests a probable fourth Wari colony and imperial administrative center at Huaca del Loro ca. 5 km down valley from Zorropata. The overarching aim of research at Zorropata has sought to elucidate the potential impact of Wari encroachment on Nasca society. This paper focuses on a facet of that relationship and investigates the use of figurines found in household contexts. While many questions remain regarding ritual and symbolic behavior in ancient Nasca, research supports that figurines probably had a ritual function, that they changed stylistically between the Late Nasca and the Loro periods, and that they may portray at least female and male gender identities.

**Kessler, Nicholas (University of Arizona), Greg Hodgins (University of Arizona), Matthew Guebard (United States Park Service) and Lucas Hoedl (United States Park Service)**

[97]

*Wiggle-Match Dating at the Montezuma Castle Cliff Dwelling*

Most radiocarbon measurements informing Bayesian models of cultural sequences are obtained from short-lived organisms such as annual plants and animal bone. Short-lived organic material from plateaus in atmospheric  $^{14}\text{C}$  production have a calibrated error that corresponds to the duration of the plateau. This fact hinders Bayesian modeling's ability to produce long-term, high-resolution, cultural chronologies. Sequential  $^{14}\text{C}$  measurements at known time intervals (wiggle-matching) can solve this problem. We present results of a recent wiggle-matching study from Montezuma Castle National Monument, an ancestral cliff dwelling in central Arizona. Historical looting has destroyed contexts for reliable ceramic cross-dating, and dendrochronology is of limited utility for historical and ecological reasons. Previous attempts to radiocarbon date the site produced confusing results. Utilizing wiggle-matching, we produced high-precision dates from the mid-twelfth and late thirteenth centuries AD, and infer an occupational history that involves early construction, partial destruction, and disuse, followed by restoration and reoccupation. Significantly, this is the first high-precision chronometric sequence for a structure of this type in the area. Our results demonstrate that a combined approach to archaeological dating, using tactics from dendrochronology and radiocarbon dating, can objectively enhance Bayesian models of archaeological events, phase boundaries, and time spans.

Kestle, Caleb [38] see Monaghan, John

Key, Marcus [6] see Arnold, Samuel

**Keyser, James (Oregon Archaeological Society) and David Kaiser (Oregon Archaeological Society)**

[53]

*Decoding a Crow War Party Tally at 24ST560*

Site 24ST560, located northwest of Billings, Montana, contains the most detailed example of a Crow war party tally known in northern Plains rock art. Known from two avocationalist publications, we analyze the site imagery using Crow ledger drawings and Crow ethnographic information, and determine that it represents the war records of two men, both of whom were warriors of considerable renown.

[53]

*Discussant*

**Khounani, Alireza**

[117]

*Trade as a Social Activity: Eastern Sigillata and Its Near Eastern Emulation*

It has been plainly demonstrated that market systems are socially embedded, a quality that fosters the movement of information, commodities, and people. Before the industrial period, long-distance trade required the presence of commercial agents at both the distribution centers and at the destinations for sale. The kin-based structure of merchant communities would facilitate the spread of information about the local taste and the local demand for foreign commodities. In case it is inconvenient to import the commodity through trade, local entrepreneurs may find other ways to fulfill the cosmopolitan desire for stylish objects. Despite the natural barrier between Mesopotamia and the Levant, the material culture attests to a strong connectivity between the Roman Syria and Arsacid Seleucia on the Tigris. The striking similarities in the production method and forms of the Syrian Eastern Sigillata tableware and the Seleucian red-burnished ware indicate a close social interaction in the realm of exchange beyond the paradigm of disconnected producer vs. consumer. This interaction provided the ground for both cultural and technological dialogue between diverse groups while allowing opportunity for local innovation. Using fabric and typological analysis, this study aims to demonstrate that trade as a social activity moves beyond the existing cultural-political boundaries.

**Kidwell, Jasmine (Applied EarthWorks Inc.)**

[36]

*Unpacking the Geoarchaeologist's Geospatial Tool Bag: A Case Study Using Predictive Modeling on the Central Coast, Pismo Beach, California*

While geographic information system (GIS) based modeling applications are not new to archaeological practice, they offer a suite of tools and techniques for building a robust geoarchaeological dataset when used judiciously. Such models utilize geologic unit and age, soils, slope, aspect, distance to water, distance to known resource procurement areas, or other data deemed appropriate for analysis. A recent compliance-driven project posed an interesting geoarchaeological problem: Does a known site extend into the median of a busy highway in need of modification, where site boundary testing would be unsafe? To supplement excavation outside

of the highway right-of-way, a raster analysis was completed to study the likelihood of the site's extension into the project area by assessing the potential for surface and buried site deposits. The landscape was further analyzed to gain an understanding of time and movement across this area by the application of isotropic and least-cost pathway modeling. Surface and buried site predictive modeling coupled with models of time-based landscape and least-cost pathways comprise a comprehensive landscape-level archaeological dataset. These models have been assessed in relation to known human activity areas, providing a new perspective of this precious strip of coastline.

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

**[65]**

*New Dates for Bonfire Shelter, a Multicomponent Rockshelter in West Texas*

Bonfire Shelter is a well-known but imperfectly understood multicomponent rockshelter site located in a short tributary canyon of the Rio Grande in West Texas. The site is particularly known for three "bone beds" deposited between about 14,000 and 2500 BP, two of which appear to represent mass bison kills. Three years of renewed investigation by Texas State University's Ancient Southwest Texas Project has resulted in new observations on the complex shelter stratigraphy including additional radiocarbon dates. This paper combines new and previous dates with stratigraphic observations in an attempt to generate a chronostratigraphic model that goes beyond the bone beds to include lesser known occupations and deposits in the rockshelter, and to provide a more comprehensive overview of depositional history and site formation at this classic site.

Killin, Anton [58] see Pain, Ross

**Kim, Lynn (University of Texas, San Antonio)**

**[111]**

*The Negotiated Yunga-Inka Landscape of the Camata-Carijana Valley*

The Camata-Carijana Valley is situated on the eastern frontier of the Inka Empire in the Kallawaya domain and was inhabited by Chunchu groups from the tropical piedmont. To assess the relationships between these groups, the distribution of three key landscape features (community settlements, road network, and agrarian terracing) is placed on a spectrum of possible colonial landscapes from a state-controlled landscape (Model 1) to a locally produced landscape (Model 2). Particular attention is paid to the architectural construction of settlements, their location on the prehispanic roads, and their association with types of agrarian terraces. It is concluded that the inhabitants were able to form local spaces of agency and take advantage of their Inka ties while living within largely a state-directed landscape. The locals established a new identity that tied them both to the lowland groups and to the highland Inka.

**[111]**

*Chair*

Kim, Lynn [140] see Snow, Susan

**Kindl, Olivia (El Colegio de San Luis) and Alma Noemi Vega Barbosa (Universidad Nacional Autónoma de México)**

**[180]**

*Rock Art and Ritual Routes: Visual Complexity in Cerro de la Nariz, Wakiri kitenie (Potosino Highlands, Mexico)*

Some features of a rocky site in the Potosino semi-desert of north-central Mexico will be presented, where an ancient rock world and ritual expressions of contemporary ethnic groups, in particular the Wixarika (Huichol Indians), coincide. For the latter, the site is an important step in their ritual journey to Wirikuta, a sacred territory where they regularly make pilgrimages and place offerings that bear witness to their extensive and complex cosmology. We will explore the spatial relationships between these votive objects and some paintings found in the rock shelters of this site, contrasting them with the exegesis formulated in this regard from various points of view, to reflect on temporal and visual horizons in which gaze encounters are produced with centuries of distance. From this case study, bases will be laid to develop an interdisciplinary dialogue between anthropology of art, archaeology, and philosophy.

**Kindschuh, Sarah (Defense POW/MIA Accounting Agency Laboratory)**

**[161]**

*Discussant*

**King, Adam (SC Institute of Archaeology and Anthropology)**

**[120]**

*Pipes, Pots, and Portals: The Imagery of Middle Mississippian Pipes from Etowah*

In his study of Mississippian smoking pipes of the South Appalachian region, Blanton notes that in the Middle Mississippian period smoking rituals became more formalized and restricted to ritual specialists. He identifies several pipe themes associated with the social and political influence of Etowah. In this paper I follow Blanton in exploring the imagery associated with Etowah-related pipe themes. I argue those pipes were portals and their specific imagery connected smokers to various realms of the cosmos and important supernaturals. Further, that connection traveled in two directions, allowing smokers to both communicate with and draw from those realms and beings.

**[120]**

*Chair*

King, Adam [116] see Skaggs, Sheldon



King, Brianna [19] see Gallagher, Joanne

**King, Eleanor (Howard University)**

[75]

*Moderator*

**King, Julia**

[110]

*Discussant*

**King, Julia**

[163]

*Bridging the Divide: A Study of Fourteenth- to Eighteenth-Century Native Settlements in the Middle Chesapeake*

Archaeologists (including the author) investigating seventeenth- and eighteenth-century Native sites in the Chesapeake point out how materially different these assemblages are from those recovered from contemporary colonial sites. Characterized by materials almost wholly produced by Native hands with some objects of European manufacture, they are indeed different and have been used to argue that Native people in a colonized land resisted colonial control in part through the maintenance of Native practices. These assemblages, however, are rarely examined vis-à-vis assemblages from earlier Native sites or from contemporary Native sites, resulting in a not-so-subtle reinforcement of the deep history/colonial divide along with the assumption that the template (the “norm”) for this period is the European colonial site.

[163]

*Chair*

**King, Stacie (Indiana University)**

[135]

*Ancient Oaxaca beyond Zapotecs and Mixtecs*

[WITHDRAWN]

**Kingrey, Haden (Great Basin Paleoindian Research Unit, University of Nevada, Reno) and Richard Rosencrance (University of Oregon Museum of Natural and Cultural History)**

[21]

*The Pre-Mazama Projectile Point Sequence at the Roadcut Site (35WS8), Oregon*

The Roadcut site (35WS8) near The Dalles, Oregon, was first excavated by Luther Cressman in the late 1950s. It contained some of the earliest evidence of salmon fishing in the Columbia Plateau and a record of human occupations spanning at least 9,000 years—making it one of the most important sites in the region. The Roadcut site is often cited as containing Windust projectile points and used as evidence in support of riverine food exploitation by early Holocene foragers. Our understanding of the projectile point record at the Roadcut site is limited because Cressman employed his own descriptively based projectile point classifications. In this study, we examine the diagnostic projectile points and other lithic technological evidence from the site’s oldest stratigraphic levels to better position the site within the regional cultural history. The pre-Mazama assemblage only includes a few Windust points, while Cascade points make up the majority of the diagnostic points. Our study suggests changes in projectile point form through time and shows the potential for future lithic analysis of the collection.

Kingston, John [24] see Feak, Angela

**Kipnis, Renato (Scientia Consultoria Científica), Solange Caldarelli (Scientia Consultoria Científica), Leticia Muller (Scientia Consultoria Científica), Andrey Castro (Scientia Consultoria Científica) and Aguinaldo Castro (Scientia Consultoria Científica)**

[66]

*A Historical Perspective on the Nature of Precolonial Settlements in the Middle Xingu River Basin*

In order to understand the processes that generated the rich, complex, and diverse cultural and environmental history present in Amazonia, and specifically along the Xingu River basin, it is crucial that we generate information on when, where, and how small-scale foraging societies changed to more sedentary lifestyles and complex social arrangements based on agriculture. Here we present and discuss the archaeological record generated by research carried out within environmental licensing process of the Belo Monte Hydroelectric Power Plant in the Middle Xingu River, state of Pará, Brazil, which involved systematic regional survey and the study of close to 200 archaeological sites. It shows continuous human occupation dating back to the late Pleistocene throughout the Holocene period, with great variability in space and time of archaeological sites and material culture. The high-resolution archaeological data presents the potential to discuss issues such as the antiquity of human occupation; the emergence, or not, of hierarchical organized systems; changes in mobility and settlement patterns; gaps in the archaeological record during the middle Holocene period; the spread of agricultural practices; and dispersion of Tupi and Koriabo ceramics in the region.

**Kirakosian, Katie (UMass Amherst)**

[153]

*Dena Dincauze: The Matriarch of New England Archaeology*

Dena Dincauze (1934–2016) made a great impact throughout her archaeological career, not only in New England, but also throughout North America more broadly. As one of the first women to receive her PhD from Harvard University, Dena was also one of the first tenured female archaeology professors in the state of Massachusetts. She also took professional service very seriously, serving as the first female editor of *American Antiquity* from 1981 to 1984, for example. Her service did not go unrecognized, having received the SAA's Distinguished Service Award in 1997 and a Lifetime Achievement Award from the Massachusetts Historical Commission in 2001 for her support of cultural resource management. Dena also mentored many graduate students and worked with countless avocationalists throughout her career, who continue to expand her legacy in the field of archaeology.

[153]

Chair

Kisielinski, Caroline [1] see Potter, Bethany

Kisielinski, Caroline [83] see Stone, Jessica

**Kita, Yuko (Instituto de Arquitectura, Diseño y Arte, Universidad Autónoma de Ciudad Juárez), Annick Daneels (IIA-UNAM Mexico) and Alfonso Romo de Vivar (Universidad Autónoma de México)**

[133]

*Bitumen as Stabilizer in Earthen Architecture of the Mesoamerican Gulf Coast*

Investigations on monumental earthen architecture in the Classic period La Joya site in Central Veracruz led to the hypothesis that a bitumen additive was used as a stabilizer in construction. The use of bitumen resulted in increased resistance to weathering in a humid tropical environment, as well as control of vegetation, biofilm, and pest invasion. During 2009–2020, research advanced in parallel on two fronts: analysis of organic chemical extracts obtained from archaeological architectural samples, bitumen, and paleosoils (by gas chromatography coupled to mass spectrometry and  $\delta^{13}\text{C}$  isotope ratio mass spectrometry) and construction and monitoring of experimental mudbrick walls using as stabilizers different proportions (1%–6%) of bitumen derivatives as well as organic mucilage applied in vernacular earthen architecture in Central America, their mechanical properties analyzed in a laboratory. The results indicate that petroleum derivatives were used in ancient construction and that asphalt emulsions are additives that improve the properties of earthen construction.

**Kitchel, Nathaniel (Dartmouth College)**

[77]

*Getting It Right for the Wrong Reasons: Using ED-XRF to Characterize Red Munsungun Chert*

Artifacts made of high-quality red chert appear regularly in terminal Pleistocene fluted point period sites throughout New England. Although archaeologists in the region often attribute this material to the Munsungun Lake geologic formation of northern Maine, no large-scale effort had been made to evaluate these visual identifications through geochemical techniques. To address this situation in 2013 I employed a laboratory-based ED-XRF instrument to analyze over 200 artifacts from 24 fluted point sites located throughout New England. These analyses indicated that virtually all red chert artifacts in this analytical assemblage arose from one or two closely related, but as yet unidentified, outcrops. Subsequent geoarchaeological prospection and analyses have supported the results of the original study. While the findings of the original study appear sound, I believe these positive results came not from rigorous sampling design and thoughtful selection of analytical methods but rather from the specific geologic characteristics of Munsungun Lake “chert.” In this presentation I will discuss why Munsungun chert proved amenable to sourcing via ED-XRF to illustrate how geology came to the rescue of my original study and how, in this case, my research design was more lucky than good.

[77]

Chair

**Klassen, Sarah (University of British Columbia), Scott Ortman (University of Colorado, Boulder) and José Lobo (Arizona State University)**

[150]

*Increasing Returns to Agricultural Intensification at Angkor, Cambodia*

The dominant view in economic anthropology has been that agricultural intensification involves decreasing returns. This view is difficult to reconcile with the emergence of urban systems, which requires improved labor and land productivity to support non-food producers in urban centers. The issue is especially salient with respect to Greater Angkor Region (Cambodia, ninth to thirteenth centuries CE), the most extensive preindustrial urban agglomeration yet documented through archaeological research. Ethnographic studies of smallholder agriculture suggest decreasing returns are often associated with intensification, but rice cultivation in Southeast Asia was often organized at the community scale and utilized extensive hydraulic infrastructure. In this paper, we utilize settlement scaling theory to argue that this system of agricultural production did in fact yield increasing returns to farming labor, thus enabling a sizeable urban population to be supported without necessarily immiserating farmers. We also find spatial patterns in agricultural temple communities that are consistent with the incorporation of agricultural production within the urban economy. Our results suggest the rise of urbanism at Angkor was enabled by increasing returns to agricultural labor, brought about through the same mechanisms that structure other forms of production in urban economies, past and present.

Klassen, Sarah [150] see Carter, Alison

Klaus, Haagen [182] see Shimada, Izumi

Klaus, Haagen [127] see Turner, Bethany

Kleist, Mari [179] see Desmarais, Danii  
 Kleist, Mari [179] see Walls, Matthew

**Klembara, Nathan (Binghamton University)**

[43]

*The Foundations of a Queer Philosophy of Science: Is Archaeology the Answer?*

Despite a long history in the philosophy of the science that has defended the gendered, subjective, and value-laden nature of knowledge production, few (if any) inroads have been made into the formulation of an explicitly queer philosophy of science. In this paper, I argue that archaeologists are uniquely situated to develop such a queer philosophy of science. Ever since the groundbreaking and influential special edition of *World Archaeology* edited by Thomas Dowson in 2000, there has been a growing corpus of queer archaeological works. While these works have predominantly focused on a critique of heteronormative (and other normative) practices in archaeology, they lay the foundation for a newer, more empathetic, more human, and queerer science. Drawing on queer archaeology and feminist philosophies of science, I assert that a queer philosophy of science requires us to change the evidentiary requirements that are still rooted in Enlightenment positivist science, without abandoning our intellectual rigor. We should apply queer theory's deconstruction of stable categories (identity and otherwise) as well as its political influences and goals, to our analysis of archaeological evidence. Only then can we produce a more queer and diverse understanding of the past.

[43]

Chair

**Klembara, Nathan (Binghamton University)**

[190]

Discussant

**Klenck, Joel (National University of Samoa), Mohammed Sahib (National University of Samoa) and Epifania Suafo'a Taua'i (FAA / FPA, American Samoa)**

[47]

*Archaeology of Luatele Crater: Ritual and Prestige of the Tuimanu'a, Ta'u Island, American Samoa*

An archaeological survey covering 50 acres was conducted in and around Luatele or Judds Crater, an extinct volcano, on Ta'u Island, Manu'a District, American Samoa. The project identified 24 precontact sites comprising 101 archaeological features and a 142 m cave associated with the Samoan legend of Vaatausili. These features include star mounds, oval boulder mounds, platforms, rock walls, and terraces associated with Solo Tagata or "line of people." At the base of the crater is a large mound with small stone mounds and walls surrounding this central edifice. The archaeological features and cultural histories of Luatele suggest ritual and sociopolitical sources of mana or prestige for the persistent dynasty of the premier chief, Tuimanu'a, complementing other studies citing the intensification of agriculture during the fourteenth century.

**Kles, Maranda (Archaeological Consultants Inc.)**

[161]

Discussant

**Klesner, Catherine (University of Arizona) and Pamela Vandiver (University of Arizona)**

[44]

*Reconstructing Production Technology of Medieval Lead-Glazed Ceramics from Central Asian Silk Road Sites*

Central Asia has long been the connecting bridge facilitating the long-distance trade of goods across Eurasia. While Central Asian communities have served as trading centers, they were also producers of specialty goods and centers of technological innovation themselves. In this study we examine the technological variation within and between locally produced Central Asian glazed ceramics and imported Islamic lead-glazed wares during the Early Islamic period. Compositional analysis of ninth–twelfth-century CE ceramics excavated from 11 Silk Road sites located along the northern edge of the Tien Shen mountains in Kazakhstan has demonstrated local production of lead-glazed ceramics and the concurrent presence of imported ceramics from Southwest Asia. A representative collection of ceramics ( $n = 45$ ) were characterized by scanning electron microscopy-energy dispersive spectroscopy (SEM-EDS), and electron microprobe analysis (EMPA) including locally produced ceramics, imported ceramics from Southwest Asia, and lead-glazed ceramics whose origin was unidentified by compositional analysis. Based on the results we can reconstruct the direct transfer and adoption of lead-glazing technology from the Islamic world into the lands north of the Tien Shen mountains in the ninth–tenth century CE with local innovation of in the production of yellow transparent and opaque glazed ceramics given regional availability of raw materials.

**Klimaszewski-Patterson, Anna (California State University, Sacramento)**

[165]

Discussant

Knapke, Nancy [109] see Thompson, Christine

Knipper, Corina [21] see Fisher, Lynn

Knoblauch, Christian [36] see Rothenberg, Miriam

Knowles, Susan [184] see Law, Zada

Knudson, Kelly [45] see Scaffidi, Beth

**Koetje, Todd (Western Washington University)**

**[42]**

*Chair*

Kohler, Tim [39] see Bird, Darcy

**Kolar, Miriam (Visiting Scholar, Amherst College)**

**[84]**

*Music-Archaeological Experimentation and Aural Heritage: Human Perspectives on Sonic Experience*

Human interactions with archaeological materials and settings facilitate responsive explorations of things and places in use. In my Andean fieldwork at Chavín and Huánuco Pampa, music-archaeological experiments and ethno-archaeomusicological performance studies of artifact instruments and their replica proxies have revealed functional affordances of materials and settings. Beyond contributing materially representative data to the archaeological record that ground-truths archaeological hypotheses, this methodology offers novel processual products. Sonic experimentation as performance study and also as an aural heritage engagement serves complementary purposes. In situ performance reconstructions enable interactive analyses of setting-contextualized soundmaking, “performance soundscape science” that explores how acoustical and haptic feedback from sonic/musical instruments, architecture, and setting influence human performers’ soundmaking. “Aural heritage” is a developing term for the human communicative and perceptual implications of culturally contextualized material acoustics, inclusive of all sound-sensing modalities. Experiments activate aural heritage, directly engaging performers and observers while enabling documentation for preservation. Pivotal to these explorations are human perspectives on physical experience, which, though malleable, stem from an ancient physiology common to humans across time and geography. Therefore, acoustical-performance affordances of archaeological materials and settings produce aural heritage data and engagements of an “archaeological possibility space” that emphasizes archaeological plausibility and present engagement.

**[84]**

*Chair*

**Kolbenstetter, Marie (Leiden University / Université Paris Nanterre)**

**[132]**

*Situating Mobility: Local and Regional Connectivities in and beyond the Gulf of Fonseca (AD 800–1520)*

In precolonial times, the social landscapes of Central America underwent numerous changes. While the impetus for those social changes are still under investigation, they are well documented, both on local and regional scales, in Greater Nicoya between the Bagaces and the Sapoá periods. In the Gulf of Fonseca, to the north, archaeological data remains too scarce to contribute to this debate. However, scholars have often situated this natural feature at the crossroads of regional mobility in Pacific Central America. This paper proposes to review evidence from central Honduras, eastern El Salvador, and northern Nicaragua for regional mobility and social change between AD 800 and 1520. This data will then be contrasted with evidence from known sites in the Gulf of Fonseca exploring how the agency of preexisting localized movements may have impacted regional dynamics in this period. Finally, this paper will propose future avenues of investigations, examining how this natural feature’s affordances facilitated connectivities and contributed to the emergence of new social landscapes in Central America.

**Kollias, George (Brandeis University)**

**[152]**

*Debt and Obligation in Ancient Maya Political Economies*

The notion of debt pervades anthropological discussion of political economy and exchange. Often used as a descriptor of unequal relationships it also embodies notions of reciprocity, expectation, and mutuality. Debt carries with it a charged negativity in many contexts, conveying experiences of precarity and violence, pressure and visibility. However, debt can be considered as an important tool in the production of social cohesion, the maintenance of relationships, and the reproduction of economic networks. Here debt will be discussed as a factor in the development of authority, the creation of stratified hierarchical relationships, and as a function in economies of reciprocity which characterize ancient communities. This discussion aims to posit how we may incorporate anthropological notions of debt and embedded concepts of morality and sociality as a means to understand underlying factors in the social dynamics of hierarchical societies in the ancient past. Of particular import is the role social and economic indebtedness, and expectations of reciprocity, may have played in integrating the countryside surrounding major polities and mediated relationships with the hinterlands between ancient kingdoms.

**Kollmann, Dana**

**[48]**

*Bioarchaeological Analysis of Preclassic Human Remains Recovered from a Lime Kiln, El Mirador, Guatemala*

This paper presents the preliminary findings pertaining to the exhumation and bioarchaeological examination of a collection of Preclassic period human remains recovered from a lime kiln in El Mirador Basin, Guatemala. The disarticulated and fragmented skeletal remains of nine individuals were compressed into a roughly 10 cm layer that was atop a sterile bed of ash and buried beneath a pile of limestone. Both males and females ranging in age from a subadult to older adults were included in the kiln. While bone preservation was better than that that characterizes most Basin sites, postmortem weathering and erosion damaged most joint surfaces and precluded the full assessment of pathology and trauma. The analysis was in large part limited to cranial fragments, dental remains, and long bone diaphyses. The evidence indicates that the remains were deposited into the kiln while fleshed, and thermal alterations of the elements suggest that the kiln or accompanying rocks were hot. The articulation of body segments but the absence of discrete patterns of individual interments suggest perimortem disarticulation. This is supported by the presence of perimortem fractures.

**Kolpan, Katharine (University of Idaho) and Nicholas Passalacqua (Western Carolina University)**

[38]

*Forensic Archaeology Fieldwork as a High-Impact Practice*

This presentation will discuss search and recovery efforts concerning an isolated, World War II-era burial from the Federal Republic of Germany. This was a project partnership between the Defense POW/MIA Accounting Agency (DPAA) and Western Carolina University (WCU), coordinated between DPAA, WCU, and various local officials. This presentation will provide a model for reimagining other, similar DPAA partnership projects as service learning and professionalization opportunities. The goal of this presentation is not only to summarize the findings of these search and recovery efforts but also to discuss the power of such collaborative projects as unique service learning, high-impact practices (HIPs). HIPs are educational practices that emphasize learning through practice and reflection, and have been demonstrated to have positive associations to student learning and retention. Service learning projects are defined by their experiential learning emphasis, combined with collaboration between community partners and participant reflection. The very nature of this collaborative partnership project provided the basis for its service learning structure. However, we argue this model also emphasized an atmosphere of professionalization not always encountered in field school contexts. This was because it allowed for student participants to take greater ownership of their work while being compensated as paid professionals.

**Kolpan, Katharine (University of Idaho)**

[161]

*Moderator*

[161]

*Discussant*

Konsitzke, Charles [38] see Jamison, Gregg

**Kooiman, Susan (Southern Illinois University, Edwardsville) and Aaron Comstock (Indiana University, East)**

[105]

*Environmental, Social, and Culinary Relationships in the Northern Great Lakes*

Indigenous culinary and pottery traditions were in flux during the Woodland and Late Precontact periods (200 BC–AD 1600) of the Northern Great Lakes. Shifting social relationships are indicated by changing pottery distributions and the increasing stylistic influence and presence of nonlocal wares, particularly Iroquoian styles from Ontario. Changes in local resource selection and cuisine have also been observed through multiple lines of evidence, including food residue analyses, functional pottery analysis, settlement pattern-resource catchment spatial survey, and ethnobotanical and faunal data. The Living Blended Drought Atlas provides fine-grained data on past moisture availability, allowing us to identify key periods of stress and abundance that could impact food availability and distribution, as well as broader lifeways and movements of local groups. The nature and timing of rainfall fluctuations in northern Michigan between AD 750 and 1500 are compared to dietary and ceramic stylistic patterns of contemporaneous occupations of the Cloudman site (20CH6), located on Drummond Island, Michigan, in Lake Huron. The results inform the complex relationships between environment, foodways, and social interactions and movements on the northern fringe of the Midcontinent.

**Koons, Michele (Denver Museum of Nature & Science)**

[75]

*Discussant*

**Koontz, Rex (University of Houston)**

[122]

*Classic Veracruz Sculptures and Bodies in Fragments*

As part of a larger study on Classic Veracruz fragmented bodies and sculptures, I sketch two case studies of contexts in which fragmented yokes, decapitated heads, and figurine body fragmentation come together in Protoclassic and Early Classic Tres Zapotes and Cerro de las Mesas.

**Kornfeld, Marcel (PIRL, University of Wyoming) and Mary Lou Larson (University of Wyoming)**

[126]

*Ruthann Knudson: Colleague, Friend, Mentor, and Much More*

Ruthann Knudson's career in archaeology began with work on midwestern ceramics in 1963 at the University of Minnesota and spanned nearly six decades. During that remarkable time, she taught at academic institutions; engaged in contract archaeology, much research focused on Paleoindians and lithics; surveyed, excavated, and analyzed material from throughout North America; coordinated Native American consultations; developed public museums; lobbied for archaeology at the national level; mentored students and colleagues; and much more. In this presentation I illuminate some of Ruthann's contributions to archaeology.

[126]

*Chair*

Kornfeld, Marcel [126] see Larson, Mary Lou

Kornfeld, Marcel [126] see Lynch, Elizabeth

**Kosiba, Steve (University of Minnesota)**

[123]

*Discussant*

Kosiba, Steve [182] see Chase, Zach

**Kosyk, Katrina (McGill University)**

[84]

*Sound Practices in Late Postclassic to Early Colonial Tlaxcallan: Applying a Community of Practice Framework to Investigate Sonic Expression*

In archaeological interpretations of Postclassic period central Mexico, sound practices and related assemblages are often conceptualized as unchanging, standardized, and fixed to a common Mesoamerican religious system under the umbrella of Aztec cultural expression. This neglect of other polities' sound traditions assumes a shared sonic experience and sensorium common across distinct communities from varying ethnolinguistic groups and time periods. However, given evidence for political turmoil and balkanization, population mobility, and prominent cultural and technological changes in the Late Postclassic and early colonial periods, there would be a great deal of patterned variability in the manufacture and use of sound-related material culture attributed to various communities of practice (CoP) and communities of engaged performance (CEP). Considering how CoP- and CEP-sonic expressivity could have been affected by transculturation, we might observe organological differences, changes in performance, and specific rhythmic structures, as well as a shift in the consumption of sound-related material culture and sound referents over time. I apply this framework to Late Postclassic to early colonial period Tlaxcallan (modern-day Tlaxcala), in the Puebla-Tlaxcala valley. The Tlaxcalteca were one of the few polities resistant to Aztec imperialism, and they allied with the Spanish during the conquest of Mexico.

**Kotegawa, Hirokazu (Universidad Nacional Autónoma de Honduras)**

[107]

*Esculturas monumentales como herramientas políticas en la sociedad olmeca: Una perspectiva desde el sitio Estero Rabón*

Las esculturas olmecas muestran un alto desarrollo estético desde su aparición. Sin embargo, estas esculturas no fueron sólo obras del arte sino también tenían una gran importancia socio-económica en la sociedad olmeca. Por ello, se piensa que estas esculturas monumentales fueron distribuidas por las elites olmecas. El sitio arqueológico Estero Rabón se encuentra en el sur de la costa del Golfo de México. Apareció jugando un papel importante como uno de los centros secundarios de la capital olmeca San Lorenzo y también posiblemente mantenía misma importancia de La Venta durante la época de la cultura olmeca. En este sitio se han encontrado ocho esculturas olmecas de gran tamaño y en distintas formas. En el presente estudio se intenta buscar la función de estas esculturas de Estero Rabón a través de la comparación de las formas y/o de los temas representados con otros sitios olmecas.

**Kotis, India (Kenyon College)**

[47]

*Writing on the Wall: Patterns of Discourse in Undergraduate Graffiti*

This research examines 2,400 samples of desktop graffiti (pictures or words that are drawn or etched into the wood of a writing desk) collected from a liberal arts college study space in Ohio, establishing chronology when possible. Much of what is written in the graffiti approximates patterns of discourse on social media websites like Reddit and Twitter. I therefore use archaeological theories of permanence and materiality to probe why modern college students, as digital natives, choose to express themselves on material surfaces when they can easily express the same things online. Many graffiti samples follow a similar pattern: A central phrase or drawing ("locus"), and one or multiple "answers" to that locus. These answers can take the form of words or sentences responding to the locus via arrows, as well as revisions of the locus itself. Revisions usually either reify or change the meaning of the locus, and provide evidence of the uncensored sociopolitical values held by the student body. We conclude that students engage in desktop graffiti to cultivate an uncensored community. Because it is anonymous, desktop graffiti affords a space for frank expression of the taboo, whether that is vulgar sexuality or unpopular politics.

Kovacevich, Brigitte [136] see Callaghan, Michael

Kovacevich, Brigitte [171] see Crawford, Dawn

Kovacevich, Brigitte [67] see Palacios, Horvey

Kovacevich, Brigitte [2] see Whyte, Rachel

Krasinski, Kathryn [21] see Holt, Evan

Krause, Johannes [182] see Nelson, Elizabeth

**Krause, Samantha (Texas State University), Timothy Beach (University of Texas, Austin), Sheryl Luzzadder-Beach (University of Texas, Austin) and Eleanor Harrison-Buck (University of New Hampshire)**  
[80]

*Geoarchaeological Investigations of Wetlands and Waterways in Crooked Tree, Belize*

The lagoon system around the island of Crooked Tree in northern Belize provides a compelling hydrological landscape with a strongly seasonal flood regime. The area also presents evidence of long occupation and use by the Maya. Our ongoing investigations include geoarchaeological testing within a series of linear cultural features within the Western Lagoon. In addition, we conducted sediment coring within nearby perennial marshes. The linear canal features within the lagoon, first reported by Pyburn in 2003, and later expanded on by Harrison-Buck in 2014, extend 600–800 m east–west across the lagoon and may have served to regulate annual floodwaters in the lagoon. This lagoonal system holds research promise for a variety of reasons, and may help to answer questions regarding Maya landscape modification, hydrological engineering, subsistence strategies, and cultural resilience/response to environmental changes. Here we present on preliminary geochemical, paleoecological, and chronological results from the 2019 field season from the wetland coring and key test excavations in the canal features of the Western Lagoon. Results from our ongoing analyses will provide robust information on hydrologic and geographic landscape patterns as well as human use of wetlands during cultural transitions.

Krause, Samantha [80] see Flanagan, Kelin

**Krempel, Guido (University of Bonn)**

[154]

*Venerating Death and Fertility: Implications of Late Terminal Classic Maya Use of Monuments with Skeletal Imagery*

This paper focuses on specific attestations found on Maya monuments featuring human skeletal iconography and to the concave round depressions used in place of their skulls. Such characteristic representation on monuments is mostly limited to the Maya Puuc region of the western Yucatán Peninsula where it appears to be temporally restricted to the Late Terminal Classic period. Given the chronologically as well as geographically limited distribution of such monuments with concave depressions and skeletal imagery with seemingly no explicit antecedents in the Maya area, the question arises whether these local traditions were rooted in or otherwise influenced by non-Maya cultures of the broader Mesoamerican cultural sphere. This study examines the possible function and use of such monuments exhibiting skeletal iconography by comparing materials with similar concave depressions used as depositories for certain sacrificial offerings in the context of death and fertility symbolism related perhaps to a ritual reenactment of a Central Mexican creation myth.

**Krigbaum, John (University of Florida)**

[161]

*Discussant*

Kriss, Dawn [133] see DeLeonardis, Lisa

Krupa, Krystiana [88] see Beisaw, April

**Krus, Anthony (University of South Dakota), Edward Herrmann (Indiana University, Bloomington), Christina Friberg (Indiana University, Bloomington), Dru McGill (North Carolina State University) and Jeremy Wilson (Indiana University-Purdue University Indianapolis)**

[97]

*The Timing of the Angel Polity: A Regional History from Site-Scale Chronology*

The Angel polity, located within the northeast Mississippian (AD 1000–1500) frontier, consisted of a network of hamlets and villages along the Ohio River, encompassing ~800 km<sup>2</sup> in southwestern Indiana. In this paper, we present 22 new radiocarbon measurements from archaeological samples that provide dates for occupations, earthwork construction, and diagnostic ceramics from the region's multi-mound center, Angel Mounds (12Vg1). Ninety-two radiocarbon measurements from archaeological samples have been obtained from the site, providing a robust sample and absolute chronological data regarding the timing of Mississippian activity. Angel Mounds contained civic and ceremonial earthworks, fortifications, and plazas likely built for the regional population; therefore, these chronological data provide crucial insights into polity-wide social and population dynamics. We present a Bayesian chronological framework to estimate the timing of the built environment, diagnostic ceramic handles, and occupations at Angel Mounds, while revisiting ideas about the site and regional history. We also review recent paleo-hydrological data used to derive precipitation history in the North American mid-continent to explore potential relationships between community reorganization and hydrological change during the Medieval Climatic Anomaly and onset of the Little Ice Age. Finally, we compare our modeling results to the absolute chronological data from neighboring sites and regions.

**Krus, Anthony (University of South Dakota)****[130]***Chair*

Krus, Anthony [179] see Alix, Claire

Krus, Anthony [130] see Rieth, Timothy

Krysl, Petr [1] see Morris, Margaret

Kuehn, Stephen [52] see White, John

**Kuijt, Ian (University of Notre Dame) and Arkadiusz Marciniak (Adam Mickiewicz University, Poznan, Poland)****[168]***How Many People Lived in Early Villages? Reconsidering Neolithic Demography at Çatalhöyük*

Archaeologists have divergent options as to how many people lived at different Neolithic villages. Near Eastern Neolithic settlements have been historically interpreted as being occupied by thousands of people. This interpretation is founded on several observations: that excavations at settlements often reveal the remains of the densely packed mud-brick buildings, at times with buildings being reconstructed multiple times, and that settlements are defined by deep stratigraphic deposits with some degree of continued use. The frequency and tight packing of buildings is of course familiar to archaeologists living today, for both visually and spatially this pattern echo's our personal experiences within urban contexts of confined space, restricted access, and bounded social worlds. The most contested issue at Neolithic villages, however, is how to best estimate population levels, and how long people lived in individual buildings. Revisiting the hitherto dominant picture of the mound occupation and employing the Bayesian modeled estimates of the length of individual house use, we argue that at any one time between 1,200 and 1,800 people were living on the mound of Çatalhöyük rather than 3,500–8,000 people, as proposed by Cessford (2001). The evolutionary development of Neolithic villages is reconsidered vis-à-vis these revised estimates.

**[168]***Chair*

Kuikuro, Afukaka [66] see Schmidt, Morgan

**Kulick, Rachel (University of Toronto), Kevin Fisher (University of British Columbia) and Francesco Berna (Simon Fraser University)****[191]***Geoarchaeology of Terraces and Building XVI at Kalavassos-Ayios Dhimitrios, Cyprus: Evidence for Site Formation and Settlement Activity*

Geoarchaeological research conducted in 2019–2020 as part of the Kalavassos and Maroni Built Environments (KAMBE) project focused on collecting multiscalar and high-resolution geoarchaeological data from the Late Bronze Age city of Kalavassos-Ayios Dhimitrios in south-central Cyprus. The aim of the geoarchaeological project is to determine the uses of space in and around the city's structures and activity areas as well as to connect site formation processes with social activities and environmental transformations occurring in the surrounding landscape. This paper discusses the results from two key aspects of this geoarchaeological research: (1) the investigation and coring of field terrace systems surrounding the site, and (2) the thin section micromorphological analyses of floor context samples from Building XVI. The results demonstrate how multiscalar, high-resolution geoarchaeological and environmental data, examined in conjunction with archaeological contexts revealed by ongoing and previous excavations, can contribute to understanding the structure and transformation of this major urban center in its broader socio-environmental landscape.

**Kurnick, Sarah (University of Colorado, Boulder)****[152]***Photographing the Ancient Maya*

Photography is a ubiquitous part of our daily lives and a pervasive feature of archaeological practice. For over a century, photographs have fostered interest in archaeology and offered a means to document artifacts, sites, and excavations. Perhaps because of its prevalence, archaeological photography is often taken for granted and only occasionally examined critically. Yet producing images of other peoples, places, and things is a challenging and often fraught endeavor. At first glance, photographs may appear objective even though they are subjective. And, they may seem to document something already present rather than create something novel. This presentation will consider the history of archaeological photography in the Maya area and specifically how photography has influenced our understanding of the Maya. How have explorers and archaeologists photographed Maya peoples, places, and artifacts? Have our photographic techniques changed over time? And how, if at all, has photography of the ancient Maya affected contemporary Maya peoples?

Kwon, Youngsang [77] see Sherman, Simon

Labrada Ochoa, Marcos Octavio [149] see Castro-Priego, Manuel



**Lacan, Melanie (University at Buffalo)****[174]***Monumental Nature and Natural Containers: Caves as Ideal Loci for Ritual Action*

The utilization of subterranean spaces by humans is cross-temporal and cross-regional. In turn, and sometimes simultaneously, caves have been employed around the world as seasonal or permanent shelters, storage rooms, workshops, burial chambers, and as containers for artistic and ritual actions. In southern France, these last endeavors have been the focus of research by generations of Paleolithic specialists. Thus, in this region best known for its parietal art, investigations have rarely centered on cave occupation during later Prehistory. Yet, caves were employed repeatedly well into the protohistoric and historic periods. This paper discusses the utilization of southern French caves during the Late Bronze Age and Iron Age and presents several examples of ritual deposition of artifacts. It is argued that, although unmarked and apparently hidden from view, caves were employed by some Iron Age communities as natural monuments and were a known and important part of their broader ritual landscape. The utilization of caves was not evidence of lasting "primitive" or alternate religions, and caves were instead a common choice for ritual deposition. They coexisted with larger built sanctuaries, not as competitive locations, but as complementary ones.

**La Chioma, Daniela****[84]***An Interdisciplinary Proposal for the Study of Sound and Music in Moche Art: The Case of the Afterlife/Underworld Dances (Dance of the Dead)*

In Moche art, archaeological evidence related to sound and music can be found in cultural materials from sculptured bottles to the notorious fine-line paintings. Sound-producing instruments, musicians, and musical performances have been featured worldwide in museum expositions and scholarly discourse about the Moche over the past four decades. One of the prominent thematic narratives given interpretative attention in Moche discourse is the Afterlife/Underworld Dances, where skeletons dance and play flutes in the world of the dead (*hurin* in the Andean ontologies). Morphological and iconographic variations in material cultural representations led me to establish five different sub-themes, which indicate chronological and regional idiosyncrasies in the production and distribution of this theme across the different valleys occupied by the Moche on the north coast of Peru. Here, I propose a methodological approach based on the convergence of visual semantics and ethnomusicological data, to examine ontological aspects of Moche sound production, such as the roles of flutes in rites of passage to the afterlife.

Ladefoged, Thegen [131] see McCoy, Mark

Ladrón de Guevara, Sara [107] see Bernard, Henri

**Lagle, Susan (University of California, Davis), Laura Niven (Annual Reviews) and Teresa Steele (University of California, Davis)****[33]***Updating and Reevaluating Faunal Datasets from Quina Mousterian Levels at Jonzac and Pech de l'Azé IV by Incorporating Screened Materials*

Logistical challenges of managing large zooarchaeological projects mean that researchers must often conduct faunal analyses in phases and implement sampling strategies, including studying subsamples that do not fully incorporate screened materials. However, screened portions may contain specimens that can provide depth to studies of species abundance and prey selection and transport but are underrepresented in the plotted portion due to size cut-offs: small foot bones, bones from small animals, fetal bones, and deciduous teeth. We present data generated from the screened portions (5–25 mm) of the Jonzac Level 22 and Pech de l'Azé IV Level 4a Quina Mousterian-associated, highly reindeer-dominated faunal assemblages to supplement Niven et al.'s (2012) and Niven and Martin's (2018) original datasets, which they generated using only the piece-plotted (>25 mm) portions of the assemblages. To address questions about incorporating screened materials in studied faunal samples, we examined the differences between the plotted and screened datasets and between the plotted only (original) and combined plotted and screened (updated) datasets. We then reevaluated Niven et al.'s (2012) and Niven and Martin's (2018) conclusions of these assemblages regarding species representation, sample preservation, prey selection, and carcass transport and processing.

**Lagos, Samantha (Southern Methodist University)****[43]***Where My Ladies At? The Fight to Erase the Gender Gap in Publication*

Feminist scholars have observed the gender disparity in archaeological knowledge production since the 1980s. Since then, both broad, discipline-wide, and smaller regionally focused studies have repeatedly demonstrated the same pattern of male-dominated publication trends. The lack of diverse voices in archaeological research has implications for the questions we ask, types of stories we tell, and ways in which we interpret the past. But, how will we be able to tell when archaeology reaches parity in recognition for the work of women? Will progress come slowly and steadily or be rapid and episodic? I examine several regional journals and conferences centered on Polynesian archaeology to identify the rate of improvement, or decline, in erasing gender disparities over time. I also consider how the mounting pressure to increase individual citation metrics and publication statistics placed on researchers by universities may inform on future publication trends in this space.

Lalo Jacinto, Gabriel [136] see Paris, Elizabeth

Lamb, Angela [94] see White, Chantel

**Lambert, Shawn (Mississippi State University), Timothy Perttula and Nilesh Gaikwad**

**[51]**

*Production Matters: Organic Residue and Iconographic Evidence for Late Precolumbian Datura Making in the Central Arkansas River Valley*

Recent absorbed residue studies have confirmed that ceramic and shell containers were used for consuming Datura in precolumbian times. Until now, no one has identified what tools precolumbian people used to produce a concentrated hallucinogenic concoction. In this study, we used mass spectrometry to identify Datura residues (a flowering plant with hallucinogenic properties) in two late precolumbian composite bottles from sites in the Central Arkansas River valley. Unlike the construction of most Mississippian bottles, the bottles in this study are unique because ceramic disks with a series of concentric perforations were incorporated in the bottles at the juncture of the bottle neck with the globular portion of the body. The organic residue analysis revealed Datura residues in both bottles and iconography suggests Datura-specific representations. We argue that the internal clay disks served as strainers that allowed Datura producers to separate the hallucinogenic alkaloids from the Datura flower to produce a powerful liquid beverage.

**[51]**

*Chair*

**Lambert, Shawn (Mississippi State University)**

**[75]**

*Discussant*

Lambert, Shawn [81] see Colaninno, Carol

Lamothe, Michel [34] see Forget Brisson, Laurence

**Lamoureux St-Hilaire, Maxime (Davidson College)**

**[188]**

*Moderator*

**Landa, Yesenia (CSU, Dominguez Hills) and Kenneth Seligson**

**[22]**

*GIS Modeling of Precolonial Maya Natural Resource Management Strategies during Major Climatic Changes*

This project analyzes the water management systems of a smaller Puuc community, tentatively labeled Site A that was recently identified using lidar (light detection and ranging) technology. This region is distinctive for having no natural surface water features. Precolumbian Puuc communities captured rainwater during the wet season in chultuns (underground storage chambers carved out of the limestone bedrock). Prior studies of Puuc communities have focused almost exclusively on larger sites in the region. Population estimates and water management strategies at smaller Puuc Maya communities are still largely unknown. I have used lidar data, QGIS (Geographic Information Systems) software, and available models for chultun capacity to (1) estimate the total water storage capacity for the chultuns of Site A, (2) estimate the population of the site, and (3) determine whether the chultuns alone were sufficient to support the population during the annual dry season and climatic changes such as droughts. Watershed areas were mapped to see if other water management strategies were employed, such as seasonal surface reservoirs or artificial ponds. Terrain profiles were assessed to see if the depth of potential pooling areas could have been used as seasonal pools.

**Landazuri, Heather (University of Maine, Orono) and Daniel Sandweiss (University of Maine, Orono)**

**[6]**

*New Kid on the Block: El Niño-Modoki in Peru—Past, Present, and Future*

During the climatological phenomenon referred to as El Niño Modoki, warm sea surface temperatures (SSTs) in the central Pacific are flanked on the east and west by cooler SSTs. Over the last century, El Niño-Modoki has increased in frequency, but a long-term sequence has yet to be established prior to the last four centuries. At least on the north coast of Peru, El Niño-Modoki is associated with reduced river discharge resulting from lower precipitation and/or temperature in the adjacent Andes mountains. Much paleoclimatological and archaeological research has focused on the effects of canonical El Niño along the Peruvian coast; however, almost no attention has been paid to El Niño-Modoki in this region even though the associated reduction in water flow must have a major, recurring effect on the irrigation-based societies that inhabit the area. Considering the societal and environmental gravity of ENSO phenomena, improving our understanding of previous events is essential not only to anticipating them, but also to mitigating their effects on human populations. In this poster we present the paleoclimatological research potential of El Niño Modoki on the northern coast of Peru with specific focus on potential proxy sources, prehistoric adaptive strategies, and modern applications.

Lane, Brian [133] see Lentz, David

Langford, Theresa [183] see Wilson, Douglas

Langis-Barsetti, Dominique [191] see Bowland, Lucyna

Langlais, Mathieu [77] see Sánchez de la Torre, Marta

**Langlie, BrieAnna (Binghamton University), John Wilson (Center for Advanced Spatial Technologies, University of Arkansas) and Jacob Frank (Binghamton University)**  
[131]

*Finding Terraces in the Lake Titicaca Basin, Peru*

Driving through the Lake Titicaca basin of southern Peru travelers are often struck by terrace covered hillsides rising from the plain. Nearly every hillside encountered has been transformed from steep faced rocky hillsides into arable land. These ancient fields were constructed and farmed millennia ago to help farmers adapt to the high-altitude, arid ecosystem, an ever-oscillating climate, and dynamic cultural regimes. However, very little is known about the extent of these terraces, when they were built, or who built them. The vast extent might be one of the reasons why terraces have not been systematically studied in the region. In this paper, we discuss producing an integrative GIS database to (1) locate and examine the extent of agricultural terrace complexes, (2) associate terrace complexes with known archaeological sites, and (3) characterize terrace typologies as visible from satellite data. Remote sensing allows us to quantify and characterize terraces in a way that is not possible from terrestrial survey methods.

**Langlitz, Meredith (Archaeological Institute of America) and Ben Thomas (Archaeological Institute of America)**  
[193]

*Is There a Place for Mock Digs in Archaeological Outreach?*

Mock digs have been a staple of archaeologically themed outreach for years but also an area of growing concern for professional archaeologists with expertise in public education. The activity is discouraged by some because it is suggestive of treasure hunting and emphasizes digging in a field that is so much more than that. While concerns about mock digs are valid, is it practical or prudent to discourage the activity? Can these energies be redirected? This paper shares the results of a survey conducted by the Archaeological Institute of America about attitudes and approaches to mock digs and explores practical responses to this ubiquitous exercise.

Lanier, Hayley [72] see Rayfield, Kristen

**Lanos, Philippe (CNRS [IRAMAT-CRP2A]) and Philippe Dufresne (CNRS [IRAMAT-CRP2A])**  
[97]

*A New Bayesian Approach for Estimating Chronological Events and Phases with ChronoModel*  
[WITHDRAWN]

Lanos, Philippe [97] see Banks, William

**Lapp, Jennifer**

[160]

*Moderator*

**Lara, Catherine (Instituto Francés de Estudios Andinos)**

[69]

*Los Tallanes y su entorno regional entre 500 y 950 dC: Algunas reflexiones desde la tecnología de la cerámica paleteada y sus contextos*

Los pocos datos existentes sobre el origen de los Tallanes provienen esencialmente de la etnohistoria, según la cual este grupo estaba inicialmente asentado en los Andes, desde donde habría migrado hacia la costa norte bajo la presión de grupos amazónicos. Desde la arqueología, la "aparición" de los Tallanes (500 dC hipotéticamente) coincide asimismo con el fenómeno regional de la intensificación de las interacciones entre las sociedades asentadas entre el actual norte del Perú y sur del Ecuador, en especial en torno al Spondylus. En lo referente a la alfarería, la cerámica paleteada es predominante en los contextos arqueológicos tallanes. No obstante, este tipo cerámico rebasa ampliamente el área tallán. ¿Por qué se difundió esta cerámica de manera tan masiva? Cleland y Shimada (1994) han propuesto un modelo sobre el éxito del "fenómeno paleteado" para la ocupación Lambayeque de Batán Grande. ¿Qué sugerirían los contextos coetáneos y de otras épocas de los valles aledaños? ¿Qué nos indica aquello sobre el tipo de relación entre los Tallanes y sus "vecinos" en el tiempo y el espacio? La presente intervención se propone reflexionar sobre estas preguntas a partir de una mirada tecnológica en torno a la cerámica paleteada y sus contextos.

**Larios, Jennifer (University of Michigan), Jacob Bongers (University of East Anglia), Jordan Dalton (American Museum of Natural History), Jo Osborn (University of Michigan) and Camille Weinberg (University of Texas, Austin)**

[128]

*The Pottery of Chincha Revisited*

Recent studies on the late prehispanic periods in the Chincha Valley, Peru, have enabled scholars to obtain a better understanding

of the Chincha Kingdom. However, the pottery of Late Intermediate period and Late Horizon Chincha Valley has received little attention since the Dorothy Menzel's critical studies in the 1970s. This study aims to expand our knowledge of Chincha ceramics by revisiting recent analyses on a sample of Chincha pottery that spans various contexts and numerous sites throughout the Chincha Valley.

**Larson, Kara (University of Michigan)**

[129]

*Meat on the Hoof: Isotopic Evidence of Administrative Herd Management at Khirbet Summeily, Israel*

Khirbet Summeily is an Iron Age II site located northwest of Tell el-Hesi in Southern Israel. Excavations have revealed a large, singular structure with an adjoining ritual space dated to the Iron Age IIA (ca. 1000–870 BCE). Recent interpretations suggest the site was integrated into a regional economic and political system and functioned as a potential administrative outpost based on the material culture and architecture recovered from the Iron Age IIA layers. This paper presents the carbon, oxygen, and strontium isotopic analyses of intra-tooth samples from ovicaprine and cattle remains to test herd management strategies in connection to administrative provisioning activities. The animal remains are used as proxies to identify political and economic ties through shared foodways and herd management patterns. Results suggest direct evidence of goats herded in the Egyptian Nile Valley prior to arrival in the southern Levant. This is the first evidence of Egyptian livestock trade in the Greater Hesi Region during the Iron Age IIA. Implications from this research address herd management and mobility patterns as well as the level and identity of the larger political network the site was integrated into, thereby testing the hypothesis that Khirbet Summeily was an administrative outpost.

**Larson, Mary Lou (University of Wyoming) and Marcel Kornfeld (University of Wyoming, PiRL)**

[126]

*Hell Gap and Its Changing Roles*

Hell Gap site excavations began in 1959; however, the bulk of the investigations occurred between 1962 and 1966. This was early in Ruthann Knudson's archaeological career, but the site left a lasting impression on her, as it did on others, and she returned to write a chapter in the first monograph on Hell Gap. The second round of investigations began in the early 1990s with a substantially different focus. Rather than chronostratigraphy, which remained an important question, the focus shifted to site formation, site structure, and the myriad of questions on subsistence, mobility, and technology. In this presentation we focus on the recent results.

[126]

Chair

Larson, Mary Lou [126] see Kornfeld, Marcel

Larson, Mary Lou [126] see Lynch, Elizabeth

**Lash, Ryan (University of Notre Dame)**

[123]

*Cult and Cultivation: Vulnerability and Resilience on Inishark Island, Co. Galway, Ireland in the Nineteenth Century*

Critics of new materialism caution that focus on the active qualities of materials and the distributed agency of assemblages obscures the cruelties of inequality that allow the powerful to do as they will and others to suffer what they must. Engaging such critiques, this paper examines the famines in nineteenth-century Ireland as a political-ecological catastrophe about which an assessment of the role of human (landlords, government officials, tenant farmers) and nonhuman actors ("the blight," the lumper potato, marginal landscapes) carries considerable political stakes. Drawing on archaeological and archival data from the island of Inishark, I suggest that attending to the subsistence, sensory, and mnemonic affordances of diverse materials in the landscape actually highlights islanders' creative agency in maintaining collective identity, action, and livelihood in the midst of adversity. I argue that islanders' curation of medieval ritual monuments and annual commensal celebrations associated with the cult of Saint Leo generated a shared heritage that reinforced the social bonds required by their community's collective agricultural regime. New materialist approaches can therefore nuance understandings of vulnerability and resilience by exploring how humans operate within material assemblages that afford and constrain patterns of subsistence, lived-experience, and social affinity and difference.

**Lassen, Robert (AmaTerra Environmental Inc.), Brittany McClain (AmaTerra Environmental Inc.) and Timothy Griffith (AmaTerra Environmental Inc.)**

[96]

*Excavations at the Crane Dune Site (41CR61), a Prehistoric Habitation, Burial, and Lithic Cache Site in Crane County, Texas*

The Crane Dune site (41CR61) was identified by AmaTerra archaeologists during a survey for the Texas Department of Transportation (TxDOT) prior to widening Highway 385 in Crane County, Texas. The site consists of at least two components (Late Prehistoric and Late Archaic) centered on stabilized sand dunes. The cultural occupations span a 40–50 cm thick dark anthrosol layer consisting of charcoal-stained sandy sediments, suggesting intensive occupation. Excavations focused on exposing and recording features, which consisted primarily of rock-lined ovens in shallow basins, as well as deeper cooking pits without rocks. Additionally, one feature was made up of a cached assemblage of over 50 flake blanks and a Marshall dart point. Finally, two pit features consisted of human burials containing extremely deteriorated remains as well as grave goods consisting of bone beads, bone and turquoise pendants, and lithic tools. General artifacts include dart and arrow points, occasional groundstone and ceramic sherds, chert and quartzite debitage, at least two obsidian flakes, and faunal material ranging from rodents to bison. The Crane Dune site continues to provide a wealth of archaeological data in an under-studied region of Texas. Analysis is currently ongoing, and this paper will present the latest results of the project.

Latorre, Claudio [114] see Ugalde, Paula

**Lattanzi, Gregory (New Jersey State Museum)****[134]***Discussant***Lattanzi, Gregory (New Jersey State Museum)****[183]***The Good, the Bad, and the Not So Great: Archaeological Curation at the New Jersey State Museum*

Unlike most state museums, the New Jersey State Museum operates directly under the Department of State, and this has its advantages and disadvantages. On the one hand, we enjoy interacting with the public through programming, exhibitions, research, presentations, and publications. On the other hand, budget cuts, reduced staff, and leadership changes potentially every four years puts tremendous strains on the professional staff. As curator and state archaeologist, my position is to care for New Jersey's cultural resources, direct the state's NAGPRA compliance, and maintain the site registration program. The position of state archaeologist is not mandated by the legislature—it is technically a variant of the curator state title. It is hard to keep up with the amount of material generated by cultural resource management, as well as having to put up exhibitions and maintain the site registration program. This presentation lays out many of these and other issues faced by the Bureau of Archaeology and Ethnography at the New Jersey State Museum, and how to the best of my and others ability we try and navigate them.

**Lau, George (Sainsbury Research Unit, University of East Anglia)****[69]***Discussant*

Lau, George [159] see Chicoine, David

**Laugesen, Jason (Humboldt State University), Marisol Cortes-Rincon (Humboldt State University) and Ravyn Torres (Humboldt State University)****[22]***Geospatial Analysis of Material Culture in the Hinterlands in Northwestern Belize*

The Belize archaeology field school, Dos Hombres to Gran Cacao (DH2GC), has been active since 2009, gathering cultural remains from different excavations. Using ArcGIS, the excavations and associated ceramic artifacts can be used for geospatial analyses of human settlement, occupation, and trading patterns. The general goal of the project is to create a geodatabase of all of the artifactual remains excavated in the project area, which can be expanded with future project research. Data was collected in the field using tape and compass, GPS units, a total mapping station, and an aircraft for light detection and ranging (lidar). The implications of using an interdisciplinary approach of archaeology and geospatial analysis to study settlement patterns in ancient Mesoamerica include identifying new patterns and locating new settlements.

Laugesen, Jason [152] see Cortes-Rincon, Marisol

**Laugier, Elise Jakoby (Dartmouth College) and Jesse Casana (Dartmouth College)****[131]***Agricultural Landscapes of the Mesopotamian-Zagros Borderlands*

The Upper Diyala River Region in northern Iraq has long served as a strategic political, economic, and cultural borderland between the Mesopotamian alluvium and the Zagros Mountains. The region is also environmentally complex, encompassing a steep gradient of agroecological zones ranging from irrigated alluvial lowland plains to upland dry farming valleys and mountainous highlands. Thus, from the Neolithic onward, the Upper Diyala has presumably hosted a variety of agropastoral traditions. Yet only the most recent land use features, such as canals, field boundaries, and trackways, are easily resolvable in available satellite imagery. Coupled with regionally poor preservation conditions for macrobotanical remains, we are challenged by limited empirical data for understanding earlier periods of agricultural land use. As part of the Sirwan (Upper Diyala) Regional Project (SRP), this paper draws on a variety of complementary datasets at multiple scales—from historic aerial imagery to phytolith analysis—to systematically investigate this diverse and challenging agricultural landscape. Results demonstrate the necessity of integrated, multiscale approaches for addressing these preservation problems. Additionally, the paper discusses the critical importance of also understanding modern land use and the ongoing challenges of reconstructing ancient agricultural landscapes in rapidly developing, active agricultural zones.

Laumbach, Toni [37] see Whisenhunt, Mary

**Laurich, Megan (Northern Arizona University) and Chrissina Burke (Northern Arizona University)****[26]***Prehistoric Pets: An Examination of the Human-Dog Relationship in the American Southwest*

Dogs have been human companions for at least 15,000 years (Morey 2010), with some of the earliest remains recovered in North America from Danger Cave, Utah (Schwartz 1997). How the relationship has been and is now defined, however, varies culturally and temporally. This research explores the complexity of our relationship with dogs in an intermediate space between ritually significant and working animals, with specific focus to the impact humans may have had on dog health. Using faunal collections from the Museum of Northern Arizona, we evaluated healed cranial fractures and worn dentition from domesticated dogs. Methodologically previous researchers lacked formal systems for documenting these pathologies. When reviewing the literature (Allo 1971; Bartosiewicz 2013; Clark 1997) though, a new method for measuring the overall wear patterns was created. Using data

collected and reexamined for this project, we challenge the stereotyped assumption that prehistoric indigenous communities abused their dogs. Innovative data collection methods in zooarchaeology are still possible and have the potential to expand interpretations concerning the diverse interaction's humans have had with animals.

Laurich, Megan [26] see Gilmore, Eric

**Law, Zada (Middle Tennessee State University), Susan Knowles (Middle Tennessee State University) and Ken Middleton (Middle Tennessee State University)**

**[184]**

*The Archaeology of Citizenship: African American School Sites in Post-emancipation Tennessee*

A prototype visualization tool for a statewide historical geography of African American communities emerging in Tennessee's post-Civil War period is raising awareness and elevating visibility of the African American historic cultural landscape—both above and below ground—for cultural resource management as well as for students, educators, planners, and the general public. An important outcome of this digital scholarship project, which takes the form of a publicly available GIS-based story map supported by an on-line collection of primary sources, is the identification of post-emancipation African American school sites predating the Rosenwald School era. These early school sites can be interpreted both as expressions of formerly enslaved African Americans claiming citizenship through education and as signifiers of post-emancipation community formation. While the original school buildings are no longer extant, recognition of their archaeological presence adds temporal breadth to the body of African American archaeological sites recorded in Tennessee and may promote conservation in development or planning scenarios. Components of this research include fieldwork to meet with community historians, interrogating their research and additional primary sources through the lens of archaeology, sharing new insights with community partners, and developing a sustainable work product that others can use or build on.

**Lawler, Andrew (Science Magazine)**

**[73]**

*Discussant*

**LaZar, Miranda (University of Arizona) and Jonathan Dombrosky (University of New Mexico)**

**[91]**

*Tracking Individual Raptors in the Archaeological Record Using Stable Isotopes: Limitations, Possibilities, and Causes of Intraskelatal  $\delta$ -Value Variation*

The ability to track trade of socially valued goods made from raptor bones can give archaeologists a deeper understanding of both human-raptor interactions and networks of exchange. Reconstructing distribution of such goods from production centers, however, requires the ability to identify bones from an individual bird. We explore a method to track the trade of raptor remains by examining intraskelatal variation and interindividual separation of  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ , and  $\delta^2\text{H}$  from 20 modern Cooper's Hawks (*Accipiter cooperii*). Our study is supplemented by analysis of the stable isotope signature of soft tissues from these hawks. Soft tissues have different turnover rates, which allows us to assess the linkage between individual hawk feeding ecology and interindividual separation. Archaeologists may be able to reconstruct networks of exchange in the archaeological record with stable isotope analysis.

**Leal Hernandez, Edgar (DSA-INAH) and Jocelyn Salgado (DSA-INAH)**

**[63]**

*Hallazgos paleontológicos dentro de la construcción del nuevo Aeropuerto Internacional Felipe Ángeles*

En octubre de 2019, trabajadores de la construcción del nuevo Aeropuerto Internacional Felipe Ángeles (ubicado a 50 km al norte de la Ciudad de México), realizaron el reporte del hallazgo de unos huesos poco comunes. En ese momento, arqueólogos del Instituto Nacional de Antropología e Historia, así como personal del Ejército Mexicano, arribaron al lugar para verificar los restos óseos y comprobar que se trataba de un mamut. A partir de ese momento, se comenzaron las labores de rescate de paleofauna. Hasta el día de hoy, el grupo de arqueólogos/paleontólogos ha rescatado más de 220 especímenes correspondientes a mamut, camello, caballo y otras especies de aves, peces y fauna menor en los más de 200 puntos de hallazgo localizados a lo largo de la construcción del aeropuerto. Este depósito apunta a ser uno de los más grandes del mundo y el más importante de América Latina. En esta presentación, se mostrará un panorama general de los trabajos de salvamento de los restos paleontológicos, su distribución dentro de lo que fue el antiguo Lago de Xaltocan, una cronología relativa, así como sus procesos tafonómicos.

Leathem, Hilary [135] see Stoll, Marijke

Lebehn, Jason [83] see Ono, Rintaro

**LeBlanc, Megan**

**[16]**

*Quebrada Debris Flows, Hydrology, and Agriculture at Tacahuay Tambo*

This poster presents a survey of the debris flow deposits, hydrology, and agriculture at Tacahuay Tambo, a Late Intermediate (AD 1000–1476) site located on south coast of Peru. Quebrada Tacahuay in combination with the Tambo, has 12,000 years of cultural history. Therefore, there are numerous flood deposits that add to the complexity of the stratigraphy. Debris flows are especially impactful in this area when paired with tectonic events that loosen up existing rocky material. The Miraflores Event (fourteenth

century AD), was one of these major disasters that impacted cultural activity in this region. Deposits from this flood can be found in the Tacahuay quebrada. Using GPR techniques, sediment analysis, and GIS mapping of the hydrology of this drainage, I studied sediment deposition, drainage, and disaster management at this site. In addition, a survey using drone footage was used to locate agricultural terracing around to show the potential impact of flood events on the people who inhabited this area. This initial survey provides the geologic context for future excavations at Tacahuay to fully understand the relationship between environmental change and the Chiribaya people during the LIP.

Le Bourdonnec, François-Xavier [77] see Sánchez de la Torre, Marta

**Leckman, Phillip (Statistical Research Inc.)**

[49]

*Our Checkered Past: Sites, Landscapes, Trails, and Transect Recording Unit Survey*

For over 30 years, archaeologists in southern New Mexico have discovered and managed cultural resources in a survey setting using the transect recording unit (TRU) method. This survey approach divides survey space into a grid of uniformly sized cells and serves as the basis for recording all cultural manifestations observed across a study area. TRU survey strikes a balance between traditional site-based recording methods and site-less survey approaches, generating the site boundaries required by cultural resource management regulations while also providing a high-resolution spatial framework for fine-grained, landscape-scale analyses of survey data. In this paper, I provide an overview of the TRU survey approach while discussing both the research potential of the method and some of the issues and challenges it raises. These issues are explored via an examination of the use of TRU data for identifying and tracing precontact foot trails in New Mexico's Tularosa Basin. These trails, which are essentially invisible during pedestrian survey, are readily identifiable as linear patterns using landscape-scale TRU survey data derived from multiple survey projects, providing insight into precontact routes of movement and exchange.

**Leclerc, Elizabeth (University of Maine)**

[6]

*Giving Form to Flow: Modeling Paleohydrology in North-Central Coastal Peru*

In coastal Andean archaeology, long-standing interest in water and cultural dynamics is intensifying, especially with diminishing glacial water supplies in the coast's headwater regions. However, archaeologists who have hinged their hypotheses on the availability or management of water resources have frequently overlooked or disregarded the non-linear ways that past variability in upstream climate, land use, and water management influenced coastal water flows. Developing this broader context requires grounding in hydrologic principles beyond the expertise of most archaeologists but is imperative as research increasingly turns to the complex dynamics between social and hydrologic systems. I present a conceptual model for coastal paleohydrology that is generalizable to north-central Peru. I incorporate spatial and hydrologic techniques to operationalize portions of the model that are suitable for analysis with commonly available data for these valleys and their headwater regions: terrain data, modern and paleo climate records, and archaeological settlement and land-use patterns. Using the Supe Valley in the Late Preceramic period as a case study, I test various scenarios to evaluate how well current hypotheses for the mid-valley intensification of agriculture during this period account for the broader hydrologic contexts generated from the model.

LeCount, Lisa [136] see Blitz, John

**Lee, Lori (Flagler College)**

[184]

*Bottles and Beads: Glass Objects at Fort Mose*

[WITHDRAWN]

Lee, Lori [184] see Slatowski, Jenna

**Lefebvre, Karine (CIGA - UNAM)**

[71]

*Hacia un análisis arqueogeográfico de las dinámicas de las formas del paisaje*

En México, desde hace varias décadas, diversos proyectos analizaron los datos históricos enfocándose en cortes cronológicos establecidos a partir de procesos históricos específicos, con el fin de comprender las formas de apropiación y de explotación de un territorio por una sociedad en un momento dado. Este acercamiento proporciona información clave, pero no permite entender los procesos paisajísticos en su globalidad, puesto que los fragmenta. Es difícil ver cómo las formas preexistentes, heredadas de épocas anteriores, combinadas con nuevas estrategias, dieron origen a nuevos paisajes, porque si bien la transformación del paisaje es continua, sus componentes no mutan a un mismo ritmo. A partir de la confrontación de datos arqueológicos, históricos y cartográficos, reflexionaremos sobre la temporalidad múltiple de las transformaciones de los paisajes. Basándonos en el caso de Acámbaro durante el siglo XVI, se tratará de entender cómo las políticas socioeconómicas impulsadas por el poder español en sus "nuevos" territorios afectaron las formas y los modelados de los paisajes, con que intensidad y a que velocidad y así reflexionar sobre la complejidad de los fenómenos de herencia y de reestructuración constante en las dimensiones espaciales y temporales.

Lehner, Joseph [191] see Bowland, Lucyna

**Leighton, Mary (University of Michigan)****[81]***Performative Informality Hurts Everyone: Getting to the Root of Intersectional Inequalities in Archaeology*

This presentation will discuss subtle forms of intersectional inequality that arise when academic communities are conceptualized as friendship-based and egalitarian, rejecting explicit hierarchy. I have described this as “performative informality” and argued that it stems from a meritocratic ideology that inadvertently reproduces Euro-American white-male privilege. In a discipline that prides itself on its friendliness, openness, and alcohol-fueled drinking culture, those who find themselves unable to enact or perform informality appropriately are at a distinct disadvantage. Drawing from a multisited ethnography of Andeanist archaeologists, I have made the case that it is the ephemerality and plausible deniability of performative informality that makes it hard to recognize and thus mitigate against. This argument draws on and contributes to the theorization of gender discrimination in archaeology, studies of work and labor, and feminist Jo Freedman’s concept of “the tyranny of structurelessness.” In the spirit of ensuring our feminism does not inadvertently reproduce Euro-American white-women’s privilege, this presentation will explicitly focus on the intersectionality of discrimination in archaeology; namely, how performative informality holds back women, but also people of color, those from working class backgrounds, non-US archaeologists, and others who do not have “cultural fit” in North American archaeological communities.

Leishman, Deborah [46] see Pike, Jean

**Lemke, Ashley (University of Texas, Arlington)****[98]***Submerged Prehistoric Archaeology on the Atlantic Continental Shelf*

Given the last two million years of global fluctuations in climate and ocean levels, submerged landscapes are arguably the most important zone for addressing questions concerning human evolution and migration and are unique for their potential to preserve extraordinary evidence of prehistoric peoples. A discovery off the coast of North Carolina on the Atlantic continental shelf offers an exceptional new research locality, with a rock outcrop, mammoth bones, and a likely paleo-river channel preserved in 80 feet of water, 25 miles offshore. This raw material source may provide connections to Paleoindian sites on the mainland, and a locus of raw material, big game, and fresh water provides an ideal setting for prehistoric archaeological sites. Results from preliminary fieldwork are presented from the area around this discovery which offers an ideal laboratory for linking submerged landscapes to terrestrial ones and for methods development for prehistoric underwater archaeological research.

Lemke, Ashley [52] see Reynolds, Robert

**Lemly, Marina (University of New Mexico) and Keith Prufer (University of New Mexico)****[22]***A 5,000-Year History of Landscape Evolution in the Rio Blanco Valley of Uxbenká, Belize*

Archaic people and Classic period Maya played important roles in shaping their environments. Through early deforestation and later agricultural erosion humans have modified the world they lived in. This study aims to show the role the Maya had in the environmental change in their region. We report results of analysis of a 5,500-year-long profiles soil from over bank deposits along the Rio Blanco in Belize. We present the results from loss of ignition and  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  isotope analysis indicating gradual but steady human impacts on the landscape prior to the establishment of the Classic period polity and then accelerated impacts due to erosion associated with increasing agriculture after 100 CE.

**LeMoine, Genevieve (Bowdoin College)****[179]***Discussant***Lemonnier, Eva, Julien Hiquet and Julien Sion****[181]***Living in the City of Naachtun (Guatemala): A Perspective from Urban Neighborhoods*

Archaeological investigations carried out since 2011 at the site of Naachtun provide series of data useful to draw with sufficient details, the historical trajectory of this Maya Classic regional capital located between Tikal and Calakmul. Starting its development with the construction of public architecture from 150 CE, the city reached its demographic peak between 700 and 850—a period for which it is possible to discern neighborhoods on the basis of morphological, spatial, and chronological analyses. The paper will focus on these urban neighborhoods, particularly on their formation and growth in space and time as well as on people relationships within these units and between them. On the household and neighborhood scales, specific datasets documenting continuity/discontinuity and activities (occupational sequences, architecture and spatial layout, material culture, land-use pattern) allow us to discuss the role of social dynamics in shaping the city and their connections with the local political leaders’ strategies.

Lemonnier, Eva [104] see Arnauld, M. Charlotte

**Lentz, David (University of Cincinnati) and Brian Lane (University of Oregon)****[133]***Exudates and Resins Used by the Maya as Potential Candidates for Natural Bioactive Adhesives, Gums, and Protective Coatings*

Both the ancient and modern Maya have employed a broad range of plant exudates, gums, resins, and other natural products for many centuries. Numerous plant species indigenous to Mesoamerica possess bioactive compounds that have served as medicine,



pesticides, fish poisons, dyes, adhesives, unguents, tanning agents, incense, saponins, and other useful purposes. This paper will present data from ethnographic accounts and archaeological contexts from Aguateca, Cerén, Chan, Copan, Tikal, Yaxnohcah, and other ancient Maya sites. Plants to be discussed, all known archaeobotanically, will include *Acacia* spp., *Annona muricata*, *Brysonima crassifolia*, *Bucida buceras*, *Clusia flava*, *Enterolobium cyclocarpum*, *Hamelia patens*, *Hymenaea courbaril*, *Persea americana*, *Piper* spp., *Pouteria sapota*, and other plants. Most of these useful plants possess properties that are underutilized and have promise as natural adhesives, gums, resins, and protective substances in a broader range of applications.

**Lenzi, Michael (Kleinfelder), William Bloomer (Kleinfelder) and Zygmunt Osiecki (Sierra Army Depot)**

**[54]**

*Late Pleistocene/Early Holocene Occupations on the Sierra Army Depot in Honey Lake Valley, California*

Recent archaeological testing at three sites on the Sierra Army Depot in Honey Lake Valley recovered several Late Pleistocene/Early Holocene artifacts. Obsidian hydration rim measurements on tools and debitage display remarkably thick hydration rinds (~9.0–11.0 microns) and confirm very early occupations. Results of X-ray fluorescence sourcing reveal a relatively local interaction sphere that displays continuity through the Holocene with assemblages dominated by local basalt and northern obsidian sources. The location of the sites at an elevation of ~1,221.5 m could only have been occupied after a significant decline in Pleistocene Lake Lahontan water levels, and coincides with a GIS model that predicts a rapid expansion of wetland habitat when the lake reached that elevation. Radiocarbon dates on freshwater shell produced dates ranging from ~10,900 to 11,900 cal BP, and suggest a shallow marsh was present at that time.

León Santiago, Mayra [133] see Velasco Fuentes, Rocio

**LeRoux, Marie (University of Oregon) and Alison Carter (University of Oregon)**

**[29]**

*Spindle Whorls from Angkor Borei, Cambodia*

Angkor Borei, Cambodia was a major center of the Funan civilization during the early first millennium CE. As with many sites in Cambodia, Angkor Borei has also been heavily looted. This poster presents our analysis of 362 ceramic spindle whorls from a looted collection undergoing repatriation to Cambodia. We compared the collection to a previously developed typology of Southeast Asian spindle whorls by Judith Cameron, but also recorded multiple unique types that have not been previously identified. This poster presents these new types, which will also serve as a baseline for future studies in Cambodia and Southeast Asia. These spindle whorls suggest that textile production was an important component of life in prehistoric Cambodia.

le Roux, Petrus [125] see Uribe, Mauricio

Leroy, Stéphanie [150] see Hendrickson, Mitch

Levin, Anaïs [152] see Shaw-Müller, Kyle

**Levin, Maureece (Santa Rosa Junior College), Aimee Miles (Uppsala University) and Katherine Seikel (Australian National University)**

**[83]**

*Eating Pingelap: Archaeobotanical and Zooarchaeological Perspectives on the Settlement of a Micronesian Atoll*

Pingelap Atoll, located in central-eastern Micronesia, was colonized by 1550–1700 cal BP. Although these settlement dates are only a few hundred years later than those of nearby high islands such as Pohnpei and Kosrae, the environment presents notably different challenges and opportunities for subsistence. In this paper, we engage with archaeobotanical and zooarchaeological data to examine human-mediated landscapes and seascapes of the Pingelapese past, and the subsistence patterns that developed in the local human community. Ethnoarchaeological interviews and observation focusing on both farming and fishing inform the interpretation of this research, as horticulture and fishing continue to be an important part of subsistence for the modern Pingelapese population. Subsistence datasets show evidence for usage of a variety of local fish and shellfish over a long period of time, as well as sea birds, turtles, and introduced chickens. Coconut, pandanus, and several introduced plant taxa constitute important crops, and phytolith data demonstrate, long-term anthropogenic fertilization of soils.

Levine, Marc [102] see Hedgepeth Balkin, Jessica

Levinson, Judith [133] see DeLeonardis, Lisa

**Levy, Janet (UNC Charlotte)**

**[134]**

*Discussant*

Levy, Thomas [168] see Howland, Matthew  
 Levy, Thomas [29] see Liss, Brady

**Lewandowski, David (Logan Simpson)**

[37]

*Exploring Classic Period Mimbres Social Networks through Neutron Activation Analysis: A Pilot Study*

This poster presents the results of a study that uses the neutron activation analysis (NAA) dataset that has been compiled for 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. Previous SNA studies in the American Southwest have used ceramic wares to build ties between sites and have established a set of methods for creating and examining social networks. The use of NAA data to build social networks allows for these 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 examines differences in painted and utilitarian pottery networks, explores site centrality within the networks, and uses GIS to geographically represent the social networks across the Mimbres region. This study also demonstrates the applicability of the Mimbres NAA data for conducting SNA and presents future avenues of study and data needs for further examining social networks within the Mimbres region.

Lewis, Helen [150] see White, Joyce

**Lewis, Michael (The Confederated Tribes of Grand Ronde), Molly Casperson (US Army Corps of Engineers) and Amy Tadlock (US Army Corps of Engineers)**

[6]

*Environmental Effects of Cyclical Reservoir Drawdown on Archaeological Resources: A Preliminary Case Study from Fall Creek Reservoir, Lane County, Oregon*

The Willamette Valley Project of the United States Army Corps of Engineers (USACE) manages 13 reservoirs in northwestern Oregon. The USACE's flood control mission requires annual water level drawdowns that expose the reservoir bed to cycles of lacustrine deposition, wave-action, and alluvial and colluvial erosion. Previous assessments of the impacts of drawdown cycles on archaeological sites have categorized sites as above, within, and below the drawdown zone thereby conflating sites dominated by annual erosional and depositional processes. In this poster, we apply a new sediment transport model (Keith and Stratton 2019) to describe the drawdown impacts to cultural sites in Fall Creek Reservoir with greater precision than previous models permitted. Five zones are identified: (1) Uplands, (2) Littoral Floor, (3) Reservoir Slope, (4) Pelagic Floor, and (5) Deep Pelagic floor. By comparing surface assemblages, artifact distributions, and stratigraphy, we characterize the erosional/depositional effects, visibility, and stability of cultural sites within each zone. Implications for site management and survey methodology are discussed.

Lewis, Quinn [52] see Massey, David

Li, Zhanyang [141] see Doyon, Luc

**Liendo, Rodrigo**

[104]

*Ancient Population History in the Palenque Region: The Problem of the Selection of Population Proxies*

The Proyecto Regional Palenque (PREP) has recorded a total of 653 sites within an area of 650 km<sup>2</sup>. Regional population ranges from 28,000 to 32,000 inhabitants. Mapping efforts and household excavations undertaken as part of the Proyecto Especial Palenque during the seasons of 1992–1994 identified 1,480 structures at the site core with a probable population range of 6,000–8,000 residents. According to this estimate, population densities within city limits were quite high, 2,000–2,666 persons/km<sup>2</sup>, a number only comparable to Mayapan or Copan's estimates. What really strikes for Palenque is the difference in terms of the sheer number and density of structures present within the site core compared to its immediate surroundings. Definitely, Palenque urban core represents and environment qualitatively different from anything surrounding it. During the Balunte period (AD 750–820) the immediate city hinterland (approximately 37 km<sup>2</sup>) was a region with an extremely low population density (25 persons/km<sup>2</sup>). The space between main regional centers remained sparsely occupied. Using recently obtained lidar data, better chronological dating, and new excavation information, this presentation will focus on several issues relevant to the building of more robust Ancient Maya population estimates.

**Lieske Vides, Rosemary (Vanderbilt University)**

[8]

*Entanglement and Colonial Power: A Geophysical Case Study of Settlement Patterns at Ciudad Vieja, El Salvador*

As the Spanish entered Guatemala in AD 1523, they did so with the aid of thousands of Indigenous warriors. Though often ignored in history, the role of these Indigenous allies was fundamental in colonizing and maintaining new territories for the Spanish Crown. These Indigenous conquistadors settled alongside the Spanish in the peripheries of their newly constructed towns. Town planning and spatial organization were forms of social control utilized by the Spanish to exert and create social hierarchy in their towns (Soja 1989). The organization of Indigenous space in Spanish towns illuminates the degree in which these cultural groups were entangled in Spanish policy. With the use of remote sensing, specifically testing for magnetic susceptibility, I surveyed the peripheral communities of Ciudad Vieja, the archaeological remains of the first villa de San Salvador, El Salvador (AD 1528). Geophysical

survey illuminated the settlement patterns of these peripheral communities and demonstrated the ways in which Indigenous allies maintained a semblance of autonomy or negotiated power in their communities during the conquest era.

**Lightfoot, Kent (University of California, Berkeley)**

**[165]**

*Discussant*

**Lilley, Ian (University of Queensland), Kelsey Lowe (University of Queensland), Nick Bainton (University of Queensland) and Richard Martin (University of Queensland)**

**[38]**

*Preliminary Investigations of Missing American Service Members in Papua New Guinea*

The University of Queensland (UQ) has partnered with DPAA to bring renewed focus to a search in East New Britain, Papua New Guinea, that has been continuing intermittently since an aircraft went missing in 1943. The operation is challenging because we have only a general idea of where the plane went down and it falls on the most extreme terrain on earth. There are also significant numbers of wartime aircraft losses reported in the area, Allied and Japanese, so finding the right plane is difficult. A small team of experienced PNG researchers assessed the terrain and established relationships with local villagers to facilitate access to their lands and ask about crash sites. A larger team followed up with methods and results to be highlighted in this poster. This work builds on UQ's archaeological and PNG expertise to expand UQCHU's repertoire beyond Australia. We envision this search will create research opportunities between UQ, DPAA, and others such as the University of Papua New Guinea and the PNG National Museum. Such research addresses broader questions regarding archaeological technicalities of the work entailed in DPAA projects and the social and political dynamics of searching for missing American service members in non-Western societies.

**Lillios, Katina (University of Iowa)**

**[174]**

*Archaeological Evidence for Islamic Uses of Megalithic Structures in al-Andalus (CE 711–1492)*

At the time of the Islamic conquest of the Iberian Peninsula, the landscape was dotted with countless ancient sites, including megalithic monuments constructed between the sixth and third millennium BCE. Were these sites ignored, defaced, or destroyed, as they dated to the time before Muhammad (Age of Ignorance/ *jāhiliyyah*), or is there archaeological evidence for engagement with these ancient remains? This paper summarizes the available archaeological evidence for Islamic uses of these most durable and visible of ancient structures on the Peninsula through the presence of artifacts and dated human remains. Little research has been conducted on this question, and despite the many challenges to this study, I suggest that this exploration has the potential to contribute to our understanding of the materiality of these monuments and their ability to shape Islamic societies and practices thousands of years after their construction.

**Lin, Sam (University of Wollongong) and Alex Mackay (University of Wollongong)**

**[58]**

*The Role of Parsimony in Archaeological Inference Building*

In archaeology, distinct processes in the past can generate similar patterning in the material record under varying temporal and spatial scales. Facing this challenge of equifinality, archaeologists frequently use parsimony to help assess competing explanatory models by preferring simpler explanations over more complex ones. However, there is little consensus on what model simplicity is determined. More often than not, the parsimony principle is invoked as an ad hoc appeal, with the assumption that more parsimonious explanations are more plausible. In this paper, we argue that there is no theoretical justification to associate parsimony with credibility in archaeology. Moreover, without recognizing the formational dynamics and the aggregate nature of the archaeological phenomenon, an uncritical treatment of the parsimony principle risks reducing emergent patterns in the material record to singular "simpler" sources of variation. In many cases, these singular explanatory factors are actually complex in their implicit assumptions about the nature of the archaeological record. We propose that parsimony should not be treated as a rule for judging competing explanations, but used to help disentangle assumptions among alternate hypotheses, particularly with respect to the connection between human behavior and archaeological formation.

**[58]**

*Chair*

Lin, Saw Tun [150] see Macrae, Scott

Lincoln, Noa [194] see Peck, Katherine

**Linderholm, Anna (The BiG lab, Texas A&M)**

**[70]**

*Ancient DNA from Etruscan Tombs and Beyond: A Case Study from San Giuliano*

**[WITHDRAWN]**

Linderholm, Anna [7] see Johnson, Taryn

**Lindley, Tiffany (University of Texas, San Antonio)****[152]**

*Making Choices in the Maya Hinterlands: An Analysis of Terminal Classic Households at Floodplain North, Western Belize*

Investigations at Floodplain North of the San Lorenzo Survey Area, located in the hinterlands of Xunantunich, examined the political and economic behaviors of a community as the navigated major transformations of the Terminal Classic (AD 780–950) period. While causes of the Maya collapse, the abandonment of large centers, and the changes in elite culture have experienced significant study, the active choices and behaviors of non-elites immediately prior, during, and after collapse were the focus of this study. This research addresses how rural settlements negotiated the collapse through archaeological examination of household settlements of hinterland commoners. Floodplain North was an ideal settlement to examine these processes due to long occupation history throughout the settlement cluster, with evidence of occupation in the Early Classic, Classic, and Postclassic periods. Choices made by commoners of Floodplain North were the result of active engagement with the broader political and economic transformations occurring in the Mopan River valley. While the political and ceremonial center of Xunantunich began to wane in power and influence, residents of Floodplain North continued to farm their land and reinforce local authority. While many people migrated out of Mopan Valley following the Terminal Classic collapse, a contingent remained at Floodplain North.

**Linstädter, Jörg (Deutsches Archäologisches Institut), Nikola Babucic (University of Hamburg), Sabrina Stempfle (University of Hamburg) and Martina Seifert (University of Hamburg)****[124]**

*Tracing Early Farming Communities in Southern Mozambique by Geophysical Prospection: Current State of Activities, Part 1*

In southern Africa, the appearance of pottery was first recognized in the context of Early Farming Communities (EFC) about 2000 BP. Increasingly, pottery can be linked to hunter-gatherers; therefore, southern Africa stands out as a place to investigate the contact between these two communities. In 2016, Eduardo Mondlane University Maputo and the German Archaeological Institute started a joint research project. Various surveys in Changanane, Maputo Province, documented new sites. In 2018, an initial geomagnetic prospection was performed at an open-air site near the famous Daimane shelter. The survey detected 18 magnetic anomalies that revealed two round anomalies interpreted as possible huts or kilns. The general lack of comparative studies necessitated verification by other geophysical methods and archaeological excavation. Therefore, in cooperation with Hamburg University, geophysical surveys were conducted. The recording of magnetic variations and electromagnetic signal responses may help to indicate further pithouses, pottery fields, and kilns in the context of EFC. The results will reveal additional excavation sites, which in return will allow confirmation of the geophysical results. Subsequently the project will be expanded to include archaeometric pottery analysis. The paper provides an introduction to the project and focuses on the work done so far.

Linstädter, Jörg [124] see Babucic, Nikola

Linstädter, Jörg [124] see Fonseca, Sofia

Linstädter, Jörg [124] see Stempfle, Sabrina

**Lipe, William (Washington State University)****[126]***Ruthann's Rivers: Archaeology and Archaeopolitics on the Middle Fork and Dolores Projects*

Two projects with both substantive archaeological and archaeopolitical aspects are discussed. First, Ruthann's role in leading a survey of Forest Service campgrounds on the Middle Fork of the Salmon River in central Idaho and her related work to obtain better representation of cultural resources in Wilderness Area management plans. Second her contributions to helping plan the research designs and organization of the Dolores Archaeological Project in Colorado and her related efforts to obtain changes in funding limits under relevant federal legislation.

Lipo, Carl [97] see DiNapoli, Robert

**Lippert, Dorothy (National Museum of Natural History), Desireé Martinez (Cogstone Resource Management Inc.) and Michael Wilcox (Stanford University)****[25]***Assessing Knowledge of Native American Tribes and Their Heritage: An Interactive Poster*

The practice of American archaeology, and the knowledge it produces, have impacts on the social, economic, and political policies and laws that affect Native American Tribes and Native American community members. Non-Native cultural heritage and resource managers, academic researchers, and museum staff who work with tribal heritage often lack basic knowledge about the tribes, their history, their traditional practices, and their special relationship with the US government. Archaeologists with specialization in aspects of tribal cultural heritage may fail to recognize lacunae within their knowledge, hindering successful collaborative work with tribes. As Native American archaeologists, the authors recognize the value of providing basic information about tribes to our non-Native peers. Topics that we have found are often overlooked include, but are not limited to, an understanding of tribal legal rights, what tribal sovereignty entails, where tribal lands are located, the duties of a THPO, and the nature of traditional knowledge. Join us for an exciting interactive game to assess your knowledge of Native American Tribes, their past, present, and future. We expect that playful engagement with each other may lead to greater retention of knowledge and hope our colleagues feel free to ask questions regarding tribes about which they may always have wondered. We encourage everyone to stop by our booth in the Exhibit Hall and try out our game!

**Lippert, Dorothy (National Museum of Natural History)****[112]***Discussant*

**Lira-Lopez, Yamile**

[122]

*La Piedra del Gigante de Orizaba y el Monolito de Maltrata: Estudios iconográficos y su protección como patrimonio arqueológico*  
La Piedra del Gigante y el Monolito de Maltrata, pertenecen a lo que se llama escultura monumental en piedra, y se encuentran ubicadas en la región de los valles intermontanos de las Grandes Montañas, al centro y oeste de estado de Veracruz. Son importantes representaciones en bloque amorfo de piedra que relatan un evento social-político-astronómico, encontradas in situ. Esto las hace aún más relevantes, pues su contexto permite proponer interpretaciones sobre su significado, estilo y asociación cultural, que nos acercan al pensamiento de la población que las elaboró, además de que son las únicas de su estilo y tamaño reportadas hasta el momento en la región. La Piedra del Gigante, localizada en el actual panteón municipal Juan de la Luz Enríquez de la ciudad de Orizaba, se encuentra a la intemperie, bajo resguardo del Ayuntamiento de Orizaba y del Instituto Nacional de Antropología e Historia. El monolito de Maltrata, en cambio, se encuentra actualmente en el Museo de Antropología de Xalapa, resguardado en una dependencia de la Universidad Veracruzana. En esta ponencia presento cómo se encontraron, su contexto temporal y cultural, interpretaciones iconográficas y su importancia como patrimonio cultural que obligan a su protección y divulgación.

**Liss, Brady (University of California, San Diego), Matthew Howland (University of California, San Diego), Anthony Tamberino (University of California, San Diego), Scott McAvoy (University of California, San Diego) and Thomas Levy (University of California, San Diego)**

[29]

*Archival Photogrammetry: Repurposing Excavation Photographs to 3D Model Previous Excavations in Faynan, Jordan*  
Using photography to thoroughly document the excavation process is a common and long-standing practice on most archaeological excavations. Moreover, since the advent of digital photography, the number of photos captured of an excavation has generally increased. The Edom Lowlands Regional Archaeology Project (directed by Thomas E. Levy and Mohammad Najjar) has used digital photography to record their excavations since the project's inception in 1997. While these original excavation photos were not intended for photogrammetry (using digital photos to produce 3D models), their rigorous photography strategy affords an opportunity to potentially repurpose this archival data for 3D modeling. In addition, these photos captured the excavation in its original state, before any damages of time. This poster explores this possibility based on archival photographs from the 2002 and 2006 excavations at Khirbat en-Nahas, an Iron Age copper smelting center in Faynan, Jordan. Using an excavation into a slag mound that has since collapsed as a case study, this poster presents the methods and results of this process along with one method for sharing this data using virtual reality. In doing so, it provides a case study of using archived photography to produce 3D models for the preservation and dissemination of archaeological sites/excavations.

Liss, Brady [168] see Howland, Matthew

**Littledale, Sylvie (Brigham Young University) and Zach Chase (Brigham Young University)**

[118]

*The Landscapes of Huarochiri (Peru) in Written Historical and Oral Traditions*

Personified landscapes—comprising or populated by animate beings (*tirakuna*, earth beings, huacas, *apus*)—feature centrally in discussions of the archaeological, historical, and ethnographic records of Andean societies. Because of its unique seventeenth-century Quechua manuscript, this tendency has been particularly influential in Huarochiri, Peru. The manuscript's narratives are vitalized by the adventures and personalities of a host of regional huacas, superhuman entities localized in and generative of the narrators' landscape. Here, we present recent ethnographic data from present-day oral traditions in Huarochiri that provide depictions of a landscape that is less anthropomorphized yet no less animate than the historical examples. While the ethnographic landscape is not constituted by defined superhuman persons, local populations do attribute agency to the landscape, allowing it to interact with them and guide their activities. We consider the implications of these different expressions of Andean landscapes for the ways archaeologists approach the perception of sites of cultural significance, and the production of place more broadly.

Littman, Robert [96] see Silverstein, Jay

**Liu, Xinyi (Washington University in St. Louis)**

[94]

*Cooking, Cuisine, and Class: The Ritualistic Aspect of Eurasian Foodways*

Recent investigation has shown that between 5000 and 1500 cal BC, the Eurasian and African landmass underpinned a continental-scale process of "globalization" of food and foodways. By 1500 cal BC, the trans-Eurasian exchange of cereal crops brought together previously isolated agricultural systems to form a new kind of network. In this paper, I move beyond the discussion of the routes and chronologies of the "food globalization" and consider the context in which agricultural innovation occurred, particularly in urban environments. By the time the movement of crops between sites had reached a continental scale, the food practices had been contained within the social relations in both east and west Eurasia. How this local containment and continental connectivity interrelate is a topic of ongoing debate, but the timing is associated with the rise of urbanism, particularly in central and western China. By the second millennium BC, Bronze Age communities in different parts of Eurasia are detaching arenas of production and consumption, containing them on different scales and within different hierarchies. Yet it is among these differentiated hierarchical communities that tangible connections interweave an entire continent.

**Livarda, Alexandra (Catalan Institute of Classical Archaeology) and Hector Orengo (Catalan Institute of Classical Archaeology)**

**[156]**

*Decoding the Molecular Structure of Food Culture*

There are many different ways to approach food and food culture as windows into past lifeways. In this paper we discuss how food plant evidence, landscape data, and new technologies can be combined to provide new approaches that allow the study of webs of communication that can explain variable socioeconomic settings through time in different scales. In this paper we take a step back from our previous work to offer an overview of the theoretical underpinnings of our methods and the potential for future research into past food culture. Firstly, we deconstruct the methods into their basic units of analysis, space, time, and co-relation networks. Secondly, we examine their analytical potential; thirdly, we investigate their significance for archaeological interpretation, and finally, we reassemble them into a unified theoretical framework for the analysis of past food culture. Our suggested framework can potentially transform rich qualitative data into relational quantitative values that can be used to mathematically explore and model past cultural practices. We use a series of case studies drawn from our different lines of work across Europe through time to showcase how our deconstruction of the so-called molecular relationships of food contexts allow new insights into ultimately cultural practices.

**Liwoz, Chester (Mesa Prieta Petroglyph Project)**

**[176]**

*Selective Hearing: Toward a Puebloan Probability Model for Archaeoacoustic Landscape Properties Using Iconography and Geophysical Variables*

Since the first forays into the use of databases and computational analysis of rock art compositions by Leroi-Gourhan in the middle of the twentieth century, digital archaeology applications have boomed, becoming a virtual necessity in twenty-first-century practice. Contemporary computerized tools for managing “big-data” facilitate scholars’ unprecedented capacities to archive, manage, and swiftly analyze large volume datasets, shifting the biggest burden toward developing effective and informed attribute-based models as opposed to compiling sufficient sample sizes. This paper proposes a set of weighted criteria for identifying culturally significant landscape acoustics in the Puebloan Southwest based on experimental results at research loci selected from an existing database of documented petroglyph panels along the Rio Grande in northern New Mexico. A targeted sampling strategy was employed to sample locations suspected to have strong sonic significance, and a comparative sample of loci suspected to have little or alternative motivating factors. All locations underwent impulse response tests using percussion and sinusoidal sweeps, and were virtually modeled in 3D to better understand the relationships of possible reflecting surfaces. Ultimately, this paper aims to improve research and sonic heritage conservation strategies by suggesting means of sifting through the ever-increasing large datasets available to twenty-first-century archaeoacoustics scholars.

Llamas, Bastien [83] see Weyrich, Laura

**Lobato, Thomas (Arizona State University)**

**[30]**

*Burials and Society at Teotihuacan: Examining Inequality through Burial Offerings in Residential Contexts*

Many archaeologists think that Teotihuacan was a relatively equalitarian society. Prior research on economic inequity has focused on factors such as the size of houses and the remains of murals in residential complexes. The Burials and Society project approaches the question of inequality at Teotihuacan from a new angle, that of burial data. The project has compiled a data base of over 800 burials from residential contexts and their associated offerings. One line of analysis focuses on socioeconomic inequality such as inter-complex disparities in wealth (e.g., percentage of burials with imported goods and presence of high value offerings by structure number). I present our preliminary results and discuss their implications with respect to the nature and extent of inequality at Teotihuacan.

Lobo, José [150] see Klassen, Sarah

Loendorf, Chris [87] see Morgan, Linda

Loendorf, Chris [143] see Plumlee, R. Scott

**Loendorf, Lawrence (Retired, Albuquerque, NM)**

**[53]**

*The Atlatl Motif in Rock Art*

Rock art researchers often claim that an oval with a vertical line through it represents an atlatl, but many of these depictions are not very convincing examples of atlatls. A better way to identify atlatls is to find examples that show anthropomorphs holding an atlatl while throwing a dart or holding an atlatl in a proper position. These examples are rare, but significant, because they can unequivocally demonstrate a pre-bow-and-arrow time frame and in turn have implications for research into warfare and the distribution of various rock art motifs.

**Lofaro, Ellen (University of Tennessee) and Anne Amati (University of Denver)**

**[25]**

*Let's Talk about a NAGPRA Community of Practice*

As we reflect on the 30th anniversary of the Native American Graves Protection and Repatriation Act of 1990 (NAGPRA), practitioners recognize the progress that has been made and acknowledge the vast amount of work left to be done. In order to meet that challenge, we need to increase capacity for NAGPRA implementation, improve overall engagement with ongoing NAGPRA work, and decrease misunderstanding and confusion still associated with NAGPRA. With the support of NAGPRA mentors and colleagues, the University of Denver Museum of Anthropology created the NAGPRA Community of Practice to advance implementation by bringing together people to connect and collaborate. Public discussions and a national survey have identified issues impacting NAGPRA implementation. For example, when asked if their museum or agency was respecting the rights of tribes under NAGPRA, 77% of museum survey respondents said yes but only 23% of tribal respondents agreed. These numbers highlight the lack of collaboration and communication that many recognize as one of the core issues impacting NAGPRA implementation. Learn more about the current state of NAGPRA implementation, survey results, and how you can get involved with the NAGPRA Community of Practice.

**Lofaro, Ellen (University of Tennessee)**

**[161]**

*Discussant*

Lofthouse, Susan [148] see Ryan, Karen

**Logan, Amanda (Northwestern University)**

**[134]**

*Discussant*

**Logan, Amanda (Northwestern University) and Sophie Reilly (Northwestern University)**

**[156]**

*Food Archaeology for Social Justice*

Why do we do food archaeology, and what can we use it for? In the last few decades, social archaeology has strongly shaped approaches to food in the past, directing our attention to how food is used to create social boundaries and values. More than ever before, archaeology is now facing the challenge of making ourselves relevant to the communities we work in and the multiple publics we serve, by focusing on hot topic issues like sustainability, resilience, and food security. Building on examples from the Americas and Africa, we consider how a social archaeology of food has shaped and can further embrace an explicitly political agenda to address some of the social challenges of our present moment, including inequality, anti-racism, and Indigenous food sovereignty.

**Lohse, Jon (Terracon Consultants Inc.)**

**[138]**

*Discussant*

**London, Marilyn (University of Maryland) and Adam Fracchia (University of Maryland)**

**[38]**

*University of Maryland Forensic Aviation Archaeology Field School*

The University of Maryland Department of Anthropology has partnered with DPAA since 2016 for the recovery of American MIA military personnel. UMD faculty developed a summer field school through the Education Abroad program, with support from the UMD Department of Anthropology and the University of Vienna's Institute of Prehistory and Historical Archaeology. The course includes one week of classroom and hands-on instruction and five weeks of excavation. We have taken 24 US students to work on two aircraft crash sites in Austria over the past four years. DPAA protocols are followed. Students learn archaeological techniques, recognition of human remains and probative evidence, basic forensic science, documentation, inventory, photography, and mapping. The faculty supervises and reviews all excavation and recovery and provides DPAA with standardized reports, both daily and at the end of the field season. This partnership provides students with specialized training, the experience of traveling and living in a foreign country, and a chance to work with students from several institutions, including the University of Vienna. The University of Maryland is honored to be a part of this important recovery program, and hopes to continue the work with its annual field school.

Look, Cory [194] see Brown, Matthew

**Loomis, Sarah (Harvard University)**

**[155]**

*Sacrifice and the Skeleton: Mortuary Archaeology at Los Guachimontones*

This presentation examines the mortuary practices in excavated burials at Late Formative and Early Classic (300 BCE–400 CE) Los Guachimontones in Jalisco, Mexico. This site, with features such as shaft tombs and circular public architecture, is exemplary of the unusual regional cultural tradition of ancient West Mexico. An analysis of the mortuary remains found in both public and residential contexts across Los Guachimontones reveals the sacrificial practices associated with this monumental ceremonial center. Beneath the earthen architecture are group burials, with specific types of individuals (e.g., warriors, those with certain congenital illnesses and deformities, and children) targeted for violent deaths, symbolic arrangements of remains, and possible human consumption. The choice of sacrificial offerings and the cosmological structures seen in the burial arrangements connect Los Guachimontones to ideologies found in the broader Mesoamerican sphere. The burials also demonstrate the emergence of sociopolitical complexity at

the site, with lineage-based leadership capable of directing the construction of monumental architecture, alongside sacrificial and ceremonial activities to emphasize and maintain the power of the sacred center.

**Lopez, Andrea (Mississippi State University)**

[43]

*Where We Are Five Years Later: A Reexamination of Gender Disparities in Publication Trends in North American Archaeological Journals*

This project builds on the work of Dr. Bardolph's 2014 gender research, where she analyzed gender publication trends across 11 major archaeological journals from 1995 to 2014, assessing disparities between men and women in their number of publications. Her research put statistical value on what many researchers had before found to be true—men had higher rates of publication over women, often by wide margins. She argued this trend was a result of authorial behavior, not editor bias, as women were less likely to submit or resubmit publications for submission over male peers. In the five years since its publication, the difference between the number of women and men in archaeology has expanded, with women making up greater portions of graduate students and professionals than before, with those numbers growing every passing year. Due to recent events, both in archaeology and the world-at-large, where light is being shed on gender inequalities and abuse, this project reexamined those same 11 archaeological journals, evaluating whether publication trends have changed in the five years since Bardolph's survey, and where the future of archaeology is heading, from the perspective of an archaeologist on the cusp of a professional career.

Lopez, Andrea [10] see Porter, Keri

Lopez, Eos [181] see Johnson, Lisa

**Lopez, Kirsten (Oregon State University)**

[54]

*Fiber-Perishables Sourcing in the Northern Great Basin*

Strontium sourcing is a technique often used in sourcing the origin or migration patterns of animal and human remains but also used occasionally to source the growing location of plant material. While these studies are uncommon, they are not new. Here I will be presenting the eagerly awaited results of the sourcing data from Terminal Pleistocene and Early Holocene plant material refuse from Paisley Caves textile manufacture and the surrounding environment. This study encompasses a large modern landscape background dataset development, and the testing of six samples from the lower deposits in Paisley Caves dating from 12,600–8000 cal BP, from caves 1 and 2. The archaeological samples are focused on the basketry or textile trimmings created during manufacture, and environmental or bulk material deposits. Environmental samples draw from various sub-drainages within the Chewaucan and Warner Basins, and to a lesser extent Guano Basin, and Catlow Basin.

López Bravo, Roberto [13] see George, Miranda

López Bravo, Roberto [136] see Paris, Elizabeth

**López Corral, Aurelio (INAH)**

[71]

*War Milpas: Wetlands and Institutional Agriculture during the Late Postclassic in Tlaxcallan, Mexico*

The Antigua Cienega de Tlaxcala is an area of wetlands located at the core of the Puebla-Tlaxcala valley in central Mexico. Historically, these marshlands have been exploited agriculturally using drained field technology and are well-known for providing higher yields in comparison to other rain-fed agricultural fields. This paper analyses the importance of the Cienega as an intensive food production region for the support of institutional apparatuses of Tlaxcallan during the Late Postclassic (AD 1250–1519). Current archaeological, historical, and agricultural information is analyzed to estimate agricultural production capacity, including data on the distribution of soils associated with wetlands, the indigenous technology of wetland exploitation, settlement patterns, and geopolitical boundaries of state-level political entities settled in the Puebla-Tlaxcala valley. Results suggest that wetlands represented a crucial economic base for the institutional economy of Tlaxcallan at a time of serious regional and interregional conflicts.

**López Mendoza, Patricio (Museo de Historia Natural y Cultural del Desierto de Atacama), Rodrigo Loyola (Universidad Católica del Norte), Carlos Carrasco (Colegio de Arqueólogos de Chile), Valentina Flores-Aqueveque (Universidad de Chile) and Antonio Maldonado (Centro de Estudios Avanzados en Zonas Áridas)**

[47]

*Early Occupations of the Late Pleistocene–Early Holocene in the Northern Highlands of the Semiarid North of Chile*

Here, we present the results of archaeological surveys and excavations carried out in the Pedernales Salt Flat and the upper course of the Jorquera River (26°–27° S, 3,000–4,500 m asl). Environmentally, they are characterized by an Andean steppe with biotic resources distributed in patches. Surveys were directed toward specific geoforms such as river terraces, alluvial fans, wetlands, and salt flat surroundings. As result, high abundance and diversity of archaeological findings were detected, evidencing human occupations related to the most favorable environmental and climatic conditions during the late Pleistocene–early Holocene. Evidence, particularly from the lithic record, enables to establish links with contemporary cultural traditions in neighboring areas. These include Huentelauquén Cultural Complex (12,600–8000 years cal BP) on the semiarid coast, Tuina Inca-Cueva Complex of the de Atacama Salt Flat Basin (13,000–9500 years cal BP) and the findings of Punta Negra-1 (12,600–10,200 years cal BP) of the Arid North, among others. Finally, we discuss the recorded evidence according to the paleoenvironmental and geoarchaeological



context. We propose that the highlands were far from being marginal and unattractive environments for the groups of hunter-gatherers that populated this region during the initial phases of exploration and colonization.

**López-Puértolas, Carlos (Universidad Nacional Autónoma de México), Linda Manzanilla (Universidad Nacional Autónoma de México) and Maria Luisa Vázquez-de Ágredos-Pascual (Universitat de Valencia)**  
[50]

*La tecnología del color en Xalla: Instrumentos, materias primas y procesos de manufactura*

El color es uno de los elementos característicos de Teotihuacan, tal y como refleja la rica policromía expresada en soportes como la arquitectura y su pintura mural o la cerámica estucada y pintada. Sin embargo, poco se conoce sobre cómo se elaboraba color en la ciudad Clásica del Centro de México (150/200–650 dC) ¿Qué materias primas se utilizaban? ¿Cuáles eran las mezclas? ¿Cuáles eran las herramientas y pasos de su cadena operativa? Los diversos útiles de lítica pulida recuperados en Xalla han permitido conocer un poco más sobre diversos aspectos de la tecnología del color en la urbe mesoamericana. A partir de la combinación de arqueometría, arqueología e historia del arte, se ha logrado identificar los principales compuestos de la paleta pictórica de Xalla y se ha propuesto una cadena operativa para elaborar pigmentos dividida en cuatro pasos, desde el desbastado y limpieza de los minerales hasta el molido y mezcla de los diferentes compuestos que se utilizaron para embellecer las esculturas, los pisos y los muros de este complejo palaciego teotihuacano.

**Lopez Varela, Sandra (UNAM)**

[193]

*Mexico's Heritage through Pixar's Film Coco*

The archaeology of media frames the analysis of the film *Coco*, a 3D, animated, fictional movie inspired by Day of the Dead, or Día de Muertos, in Mexico, released by Pixar Animation Studios in 2017, a subsidiary of Walt Disney Studios. This paper analyzes the tensions and contradictions within Pixar's most successful movie at the box office in taking a stand against Donald Trump's calling Mexicans rapists and criminals who bring drugs across the border during his presidential campaign in 2015. This paper concludes this highly praised "pro-Mexico" film by its audience and critics does not vindicate Mexico's "good people." Instead, the film promotes a nationalistic and institutionalized image of Mexico's heritage and identity, in the works since the nineteenth century. "Disney" owning the largest market share in the film industry and *Coco*'s director Lee Unkrich's good intentions to make this film "right," rather support the state in its reproduction of a community whose formation required the homogenization of Mexico's culture, obscuring the non-dominant lifeways of a cultural rich and diverse country, and which is now filtered through his camera lens and consumed by worldwide audiences, which most certainly will remake it in a variety of ways.

[193]

*Chair*

**Lorenz, Wayne**

[167]

*Mosaic Water Fountains in Pompeii*

Water was a key element in the life of the Roman citizen in Pompeii. Beautiful mosaic fountain structures were constructed in several of the houses and gardens in Pompeii. So far, 11 locations with mosaic fountains have been excavated. Some of these were impressive in size, with the largest mosaic fountain located in the House of the Mosaic Columns measuring 12.5 feet wide by 14 feet high. A Roman urban architectural goal in antiquity was the use of in-house, plumbed water to foster a pleasing sensual setting. The sights and sounds of water in the key living space areas conveyed by the mosaic fountains were used to create illusions of pleasure, wealth, and leisure. These fountains were adorned with multicolored glass tiles and arranged to display images of deities and other art. Seashells (both small conches and clams) and pumice stones were used in the walls and aedicula, where bronze and marble statuettes spouted water into cascades and basins. With water as the main attraction to mosaic structure, the design of the alignment of piping and water pressure were evaluated in several of the mosaic locations and will be shown.

[167]

*Chair*

Lorenz, Wayne [167] see Truster, Kate

**Lothrop, Jonathan (New York State Museum)**

[134]

*Discussant*

Louderback, Lisbeth [7] see Tucker, Kaley

Louderback, Lisbeth [41] see Wilks, Stefania

Loughlin, Michael [104] see Pool, Christopher

**Lovata, Troy (University of New Mexico)**

[20]

*Contemporary Wickiups in the Mountains of Northern New Mexico*

Wickiups—sometimes labeled as lean-tos or even misidentified as tipis—are relatively ephemeral, petite wooden structures with a

clear presence in the American Intermountain West. Extensive archaeological research has been conducted into wickiups created by Numic peoples and Utes and Apaches in the protohistoric and historic periods. Yet, as with artifacts and features like rock cairns and graffiti, archaeologists and resource managers often make hard delineations between contemporary and historic or prehistoric examples—for example, seeking to record and protect them on one hand while admonishing people from continuing to build modern examples on public lands today. In contrast, this study of contemporary wickiups in the mountain forests of Northern New Mexico and their presence in local popular culture shows their value in understanding how a range of people today respond to, live within, shape, and perceive their environment. Rather than viewing them as created simply in acts of historical mimicry, vandalism or resource destruction; their existence are examples of cultural continuity, sharing of community resources, and reactions to degraded and disrupted landscapes. Archaeological study of contemporary wickiups in New Mexico as material expression leads to an understanding of how people participate in place.

Loven, Jeremy [187] see Miller, Kye

Lowe, Kelsey [38] see Lilley, Ian

### **Lowe, Lexie (Binghamton University)**

[33]

#### *Geographic Information Systems (GIS) and the Analysis of Cut Marks for Archaeological Faunal Collections*

Within zooarchaeological discourse, a central theme concerning taphonomic studies is the observation and analysis of cut marks on faunal specimens. Of particular importance is the maintenance and consistency of methodological approaches in applying archaeological inferences to the diagnostic surface modifications on bones. Despite calls for standardization, the observational criteria for cut marks that analysts record (e.g., length, orientation, aspect location, element, species, frequency) are often limited to dissociated numerical tables and hand-drawn templates. Moreover, while the current global pandemic has rendered physical access to collections difficult, it has encouraged the exploration of virtual alternatives for artifact analysis. Advances in geographical software contribute to this discussion by offering adaptable solutions for statistical and visual analyses, as well as record-keeping. Although geographic information systems (GIS) have predominantly been utilized for intersite and intrasite spatial analysis, recent studies have demonstrated the unorthodox capabilities of this software in the taphonomic analysis of individual artifacts, especially archaeofauna. This project aims to contribute to this discussion by exploring the current potential of GIS as an analytical tool for the study of cut marks on faunal specimens from archaeological collections; this will be accomplished through a methodological workflow that utilizes experimental faunal specimens and ArcGIS.

Loyola, Rodrigo [47] see López Mendoza, Patricio

### **Lozada, Josué, Joel Palka (Arizona State University) and Fabiola Sanchez (Proyecto Xanvil)**

[59]

#### *Mirador Mountain, Ritual Landscapes, and the Protohistoric Maya Community at Mensabak, Chiapas, Mexico*

Mirador Mountain, or Chak Aktun for contemporary Lacandon Maya, dominates the landscape at Lake Mensabak, Chiapas, Mexico. The mountain, which has a natural red stain on its east side, rises from an island. Late Preclassic Maya (ca. 200 BCE–200 CE) created temples, platforms, and plazas on the island Mountain for an Aztlán-like ritual landscape. Local Lacandon state that the mountain contains water and the Tulijá River, a major water course running to the Gulf Coast, originates at this lake. Past Maya pilgrims and migrants traveled along the river until they reached Mensabak to carry out rituals on the Mirador Mountain altopetl. Protohistoric Maya (ca. 1300–1700 CE) settlements then coalesced along the lakeshore with this water mountain becoming the center of community identity. These Maya undertook collective rituals at shrines on the mountain and nearby cliffs in the lake to build solidarity among the incoming populations.

Lozada, Josué [189] see Sanchez, Fabiola

Lozano, Sergi [92] see Fulminante, Francesca

### **Lozano, Stephanie (University of California, Riverside)**

[101]

#### *Foreign Influence on Teotihuacan's Religion through an Iconographic Analysis*

Foreign influence was a major component at Teotihuacan from very early on and throughout Teotihuacan's history. Extensive archaeological research notes Teotihuacan as a religious center and the largest Classic Mesoamerican city with multiethnic apartment compounds and neighborhoods. However, the impact of foreign influence on Teotihuacan's religion has not been studied. In this paper I present new perspectives of multicultural influence on Teotihuacan's religion through the study of iconography. Here, I analyze foreign impact on the Teotihuacan state deity strongly associated with cosmology, the Teotihuacan Tlaloc from the iconographic and the archaeological record. In addition, I analyze heart and blood offerings depicted in Teotihuacan's iconography to note the presence of foreign influence. My interpretations are derived from cross cultural comparisons of iconographic representations of offerings associated with blood, hearts, maize, and rain deities represented in other Mesoamerican cultures such as with the Maya and Zapotec. Finally, I suggest that Teotihuacan integrated multiethnic religious ideology through iconographic representations at Teotihuacan, which may have contributed to Teotihuacan's continued presence in other areas of Mesoamerica even after the fall of Teotihuacan and into the Late Classic period (AD 600–900).

**Lu, Jou-chun (National Taiwan University)****[117]***The Different Consuming Strategies between Political Center and Port City: A Case Study of the Distribution of Yue Celadon Types in Eighth- to Eleventh-Century Japan*

In ancient Japan, the trade of Chinese ceramics started in the eighth century. The most popular ceramics among Japanese consumers was Yue celadon. Since Yue celadon is found with a small number and limited spatial distribution of fine and coarse wares, this type of ceramics is usually considered by researchers as a luxury good that only reflected the political structures. Although the ancient Japanese government had priority to access trade ceramics, it could not monopolize the market. A free market for Yue celadon still existed. Thus, besides the influence of the political realm, it is also important to analyze the consumer preferences and how they reflect cultural and social structure. In this paper, I argue that we can understand the ancient Japanese consumption of celadon ceramics more thoroughly by analyzing their function and art style, which previous scholarship fails to consider. This paper then uses a typology based on ceramics shapes linked with function and art style to illuminate both consumer preferences and various consumption strategies of the political center (Heian-kyō) and a port city (Dazaifu) in ancient Japan. It also explains the effectiveness of this research method in revealing the consumption patterns of ancient Japan.

**Lubkemann, Stephen, Paul Gardullo (Smithsonian National Museum of African American History and Culture), Jaco Boshoff (IZIKO Museums of South Africa), Yolanda Pinto Duarte (Eduardo Mondlane University-CAIRIM) and David Morgan (US National Park Service)**
**[146]***Toward a Transformative Maritime Archaeology of the Slave Trade: Reflections from the Slave Wrecks Project Research Programs in Mozambique and South Africa*

Drawing on work in Mozambique and South Africa undertaken over the last five years this paper examines how the Slave Wrecks Project's field research program and its stakeholder engagement initiatives have come to inform each other in profoundly transformative ways. Our investigations of specific slaver shipwrecks have compelled a reconceptualization of notions of "the site" itself and of research strategies for addressing the "Black Atlantic," while also underwriting complex reconsiderations of concepts of "heritage," "stake" and "stakeholder," "community," "engagement," and "memory." SWP's emerging approach has drawn from sources as diverse as South African critiques of apartheid's "heritage legacy" and Mozambican cultural scripts for contending with historical violence. We reflect on the signature approach emerging from this struggle to be "ethical social navigators" in contexts where stakeholders may disagree with researchers and each other about the past's meanings; about the merits of, or methods for, its recovery; and about the disposition of tangible vestiges of the lived past in the living present. In conclusion we call for a transformative maritime archaeology of the slave trade that will challenge maritime archaeology—both analytically and as a socially embedded practice, critically contending with colonial and nationalist legacies that have implicitly shaped it.

Lubkemann, Stephen [146] see Duarte, Ricardo

Luin, Camilo [152] see Vepretskii, Sergei

Luisi, Pierre [55] see Nores, Rodrigo

**Lujan Sanders, Mariana****[99]***Chair*

Lujan Sanders, Mariana [26] see Schleher, Kari

**Lukas, Dominik (University of Chicago)****[191]***The Living Archive of Çatalhöyük (LAC): Providing Big Data Laboratories as Open Environments for Archaeological Research*

In archaeology data are stored in ways that reflect the strategies of research while conventional data repositories tend to freeze the original databases within their initial storage logic. In contrast, the interpretation of primary evidence changes during a project's lifecycle, and it becomes difficult for later researchers with different research questions, to make sense of highly codified archives fossilized in their own starting assumptions. The data of the Çatalhöyük Research Project is hereby a paradigmatic example, where research into the origins of settled agricultural life, the rise of civilization, emergence of religion and cognitive change has led to the accumulation of a dense record of information. The Living Archive has been developed to provide access to the data gathered at Çatalhöyük. In order to make the genealogy of interpretation transparent, the web-application incorporates semantic modeling techniques to reverse-engineer the interpretive process and reveals the underlying patterns in the development and/or abandonment of concepts and ideas. Datasets stored in distributed archives are aggregated following the principles of Linked Open Data. In this way further interaction with the data and the addition of new information is possible to allow for the generation of new knowledge within the same framework.

**[191]***Chair*

Luke, Christina [116] see Skaggs, Sheldon

**Luzzadder-Beach, Sheryl (University of Texas, Austin)****[188]***Discussant*

Luzzadder-Beach, Sheryl [80] see Krause, Samantha

**Lynch, Elizabeth (University of Wyoming), Mary Lou Larson (University of Wyoming) and Marcel Kornfeld (University of Wyoming)****[126]***Engaging with the Hell Gap Digital Archives through the Lens of Ruthann Knudson's "The Early Expeditions"*

Ruthann Knudson's chapter, "The Early Expeditions: University of Wyoming, Harvard University, and the Peabody Museum," in *Hell Gap: A Stratified Paleoindian Campsite at the Edge of the Rockies*, pulls together a range of experiences from the earliest discovery of the site. The chapter unfolds like a road map through the turbulent, uncharted waters of the nascent archaeological expeditions. In her own words, "This is the story of the participation of all these people in what was largely a volunteer effort to unravel the secrets of the past." The chapter serves as a unifying theme for our work on the digital archives project. This paper weaves together Ruthann's chapter with descriptions of our efforts to bring the Hell Gap National Historic Landmark into the digital age. We are currently digitizing the expedition data from the 1960s while also designing a virtual-reality tour of the site that will incorporate many of those volunteer experiences into an interactive educational tool. Her landmark chapter provides us guidance as we navigate the history of archaeological discovery. Our goal, much like her chapter, is to tell a story that creates connections across the space of time so that others might experience Hell Gap archaeology for themselves.

**Lynch, Joshua****[34]***Holocene Occupations of the Blair Lakes Archaeological District*

The Tanana Basin of interior Alaska is at the center of efforts to identify late Pleistocene and Holocene archaeological sites that better define regional occupation histories and provide insight into subarctic adaptation, technological organization, assemblage variability, mobility, and landscape use through time. The Blair Lakes Archaeological District is located in the Tanana Flats and encompasses the Blair Lakes and the associated terrace systems in a lowland basin north of the Alaska Range, between the Tanana and Nenana River valleys. Multiyear survey and excavation projects have confirmed five distinct Holocene occupations along the lake shore. These occupations began ~9,500 years ago and continued through the historic homesteading period. Additionally, these projects documented and collected a large assemblage of submerged artifacts from a near-shore underwater context and identified site-distribution and assemblage-variability patterns highlighting differential landscape use for foragers in the early, middle, and late Holocene, presented here through geomorphological profiles, artifact assemblages, and radiocarbon dates from six archaeological sites that ultimately contribute to the redefinition of the Blair Lakes Archaeological District. These results demonstrate the archaeological significance of the Blair Lakes Archaeological District and bolster our understanding of Holocene technological variability, site distribution, mobility, and occupations of understudied landscapes in interior Alaska.

**Lyons, Natasha (Ursus Heritage Consulting), Lisa Hodgetts (University of Western Ontario), David Haogak (Parks Canada) and Mervin Joe (Parks Canada)****[179]***Anatomy of an Arctic Archaeobotanical Analysis: Insights about Ancestral Inuvialuit Plant Use at Agvik, Banks Island, NWT*

Despite extensive Inuit knowledge of and interest in plants, archaeobotanical studies are incredibly rare in the Arctic, representing a clear bias of archaeologists. The proliferation of community-engaged research in the north is helping to open an avenue to more archaeobotanical work. While fish and mammals certainly composed the bulk of the Inuit diet, plants formed an important component of local economies and preserve extremely well in northern conditions. Plant foods eaten by Inuit throughout the circumpolar north are full of critical nutrients, and in the Western Arctic, where driftwood is abundant, this source of materials provided for building, transport, and domestic technologies. This paper presents an archaeobotanical analysis of a semi-subterranean *qarmat* dwelling at the site of Agvik (OkRn-1), located on the south coast of Banks Island, NWT, and dated AD 1380–1450 (calibrated). The plant assemblage, in concert with other analyses, tells us about the resource catchment, seasonality, and dietary patterns of Agvik's residents. We explore the continuity of plant use knowledge from ancestral Inuvialuit times to the present and consider what theoretical and methodological directions this study indicates for archaeobotany in Inuvialuit territory and beyond.

Lyons, Natasha [81] see Hodgetts, Lisa

**Lyons, Patrick (Arizona State Museum)****[183]***Discussant*

Lyons, Patrick [91] see Crown, Patricia

Lyons, Patrick [183] see MacFarland, Kathryn

**Lyons, Scott (University of California, Berkeley)****[141]***Reconstructing Ironworking on the Fifth- and Sixth-Century Osaka Plain*

Excavated sporadically for over 30 years, Ogata in Kashiwara City and Mori in Katano City are the largest-scale Kofun period

ironworking sites in Osaka Prefecture, Japan. Large numbers of forging slags have been unearthed from both sites, which alongside partially preserved hearth features, provide the bulk of evidence for ironworking. Following methods developed by French archaeometallurgists, novel analyses of these forge slags correlate different slag materials with different forging activities. This has allowed for more precise reconstructions of the kinds and range of ironworking activities at these two sites. This presentation combines these new analyses with new radiocarbon dates, charcoal analysis, and legacy data from prior slag analyses to illustrate the contrast in ironworking technologies at the two sites as well as differences in fuel preferences. Further, comparison with legacy paleoenvironmental data illuminates the relationship between the ironworkers at each site and their local forest landscapes.

**Lytle, Whitney (University of Texas, San Antonio)**

**[61]**

*The Ancestors You Choose: The Role of Predecessors at Xunantunich, Belize Group D*

Ancestor veneration was a cornerstone for Maya social organization and vital to the maintenance of hierarchy. As the Maya became more politically and socially complex, ritual practices involving ancestors also rose in complexity. Critical to the concept of ancestors is the recognition of the bond between ancestors and spaces. This paper explores the perceptions of "ancestors" through a case study of the Xunantunich, Group D eastern shrine and adjoining courtyard. Group D is an enduring example of power reflected in the creation and manipulation of space. The Late Classic period creators of Group D utilized the communal perception of an important ancestral space, a Late Preclassic hilltop shrine, to legitimize a new ritual location. All too often ancestors are characterized through kinship alone when reality indicates a multitude of definitions, manifestations, sociopolitical roles, and variety of ways in which they are incorporated in ritual spaces. Using evidence from Group D, I suggest ancestors should be understood as more complex characters that can be revered as ancestors of an entire community due to their significant contributions and not solely based on kinship ties.

**[61]**

*Chair*

**Maass, Claire**

**[112]**

*Moderator*

**Maass, Claire**

**[186]**

*Born into Captivity: Bioarchaeological Perspectives toward Enslaved Children and Childhood in Colonial Peru*

Children and childhood have emerged as important topics for understanding the history of African slavery in the Americas. In historical archaeology, analyses of subadult skeletal remains have provided valuable information about the biological and social conditions of captivity. However, in spite of these contributions, children are still infrequently posited as primary subjects of study in African diaspora bioarchaeology. Recent research at Hacienda La Quebrada, a late colonial sugar plantation in central Peru, brings new data to bear on these subjects. Drawing on five years of archaeological, bioarchaeological, and historical research at the site, this presentation explores how the environmental and social landscapes of plantation slavery impacted the lives of enslaved children in Peru's coastal sugar economy during the eighteenth and early nineteenth centuries. How were the social identities of enslaved children of African descent defined in this particular sociocultural context? In what ways did these perspectives shape their treatment in the plantation community? Finally, what impacts did these conditions have on the embodied experiences of enslaved children? By situating research findings in a child-centered approach, this presentation hopes to illuminate the embodied experiences and social agency of a group that is often overlooked in African diaspora scholarship.

**MacDonald, Brandi (University of Missouri Nuclear Research Reactor), Izumi Shimada (Southern Illinois University), Marco Fernandez (Bruning National Archaeological Museum, Peru), Rafael Valdez (Catholic University of Peru, Lima) and Ursula Wagner (Munich Technical University)**

**[16]**

*Sicán Sociopolitical Organization in Lambayeque, Peru: Ceramic Compositional and Distributional Perspective*

We report the results of a recent chemical compositional analysis (INAA) of ceramic samples from multiple Middle Sicán (ca. 1000 CE) sites in the Lambayeque region on the north coast of Peru that offer important insights on the Middle Sicán sociopolitical and territorial organization. The analysis is an integral part of our cross-disciplinary testing of the multi-lineage collective governance model. The model postulates that the polity was composed of six elite lineages that shared the same religion but each had its own distinct territory as well as workshops and other production setups that supplied its valued craft goods including fine ceramic and precious metal items. Analyzed samples of mostly fine, black ritual vessels were derived from two distant, excavated ceramic workshops of Huaca La Pava and Sialupe as well as two contemporaneous temple mound complexes of Huaca Loro and Huaca Lercanlech within the Sicán capital. INAA results indicate that both temples acquired their fine ceramics from both workshops albeit in somewhat different proportions. Additionally, a considerable compositional overlap between samples from the two workshops suggests that they may have shared the same paste recipe or paste itself. Implications of these finds will be discussed.

MacDonald, Brandi [182] see Shimada, Izumi

Macedo Molina, Lina [47] see Earle, Julia

**MacFarland, Kathryn (Arizona State Museum, University of Arizona), Arthur Vokes (Arizona State Museum, University of Arizona), Suzanne Eckert (Arizona State Museum, University of Arizona) and Patrick Lyons (Arizona State Museum, University of Arizona)**

[183]

*A New Fee Structure to Ensure Repository and Archive Sustainability*

For many decades, the Arizona State Museum (ASM) used a flat-rate curation model that proved unsustainable. It did not cover the costs of reviewing incoming materials for compliance with the Arizona Antiquities Act (AAA), preparing submissions for curation, or care in perpetuity. Furthermore, inadequate funding resulted in a storage space crisis and an intimidatingly large processing backlog, undercutting ASM's ability to meet its legal responsibilities and comply with ethical standards. An amendment to Arizona Revised Statutes § 15-1631 in 2016 required ASM to develop a new fee structure that would recover all costs and ensure ASM's ability to curate collections that, by state law, are in its care. The new fee structure, an effort-based model, coupled with an interest-bearing account designed to cover in-perpetuity curation costs, has been in effect for more than a year. In this paper, we discuss two ASM offices, the Archaeological Records Office and the Archaeological Repository, as case studies, describing for each: (1) the new fee structure in place; (2) the way the fee structure has been implemented; (3) the reverberating effects of this new, effort-based approach to curation at ASM; and (4) the efficacy of the new model for in-perpetuity curation and AAA compliance.

Machava, Sheila [124] see Muianga, Décio

Macias Quintero, Juan Ignacio [117] see Martínez de Luna, Lucha

**MacIver, Andrew (University of California, Los Angeles)**

[78]

*Affective Foundations: The Dissolution of Human Sacrifice under the Western Zhou, 1046–771 BC*

The transition from the Late Shang state (ca. 1300–1046 BC) based in Anyang to the Western Zhou state (ca. 1046–771 BC) founded in Shaanxi represents one of the most significant geopolitical and cultural transformations in ancient China. The conquest of the Shang by a Zhou-led alliance precipitated in the elimination of the human sacrificial rituals central to Shang hegemonic practices. I argue the rejection of these ritualized acts of violence by the Western Zhou is grounded in the affective ties produced within the extensive social networks situated within the Zhou homeland in Northwest China. Through these networks, the Zhou fostered a sociopolitical system founded on the social relationships and shared traditions among a diverse coalition of groups spread over an expansive geographic area. The dissolution of large state-sponsored human sacrifices under the Western Zhou was the result of a Zhou strategy of governance that relied on maintaining the alliances forged with these groups. To analyze this dissolution, this paper employs a comparative analysis of Shang and Zhou burial and ritual practices and a GIS-based analysis of the changes within the networks of interaction in North China during the late Shang and early Western Zhou periods.

Mackay, Alex [58] see Lin, Sam

Mackay, Alex [151] see Phillips, Natasha

Mackay, Alex [151] see Steele, Teresa

Mackertich, Samantha [29] see Barrett, Sophia

Mackie, Madeline [192] see Herron, Molly

Mackie, Madeline [28] see Ricketts, Macy

**MacMillan, Vincent (Canyons of the Ancients National Monument), Mark Varien (Crow Canyon Archaeological Center), Grant Coffey (Crow Canyon Archaeological Center), Steve McCormack (Caddis Aerial, LLC) and Daryl Crites (Caddis Aerial, LLC)**

[26]

*UAV Lidar Mapping Sand Canyon Pueblo: Technical Collaboration for Site Visualization and Reassessment*

The Research Institute at the Crow Canyon Archaeological Center partnered with Canyons of the Ancients National Monument and two private companies, Routescene Inc. and Caddis Aerial, to conduct a lidar survey of Sand Canyon Pueblo. The drone-based lidar data penetrates the dense vegetation present on the site to make a highly accurate map. This allows archaeologists and the public to better visualize the site and augments previous mapping efforts. Working together, we collected the data, finalized the site imagery, produced a video explaining the project, and published a description of the project that appeared in several venues. This poster details the work done as part of this project and focuses on new interpretations of the site made possible from the lidar work. We also describe how lessons learned from this project will influence the future use of this technology at other sites in the area. Finally, this project provides an important opportunity to augment and assess previous maps of Sand Canyon Pueblo produced by Crow Canyon during its excavations there from 1984 to 1993.

MacMillan, Vincent [53] see Palonka, Radoslaw

**Macrae, Scott (Trent University), Gyles Iannone (Trent University), Saw Tun Lin (University of Yagou) and Nyein Chan Soe (Yadanabon University)**

**[150]**

*Ancient Inscriptions and Climate Change: A Study of Water Management at the Ancient Capital of Bagan, Myanmar*

Bagan was an authoritative capital as well as a cosmological and ritual epicenter of Theravada Buddhism for the Classical Burmese Empire during the eleventh to fourteenth centuries CE. Integral in the Buddhist belief system is the notion of merit; achieved through good deeds or donations to the Buddhist Church. This often took the form of developing or renovating water management infrastructure throughout Bagan's peri-urban zone. These were important endeavors given the semiarid environment and limited water resources which characterize this region. This ancient landscape was further shaped by two climatic events during the occupation of Bagan: the Medieval Climate Anomaly (900–1300 CE) and Little Ice Age (1300–1570 CE). In this pursuit for merit, donations were inscribed on stone monuments endowing the donor with social recognition and spiritual benefits. Recorded within these stone inscriptions are references to types of water management features, construction techniques, locations, dates, donors, and recipients. The quantitative analysis of these inscriptions provides insight into the entangled relationships that developed between kingly authorities, religious institutions, and the broader support population in their journey for a successful water management strategy. This analysis will question the shifting management strategy in response to changing water availability due to climatic fluctuations.

**[150]**

*Chair*

**Maestri, Nicoletta (Universidad Nacional Autónoma de México)**

**[181]**

*Settlement and Mobility in Early Colonial Tabasco, Mexico*

One of the most pervasive changes in Mesoamerican early colonial period was the new form of urban and town configuration and their relations with the surrounding landscape. Native settlement abandonment, forced congregations, and changes in communication and trade routes profoundly transformed the mobility system of this territory. The coastal region of Tabasco-Campeche, for example, passed from being an area of important commercial routes and bustling trade centers, to be a rapidly depopulated and marginal frontier of the New Spain. Yet, this was the location of one of the first Spanish settlement in the Americas, Santa María de la Victoria, at the mouth of the Grijalva River, capital of the province of Tabasco for more than a century. Although no systematic archaeological work has been done to identify its exact location, the settlement was an important node in the system of riverine and coastal mobility of the region. Combining historical maps, colonial documents, and regional scale lidar, this paper presents some methodological approaches to reconstruct the role of this area in early colonial times, through the implementation of a Historical GIS project.

Maeyama, Kimberly [29] see Esh, Kelley

**Maezumi, S. (University of Amsterdam)**

**[165]**

*Discussant*

Magaloni Kerpel, Diana [180] see de Carteret, Alyce

**Magargal, Kate (University of Utah)**

**[175]**

*Limb for Limb: Risk and Firewood Acquisition in the Southwestern United States*

There are numerous dynamics of risk associated with acquiring any resource. The risk of investing time unsuccessfully, of incurring too great an opportunity cost, and of dangers to life or limb when venturing forth all come into play. How do these different types of risk trade off and how does a human in need of said resource navigate these dynamics? Firewood is one such resource where scarcity and intensity of need can combine to create a landscape of risk for those engaged in its harvest. This ethnographic study examines firewood harvest among Diné in southern Utah. In this case, woodlands are located a large distance from home sites, causing wood haulers to face several different elements of cost and risk in the pursuit of firewood. Using a combination of quantitative and qualitative ethnographic data, an analysis of the risk landscape for wood haulers is presented. Given the importance of firewood throughout human history, understanding the risk landscape of firewood will have many implications for archaeological interpretation.

**[175]**

*Chair*

Magargal, Kate [175] see Coddington, Brian

Magargal, Kate [54] see James, L. Brock

**Magoon, Dane (University of Leicester)**

**[163]**

*Powhatan's Pearls: Power, Prestige, Profit, and Identity in Coastal Virginia during the Late Woodland and Contact Periods*

While copper and shell beads have been focal topics within the region, as items of adornment and power during later prehistory, a review of early historic accounts indicates that freshwater pearls may have been the most valued of all such commodities, during

both life and death. Obtained locally, from the expansive waters of the inner coastal plain, freshwater pearls may have served as a symbolic marker of regional identity, with the event of finding of a significant pearl representing a powerful moment infused with manitou. These same pearls were targeted by English settlers as a potential means for making the Virginia Company profitable, underscoring their persistent presence in the early historic record. The quest for freshwater pearls may have served as a driving force behind Native American settlement within the inner coastal portion of the James River drainage during the Middle and Late Woodland periods, based on a potential knowledge of extra-regional trade networks and the ideal habitat conditions required by freshwater mussels, a resource viewed by many researchers as a starvation food. This presentation investigates the ephemeral presence and varied roles of freshwater pearls within the historic record and at Native American archaeological sites in coastal Virginia.

**Maier, Lisa (University of California, Berkeley)**

**[172]**

*Discussant*

**Mailler, Mary (Texas Tech University) and Spencer Mitchell (University of California, Santa Barbara)**

**[194]**

*Innovative GIS Mapping Approaches Further Support Historic Site, Etzanoa, Was Located at the Mouth of the Walnut River, Arkansas City, Kansas*

This analysis presents convincing evidence that the mythic city of Etzanoa locale can be confirmed as located at the mouth of the Walnut River, in Arkansas City as proposed by Dr. Donald Blakeslee in 2018. Satellite imagery, ESRI's GIS technologies, georeferencing, and comparative viewshed analyses conducted in geospatial environments offer new and innovative approaches to undertaking investigations of rare and antique maps of interest to cartographic historians.

**[194]**

*Chair*

**Makarewicz, Cheryl (Kiel University) and Iain Kendall (University of Bristol)**

**[93]**

*Pastoralist Intensification and Dietary Dynamics in the Mongolian Steppe: Multi-isotope Analyses of Human and Faunal Collagen*

The initial spread of pastoralism into the Mongolian steppe during the third millennium cal BC marked a major transformation in human subsistence. Dairying was practiced by early pastoralist groups, evidenced by the identification of milk proteins preserved in human dental calculus. However, we have a poor understanding of how the focused exploitation of animal domesticates impacted the relative contribution of animal proteins to early pastoralist dietary intake. Similarly, the degree to which later intensification in pastoral production associated with the Xiongnu Empire and the emergence of transregional exchange systems, as well as new dietary modes involving millet consumption, influenced the protein intake of established pastoralists is also unknown. Here, we investigate the dietary dynamics of Neolithic hunter-gatherers, Bronze Age early pastoralists, and Xiongnu herders through bulk carbon and nitrogen isotope analyses of human and animal remains recovered from mortuary monuments situated across the diverse environments of the Mongolian steppe. In order to decouple environmental inputs known to influence bulk isotope values, including aridity, which influences the distribution of nitrogen isotopes at the floral base of the food web, and establish if fish contributed to hunter-gatherer and pastoralists diets, we also conduct compound-specific isotope analyses of amino acids.

Maksudov, Farhad [92] see Frachetti, Michael

Maldonado, Antonio [47] see López Mendoza, Patricio

**Maldonado, Blanca (El Colegio de Michoacán, A.C.)**

**[170]**

*Ethnoarchaeological Research of Traditional Charcoal Production in Central Michoacán, Mexico*

Charcoal production along the region known as Bishopric of Michoacán, which included the modern states of Michoacán and Guanajuato, as well as parts of Jalisco, Colima, Guerrero, and San Luis Potosí, in Mexico, has changed very little since the arrival of the Europeans. The expansion of this traditional craft is linked to the development of the colonial mining industry from the early sixteenth century to the turn of the nineteenth century. The exploitation of mineral resources, including copper, gold, and silver, involved the use of charcoal to produce heat at numerous points along the extractive process. Charcoal makers represented a socially and ethnically diverse group whose composition captures the complex and diverse nature of the incipient colonial society. Today, charcoal represents an important source of energy in Central Michoacán and its surrounding regions; it is used primarily by the residential and food vending sectors. An ethnoarchaeological approach has been developed combining systematic research of written and oral data, as well as archaeological evidence, to investigate charcoal production in the region, and generate a historical and current assessment. The purpose of this paper is to present the preliminary results of this ongoing research.

**[170]**

*Chair*

Mallick, Soumen [148] see Steinman, Charles



**Mandel, Rolfe (Kansas Geological Survey)****[172]***Discussant*

Mandel, Rolfe [6] see Niquette, Richard

**Manfio, Stefania (Stanford University)****[185]***Moderator*

Mangado, Xavier [77] see Sánchez de la Torre, Marta

**Manney, Shelby (Joint Force Command - US National Guard)****[49]***Chair*

Manney, Shelby [49] see Heilen, Michael

**Manning, Sturt (Cornell University)****[130]***With Precision Comes Variability: Complications in High-Resolution <sup>14</sup>C Chronology in the East Mediterranean-Middle East*

Recent years have seen major developments in accuracy and precision for several aspects of radiocarbon dating. There is a new annual-resolution (last 5K) Northern Hemisphere calibration curve, increased focus on sample selection and processing (chronometric hygiene), and widespread application of sophisticated Bayesian chronological modeling methods, all aimed at achieving high-resolution dates and chronologies. With increased precision, issues of variability become more clear and substantive. Inter-laboratory and inter-technology differences are one concern. Another area that has not yet received sufficient attention is whether a single radiocarbon calibration curve is appropriate for all the mid-latitude regions of the Northern Hemisphere. Theory and observation suggest not. This becomes a tangible problem as measurement precision has increased and high-resolution is the aim. The different growing seasons of plants can be sufficient to raise complications. This paper considers the east Mediterranean-Middle East region as an example where these issues can be relevant at high-resolution, and discusses the nature of the problems. Such problems are also relevant elsewhere (e.g., North America), as increasingly sophisticated and high-resolution chronologies are constructed in different regions.

Manning, Sturt [130] see Birch, Jennifer

Manosalvas, Felipe [90] see Vargas, Juan Pablo

Manrique-Ortega, Mayra [177] see Cruz Jimenez, Ricardo Leonel

**Mantilla Oliveros, Johana Caterina (Universität zu Köln, Germany)****[186]***Landscapes of Mobility and Freedom: Maroonage and the Making of the New World*

Francisca Angola, a creole woman of the seventeenth century, was born in one of the *palenques* (maroon settlements) of the north coast of Colombia. Her mother, Lucia, and her father, Agustin, both identified as Angolas, ran away from Cartagena at the beginning of the same century. At the probable age of 70, Francisca and some of her descendants were caught by Spanish soldiers after a military entrance into her *palenque* and taken to Cartagena for a trial. Francisca's declaration offers a glimpse into the dynamics of mobility, social relations, and daily life of the maroons of the second half of the seventeenth century. Based on colonial written sources, material evidence recovered through archaeological surveys, and spatial analysis, I propose a discussion about the role of belonging linked to the emergence of a particular landscape of maroonage during the seventeenth century. On one hand, the emergence, abandonment, and reemergence of *palenques* in the same areas show that mobility was a decisive tactic probably linked to the memory of the ancestors. On the other, the coexistence of different *palenques* with a defined military and social structure reinforced a sense of belonging, while granting the access and control of the land.

**Manzanilla, Linda (Universidad Nacional Autónoma de México)****[50]***The Palace of Xalla at Teotihuacan: An Overview of a Multifunctional Palace*

The palace of Xalla is located between the pyramids of the Sun and the Moon. It is a 55,000 m<sup>2</sup> palatial complex with plazas, structures, rooms, porticoes, and patios, surrounded by a double wall for patrol walk. It has been excavated extensively by Linda R. Manzanilla and her team from 2000 to 2020, particularly in the central portion of the palace. Different functional sectors have been individuated: (1) An important ritual sector in the center of the palace, with four equivalent structures surrounding a temple. Each of these structures is dedicated to a different deity: the Thunder God, the Fire God, the Mountain God, and the Goddess of Flowing Waters; (2) To the south, there is a huge plaza devoted to craft-production, and in the northeast, to the military guard of the palace;

(3) An important domestic sector was individuated from 2012 to 2019 between the ritual sector and the craft-production sector; (4) To the northwest, there is an important ritual tumulus that displays a wide variety of faunal remains, as well as many sumptuary goods. It also displays the treasuring of mica plaques. I will emphasize the possibility that this palace housed two of the co-rulers of Teotihuacan.

[50]

Chair

Manzanilla, Linda [50] see Beramendi-Orosco, Laura

Manzanilla, Linda [50] see López-Puértolas, Carlos

Manzanilla, Linda [50] see Rosado-Fuentes, Alejandro

**Manzanilla Lopez, Ruben (DSA-INAH)**

[63]

Chair

Manzanilla Lopez, Ruben [63] see Cantoral Herrera, Jesus

**Manzano, Bruce (Western Kentucky University) and Renee Bonzani (University of Kentucky)**

[64]

*Hands-On Archaeological Pedagogy: A Case Example of Teaching Food Pathways in Ancient and Modern Times*

Active participation and hands-on analysis and activities in college-level classes can draw students with diverse interests into classes of archaeology. To move away from straight lecturing about archaeological principles, the authors developed a class on paleoethnobotany and zooarchaeology that actively involves students working in groups to understand the principles and methods of these fields of study and gives them the opportunity to analyze the archaeological remains themselves. Group work also investigates the cultural uses and nutritional values of the botanical and faunal resources identified and develops new business strategies to utilize the resources in modern markets. Students with varying majors have taken the class over the last four years. An outline of the class design and statistics on students' declared majors will be presented.

Manzano, Bruce [91] see Pollack, David

Marceau, Tom [39] see Hackenberger, Steven

**Marciniak, Arkadiusz (Institute of Prehistory, University of Poznan)**

[72]

*The Human-Mediated Evolution of Cattle and Its Impact on Cattle-Based Agriculture in the Neolithic of the Polish Lowlands*

Cattle were the most important domesticated animal in the Neolithic of the Polish lowlands. The paper will explore the character of human-mediated evolution of cattle following rapid development of Neolithic groups in the region, the need of adaptation to new ecological niches and the strain caused by climate change and human induced environmental pressure. It will present the temporal trajectories of key genetic changes, in particular the beginning of the process resulting in the emergence of productive strains that paved the way for development of cattle breeds known for effective meat and milk production. Genetic variation between cattle populations in the region will be compared with their different morphotypes, as revealed by the variation in size and shape of bones using traditional biometric methods, including Logarithm Size Index, and 3D geometric morphometrics applied to astragali. The paper will then scrutinize a significance of these developments for changes in the character cattle-based agriculture in the Neolithic of the Polish lowlands.

Marciniak, Arkadiusz [168] see Kuijt, Ian

Marean, Curtis [173] see Coon, Sarah

Marean, Curtis [40] see Fahey, Brian

**Marengère, Véronique (Université Laval, Centre d'études nordiques), Kevin Smith (Haffenreffer Museum of Anthropology, Brown University) and James Woollett (Université Laval, Centre d'études nordiques)**

[148]

*What Does a Fire Giant Eat? A Zooarchaeological Analysis of Surtshellir's Burnt Faunal Remains*

In the ninth and tenth centuries CE, a very distinctive and unique site was established inside the cave of Surtshellir. This lava tube was reputed to be the home of the mythological fire giant, Surtur and has been studied over the course of several years by a team led by the Haffenreffer Museum (Brown University), Þjóðminjasafn Íslands, and Minjastofnun Íslands. Within this cave, various and unique artifacts have been found alongside massive piles of faunal remains and burnt bone fragments associated with a boat-shaped structure made of stone. This paper will report on ongoing analyses of burnt bone remains found inside Surtshellir during the 2013 campaign. Through experimental archaeology and analysis of taphonomic traces, the study seeks to determine how faunal remains were treated. Through correspondences between their spatial distribution and the artifacts found on site, we will also attempt to evaluate current hypotheses regarding the use of burnt animal bones. Are they remnants of ritual offerings and sacrifices made to Surtur, leftover meals or were they simply used as fuel?

**Marengo, Nelda Issa (University of California, Riverside), José Osorio León (INAH, Yuc) and Francisco Pérez Ruíz (INAH, Yuc)**

**[154]**

*The Funerary or Nonfunerary Human Assemblages from the Initial Series Group at Chichen Itza*

Human skeletal assemblages from Chichen Itza and its surrounding regions are complex, which makes Chichen Itza a prime location to study mortuary practices. The complexity stems most likely from Chichen Itza's multicultural relationships with other groups not only within the Yucatán Peninsula but throughout Mesoamerica. Despite having knowledge of the intricacies of their mortuary practices, domestic funerary systems are unknown at Chichen Itza due to the scarcity of excavations of domestic areas. However, excavations in the Initial Series Group, in which we expected to uncover domestic funerary practices, revealed nondomestic funerary patterns that show hardly any ancestral treatment of the dead, which makes us question about the wares about Chichen Itza's ancestral motivated practice. For this study, the archaeological context of the interments of the Initial Series Group was compared with, 283 individuals from Chichen Itza, and systematically examined through bio-vital profiles, segments selections, and spatial analysis. These analyses reveal defleshing, flaying, artificial fragmentation, cremation, and roasting among the nonfunerary assemblage of the Initial Series Group.

**Margotta, James (Wheaton College Massachusetts)**

**[37]**

*The Forest for the Sites: Archaeological Heritage and Contestation in Gila National Forest*

The national forests of the United States represent a highly contested cultural space, where narratives of archaeological heritage, stewardship, wilderness, and more intersect and clash in the present day. For two previous field seasons (2018 and 2019) the Upper Gila Preservation Archaeology (UGPA) field school, run jointly by Archaeology Southwest and the University of Arizona, has conducted archaeological surveys of Lincoln Canyon in Gila National Forest. These surveys have helped to establish the cultural history of the national forest and have greater implications for discussions of contemporary cultural heritage in the region. This poster presents the results of research done using the UGPA survey data, alongside a myriad other methods such as discourse analysis and interviews relating to Gila National Forest in order to examine the complicated relationship between the ongoing narratives. Beyond highlighting the place of national forest archaeology in cultural heritage discourse, this research offers insight into potential dialogic and practical improvements to future heritage work in the forests through the application of emergent frameworks, such as critical heritage theory and archaeological ethnography.

**Marino, Marc (University of Arkansas), Lane Fargher (CINVESTAV del IPN) and Angelica Costa (SEARCH Inc.)**

**[181]**

*Collective Action, Households, Neighborhoods, and Urban Landscapes: A Multiscalar Perspective on Late Postclassic Urbanism at Tlaxcallan*

Systematic cross-cultural research on premodern cities at the global scale has begun to shed light on the relationships among political-economic strategies at various scales, the sociospatial organization of cities, and the daily lived experience of urban residents and visitors. Drawing on these insights, we examine the construction of, and the daily-lived experience in the Late Postclassic city of Tlaxcallan from the household, the neighborhood, and the settlement scales. In order to do this, we look, first, at the spatial organization and construction of the city from a top-down perspective, starting with the central political apparatus. We, then, repeat this analytical process, but work from the bottom-up, starting at the household scale using various geostatistical techniques. This approach allows us to understand (1) how urban planners confronted the intersection of collective political-economic strategies with the undulating topography of a hilltop setting; (2) how Tlaxcaltecs engaged with and participated with this vision in the construction of residential terraces, public spaces, and neighborhood; and (3) how the resultant urban landscape affected life in the city.

Marino, Marc [71] see Fargher, Lane

**Marken, Damien (Bloomsburg University)**

**[56]**

*Discussant*

**Marken, Damien (Bloomsburg University), Matthew Ricker (NC State University) and Robert Austin (NC State University)**

**[152]**

*Filled to the Brim: Estimating Lowland Maya Reservoir Capacities by Combining Survey, Soil Cores, and GIS*

One of the limiting factors to settlement aggregation in the Maya lowlands is the availability of potable water. With few perennial surface rivers and lakes, the ancient Maya collected water from rainfall for consumption. In areas with high population densities, such as Classic period cities, this required engineering the built landscape to funnel water for collection and storage to various types of basins and formal reservoirs. This paper presents the results of a multiyear project collecting and analyzing surface and subsurface topographic data to improve methods for estimating the capacities of these water catchment features at the Classic Maya city of El Peru-Waka', Petén, Guatemala. Typically, reservoir capacity estimates in the Maya area rely upon mapped surface topography to estimate storage volumes and occasionally employ subsurface excavations to increase depth measurements. The present study integrates data from terrestrial and lidar mapping with soil core transects to model the subsurface topography of a sample of reservoirs with GIS tools to more accurately estimate holding capacities at or near their time of use.

**Markens, Robert (Instituto de Investigaciones Estéticas, Universidad Nacional Autónoma de México) and Cira Martínez López (INAH)**  
**[102]**

*Lambityeco Oaxaca and Domestic Organization during the Xoo Phase*

This paper focuses on domestic household organization at the Late Classic period site of Lambityeco in the Valley of Oaxaca and complements the important work of Michael Lind on political organization there. Excavations carried out at Lambityeco in 2002–2003 under the auspices of INAH explored 17 commoner houses, 9 tombs, and 36 burials at the site and recorded information on economic specialization, burial practices, and the household developmental cycle.

**Marquardt, William (University of New Mexico; US Forest Service) and Jana Valesca Meyer (University of New Mexico)**  
**[27]**

*GIS Analysis of Surface Lithic Scatters in the Northern Blue Mountains: Local and Regional Contexts*

Lithic scatters are by far the most common precontact archaeological site in the Blue Mountains of northeast Oregon and southeast Washington. These sites are frequently situated in open, flat areas adjacent to a reliable source of water and are broadly interpreted as being related to the seasonal round of resource gathering practiced by indigenous peoples of the Columbia Plateau from time immemorial to the present day. Despite their ubiquity, interpretation of site function, chronology, and significance remains difficult in both a cultural resource management (CRM) and academic context. Utilizing Geographic Information Systems (GIS) technology, this poster addresses a series of lithic scatters in the Wenaha-Tucannon Wilderness in what Chartkoff (1995) terms a “nested hierarchy of contexts” from intrasite site structure to regional interaction. Preliminary results of these analyses suggest three broad patterns of utilization and organization for these sites across time. First, sites in the Wenaha-Tucannon appear to be organized around central camps with distinct activity areas. Second, while andesitic basalt forms the bulk of lithic debitage and finished scrapers, finished projectile points are overrepresented by nonlocal material. Third, the Wenaha-Tucannon area appears to have been utilized by people from both Plateau and northern Great Basin culture groups contemporaneously.

Márquez Huitzil, Ofelia [119] see Amador, Julio

**Marroquín, Jaime (Western Oregon University) and Jamie Ford (University of Edinburgh)**  
**[180]**

*Utopia through the Kaleidoscope: The Colors of Silk in Colonial Mexico*

Following the arrival of Europeans to the New World, one of the most fascinating early exchanges of knowledge and technology that ensued was the introduction of the silk industry to Mexico. While in some places this was unsuccessful and/or short-lived, particularly in Oaxaca, it flourished for the better part of a century. For Franciscan and Dominican missionaries, silk presented an economic commodity key to realizing their vision of a Catholic Utopia that they would build in a land that they viewed as almost perfect for the renewal of Christianity. Meanwhile, Indigenous communities not only raised and sometimes reeled the raw silk thread that was subsequently woven in colonial craft guilds, but they were also active consumers of their own finished silk products, particularly sumptuous liturgical vestments of diverse and brilliant colors. As these elaborate textiles adorned sixteenth-century churches, they also exemplified some of the many ways in which a different concept of Utopia, one akin to prehispanic notions of a “Flowery Heaven,” developed. In this paper, we draw from textual and visual evidence to trace out how silk tied together these different yet profoundly interwoven utopian visions.

Marsh, Erik [45] see Roddick, Andrew

**Martin, Debra (University of Nevada, Las Vegas)**  
**[79]**

*Discussant*

**Martin, Debra (University of Nevada, Las Vegas)**  
**[127]**

*Discussant*

Martin, Debra [26] see Edmonds, Emily  
 Martin, Debra [127] see Ralston, Claire  
 Martin, Debra [78] see Taylor, Katie

**Martin, Lois (Fordham University)**  
**[139]**

*Symmetries of Corn and Cloth in the Ancient Americas: Pattern Generation, Botany, and the Maize Matrix*

Several precolumbian royal garments with simple, repeating geometric designs have explicit associations to maize, and hint at a deep significance to the cloth pattern–corn plant connection. In the Andes, Inca Coyas (noblewomen) wore special woven belts during the annual corn-planting ceremony. Sophie Desrosiers deciphered Murúa’s colonial-era code for the belt pattern in the 1970s, replicated the design, and located a few museum specimens. In 2002, Lynn Meisch encountered weavers in highland Peru still producing almost identical “Sara” belts, named after the “Mama Sara,” an oversized corncob. In Mesoamerica, likewise, the Aztec *tlatoani* (king) wore a blue-green mantle with a dotted-diamond grid design (*xiuhtlapilli tilmatl*); it belonged to a maize-inspired panoply of regalia worn and wielded by Mesoamerican sovereigns for millennia, including sprout-shaped crowns, leaf-like quetzal

plumes, dewdrop-like jade beads, and cob-like greenstone celts. Aztec maize goddesses and their impersonators wore similarly decorated fabrics, but in white or reddish tones. Maize was fundamental to precolumbian societies, so regents sought to associate themselves with its promise through dress. This investigation addresses the multiple visual, dynamic, and metaphorical correspondences that link these textile patterns to maize, especially to the mutated and twinned cobs symbolic of extraordinary potency.

[139]

*Chair*

**Martin, Melinda**

[51]

*Whirlwind of Power: Mississippian Tornado Iconography and Mythology*

Mississippian cosmologies were inextricably entangled with the sacred environment and landscape, often materialized through iconographic imagery and motifs. One example of such interwoven relationships may be seen in the imagery of other-than human beings; that is, preternaturals who control and often manifest themselves as weather phenomena. Examples of known weather spirits include Thunder Boy and Lightning Boy, Thunderbirds or Thunderers, and underworld water spirits, including Cat Serpents and the Great Serpent. However, one powerful weather phenomenon remains elusive in the archaeological record, although it frequently appears in ethnohistoric accounts as the provider and destroyer of life with the ability to transcend the Upper, Middle, and Lower worlds, in addition to functioning as an axis mundi. I argue that through the supplication of a tornado deity, elites demonstrated their association with powerful weather phenomena. In this presentation I suggest that the Master of Breath, referred to as a whirlwind in the American Southwest, is a key deity in Mississippian weather cosmology, and that tornado iconographic references are visualized in rock art, ceramic vessels, and marine shell media.

Martin, Richard [38] see Lilley, Ian

Martin, Samuel [191] see Bowland, Lucyna

**Martin, Simon (University of Pennsylvania Museum)**

[76]

*Discussant*

Martin, Simon [76] see Beliaev, Dmitri

Martin, Terrance [105] see Painter, Autumn

Martin-Apostolatos, Gwen [167] see Trusler, Kate

**Martindale Johnson, Lucas (Far Western Anthropological Research Group Inc.) and Adrian Chase (Arizona State University)**

[181]

*Examining Flaked Stone from Caracol, Belize, at the Urban Scale*

Household and city scales are typical units of archaeological analysis at Maya sites. More recent models of urban space include intermediate scales referred to as "neighborhoods" that encompass clusters of households and "districts" that effectively integrate neighborhoods. Using flaked stone data from Caracol, Belize, both craft producers and consumers within these scales are examined to evaluate household activities relative to how cities operate to provision themselves with necessary daily resources. Topics such as market and nonmarket economies are addressed as well as the depositional patterns of secondary refuse disposal and intentional ritual offerings.

Martindale Johnson, Lucas [7] see Davis, Mary

**Martinez, Desireé (Cogstone Resource Management)**

[160]

*Discussant*

Martinez, Desireé [25] see Lippert, Dorothy

Martinez, Gustavo [48] see Hansen, Richard

Martinez, Gustavo [48] see Ortega, Edgar

**Martinez, Kailey (New Mexico State University)****[72]*****Balance on South Diamond: Using Faunal Analysis to Understand Biodiversity and Resource Use Trends in the Northern Mimbres Region***

The Gila National Forest/Wilderness comprised of rich mountainous land spanning between western New Mexico and eastern Arizona. This land was once home to the people of the Mimbres culture. The environments within these natural areas vary due to different altitudes and precipitation, which also affect the variety and amount of ecological resources. Two sites that have been excavated in the Northern Mimbres region by New Mexico State University students, professors, and volunteers include South Diamond Creek Pueblo (SDCP) and Twin Pines Village (TPV). Both settlement size and resource availability would have worked to dictate what resources were being exploited on each site. Beyond just these two sites, the differences of resource availability within the Northern Mimbres region and other Mimbres occupied areas outside of it may also be apparent within the archaeological record. The goal of the study is to determine if diversity trends and species abundances from the faunal assemblages of SDCP and TPV are similar to or different from other Mimbres sites of the same time range and to determine if it is possible to accurately estimate what transitional phase of the adaptive cycle these sites were in during the Classic Mimbres Phase.

Martinez, Maria [77] see Brandl, Michael

**Martinez, Valentina and Andres Garzon (Florida Atlantic University)****[149]*****Landscapes, Architecture, and Settlement Patterns: Reflections on the Territorial Expansion of the Manteños***

Considering Smith's (2007) comparative approach to ancient urban planning, this paper suggests that starting ca. 1200 CE the Manteño engaged in a process of increased growth and expansion that led to a shared, standardized settlement strategy across an environmentally diverse area. This shared settlement strategy reflects a complex process of continuous coherence of Manteño communities into a larger social unit. This is evident in the large-scale terrain modifications and thousands of stone foundations found across the diverse landscapes of Manabí. Our work in the cloud forests of El Pital shows that the Manteño extensively modified marginal settlement areas such as the rugged slopes and deep cut valleys of the Paján Mountains to accommodate a growing population. We explore this shared settlement strategy by analyzing commonalities and differences in viewshed, access, and architecture between El Pital and other key Manteño settlements in different environments and elevations. The political and social implications of this study are addressed as well, contributing to the expanding literature of complex societies and settlement patterns in the New World's neotropical regions.

**[149]***Chair*

Martinez, Valentina [149] see Ayers-Rigsby, Sara

**Martínez-Carrasco, Andrea (University College London), Constanza Cortés (Universidad Austral de Chile), Daniel Pavlovic (Universidad de Chile), Cristian Dávila (Investigador Independiente) and Rodrigo Sánchez (Universidad de Chile)****[157]*****Cultura material y agencia local en Chile Central en los tiempos del Inka***

Las evidencias indican que el uso de actividades de amplia convocatoria asociada a prácticas ceremoniales fue una estrategia fundamental para la integración de las cuencas de los ríos Aconcagua y Maipo-Mapocho (Chile central) al Tawantinsuyu. La cultura material permite inferir la participación de comunidades locales en las instancias de negociación política propiciadas y articuladas por el Inka. A su vez, evidencia la introducción, por parte de sus representantes, de principios ideológicos e innovaciones técnicas (p.e., arquitectura en piedra, metalurgia). No obstante, se reconoce una fuerte continuidad con respecto al periodo previo de las tradiciones tecnológicas locales, que se manifiestan principalmente en la esfera doméstica. En espacios de congregación, la tradición alfarera local incorpora formas Inka ligadas principalmente al comensalismo político. Su presencia usualmente asociada a sitios funerarios en los valles y complejos arquitectónicos sobre cerros, la continuidad de los estilos cerámicos locales, y la aparición de nuevas formas y decoraciones, denotan diferencias en los niveles de aceptación, resistencia y apropiación, por parte de las poblaciones locales al nuevo orden. Estas reacciones estarían ligadas a su territorialidad e influenciadas por su contexto sociopolítico previo, dando cuenta de la agencia local en la producción y uso de estas materialidades.

**Martínez de Luna, Lucha (UCLA) and Juan Ignacio Macías Quintero (Universidad de las Ciencias y Artes de Chiapas)****[117]*****O'na Tök: A Preclassic Zoque Center in Western Chiapas, Mexico***

Preliminary explorations at the previously unknown Zoque site of O'na Tök reveals within a mid-montane wet forest, a multifaceted archaeological landscape containing an early ceremonial center, an expansive area of long architectural platforms, and nearby caves used for ritual purposes. Artifacts recovered on the surface suggest occupation during the Early Preclassic until the Postclassic period. The site's architectural layout does not correspond with similar patterns often associated with other contemporary sites, specifically during the Middle Preclassic period, suggesting the center played a distinct role in the region. Test pits in the ceremonial center have revealed two distinct stratigraphic layers of occupation dating from the Early Preclassic and Middle Preclassic. The excavations also uncovered a Preclassic midden with large quantities of ceramics, suggesting distinct diacritical feasting events. Material cultural assemblages consist of high-quality cooking and serving vessels, food refuse, lithics, figurines, obsidian from several sources, and luxury trade goods. These data suggest that the occupants actively participated in interregional interactions and exchange between centers in the Gulf Coast, the Central Depression of Chiapas, extending as far as Central Mexico and Guatemala, with the site of O'na Tök functioning as a primary center along a previously unknown exchange corridor in Chiapas.

Martínez López, Cira [102] see Markens, Robert

Martínez López, Cira [171] see Minc, Leah

**Martínez Martínez, Xóchitl (INAH), Dante García (INAH) and Eduardo García Wiguera (INAH)**  
[82]

*Reconstrucción arquitectónica del Edificio P de Monte Albán, una visualización del pasado desde las herramientas digitales*

Las exploraciones arqueológicas del Edificio P de Monte Albán, enmarcadas en el Proyecto de Conservación de los Edificios dañados por los Sismos del 2017 en Monte Albán-Atzompá, han permitido identificar evidencias arqueológicas que muestran las etapas y sistemas constructivos que se realizaron en el mismo entre el Clásico Temprano (300–650 dC) y el Clásico Tardío (650–950 dC). El empleo de nuevas tecnologías para el registro puntual de la evidencia arqueológica ha permitido conocer el complejo sistema arquitectónico empleado. El posterior procesamiento de los datos en diferentes programas de software, permiten crear y presentar modelos 3D con los que se logra la reconstrucción arquitectónica de las últimas etapas constructivas y el proceso de los daños graduales que sufrió este importante templo a partir de su abandono.

**Martínez Milantchi, Maria Mercedes (British Museum), Alice Samson (University of Leicester), Jago Cooper (British Museum), Michael Charlton (University College London) and Carlos Pérez (Instituto de Cultura Puertorriqueña)**  
[96]

*A Material Science Consideration of New World Encounters: Multi-method Approaches to the Archaeology of the Caribbean*

Following a recent review of excavated materials from the island of Mona (Puerto Rico), this paper examines the transformation of cultural and technological practices brought about by New World encounters. We focus on the affective material conditions that emerge in the sixteenth-century Caribbean by applying a materials science approach to the newly integrated materials in archaeological contexts. This sheds light on the interaction between the newly arrived European and local Taíno populations. From the recycling of iron ship nails in local structures to the refashioning of glazed ceramics into indigenous spindle whorls, this study reconsiders the agency that local Indigenous populations exercised by integrating aspects of European material cultures into traditional and transforming lifeways. Importantly, this paper raises questions about the brokering between experience and resistance in these complex spaces of interaction and exchange.

Martínez-Tagüña, Natalia [175] see Pailles, Matthew

Martínez Torres, Damian [82] see Frykholm, Soren

**Martos, Luis (INAH) and Sergio Grosjean (Grosjean Expedition Association)**  
[158]

*An Introduction to Chan Xaan Cave, Cuzamá, Yucatán, Mexico*

The “*ejidatarios*” of Cuzamá in Yucatán have developed a community tourist complex on the lands of the ancient hacienda of the same name, where they opened three cenotes. This work presents the first results of a survey carried out in a recently discovered cave and cenote known as Xaan Chan, where there are notable paintings that seem to date from Postclassic times.

**Marwick, Ben (University of Washington) and Pham Thahn Son (Institute of Archaeology, Hanoi, Vietnam)**  
[74]

*An Update on the Sonvian-Hoabinhian Controversy: Shape Analysis of Flakes and Cores from Mau A, Northern Vietnam*

Understanding stone artifact variation in northern Vietnam can be challenging because of the underspecified cultural taxonomies that have dominated analytical frameworks. For example the Hoabinhian is often thought to be a descendant taxa to the Sonvian. Our recent excavations at Mau A challenge this sequence. We apply statistical shape analysis methods to overcome previous limitations relating to subjective and irreproducible stone artifact classification methods. We clarify the definitions of Sonvian and Hoabinhian technologies, present new radiocarbon ages, and provide a new framework for explaining the variability of these technologies.

**Marwick, Ben (University of Washington)**  
[162]

*Moderator*

Marwick, Ben [144] see Chen, Yichun

Marwick, Ben [173] see Wang, Li-Ying

**Mason, Owen (INSTAAR, University of Colorado)**  
[179]

*The Birnirk/Thule Migrations: Pushed from an Overpopulated Bering Strait Dominated by Old Bering Sea Culture*

A climate-driven eastward push of Thule migrants remains axiomatic to many arctic archaeologists, associated with presumed warming weather of the Medieval Climate Anomaly (MCA), by tradition dated ca. AD 1000. Thule researchers implicated a rapid migration by rapacious “over-killing” seal-hunters and whalers entering unoccupied landscapes—increasingly insupportable on

ecological grounds, confounded by contemporaneous Dorset communities ca. AD 1300. New data from regional paleoclimatic proxies (beach ridges and glacial varves) indicate a cooler MCA. The western arctic Thule data include deep middens and hundreds of burials; some include offerings conveying the factors for emigration: status differentiation and social inequality. Locally, overpopulation can be inferred from cemeteries near Utqiagvik (Barrow) and Pt. Hope. A Thule iron trade with the Norse or Dorset cannot be substantiated as a pull factor since Greenlandic metal is absent west of Canada and ivory carving declined. Recalibrating the extensive radiocarbon chronology (>150) places the eastward Thule migration during a cool thirteenth century within a political landscape indicating that ancestral Thule societies, Birnirk or Punuk, arose within a Bering Strait still dominated by Old Bering Sea societies. Five discrete migrations of Birnirk, Punuk, or Thule groups occurred from Bering Strait, including the inland Arctic Woodland and Brooks Range movements.

Mason, Owen [179] see Alix, Claire  
Mason, Owen [179] see Taieb, Juliette

**Massey, David (Indiana University, Bloomington), Christina Friberg (Indiana University, Bloomington), Quinn Lewis (University of Waterloo) and Edward Herrmann (Indiana University Museum of Archaeology and Anthropology)**

[52]

*Measures of Influence: Volumetric Assessment of Earthworks at Angel Mounds Using Drone-Based Lidar*

Angel Mounds State Historic Site, a Middle Mississippian fortified mound center along the Ohio River, is home to 11 man-made earthworks which make up the largest known archaeological site in Indiana. Angel's occupation coincides with the regional changes in social organization that characterize Mississippian society. Many archaeologists have discussed mound volume as a proxy for complexity, but calculation methods and interpretations are varied and outdated. Increased accessibility to drone-mounted remote sensing technologies has provided archaeologists with unprecedented control over the frequency and spatial resolution of data collection. This trend toward "personal" remote sensing enables the use of noninvasive, cost-effective survey methods in challenging landscapes, and provides more precise and accurate measurements than traditional aerial methods. In this paper we compare airplane-based lidar and drone-based lidar data and calculate the volume of earthworks at Angel Mounds State Historic Site using a combination of GIS and lidar software (ArcPro, Quick Terrain Modeler, and FUSION). These findings are extrapolated to assess labor investments for the mound's construction and implications for the degree of sociopolitical complexity among Angel's earliest inhabitants.

[52]

Chair

**Massey, Sarah (Independent Researcher)**

[128]

*Tajahuana: New Insights into a Familiar Paracas Site*

The Paracas site of Tajahuana in the middle Ica Valley has been associated almost exclusively with the occupation of its summit known as La Peña. La Peña de Tajahuana was described by Menzel, Rowe, and Dawson as an important urban center corresponding to Phase 9 of the Ocucaje Sequence of Paracas pottery. Among the notable features of the summit is a series of earthen walls described by Rowe and other scholars as fortifications. The presence of the walls and the position of large terrace units on the upper slopes contributed to speculation concerning the existence and impact of intergroup conflict during the Late Paracas and Initial Nasca periods. PIA Tajahuana began in 2019 with the purpose of understanding further sociopolitical structure and interaction during the Late Paracas. Evidence from the first season of investigation suggests that the occupation of Cerro Tajahuana began earlier than previously thought and that the construction and occupation of the summit was not a single phase event but, reflected a long history of interaction between the residents of the lower slopes and those occupying the summit. This paper examines the preliminary evidence for site growth over time and establishes a chronological framework for its occupation.

Massigoge, Agustina [28] see Gutierrez, Maria

**Masucci, Maria (Drew University)**

[149]

Discussant

Mataloto, Rui [10] see Soares, Justin

Mathien, F. Joan [46] see Munro, Andrew

**Mathwich, Nicole (San Diego State University) and Carlos Figueroa Beltran (San Diego State University)**

[184]

*Situating Rancho Johnson: Landscape Transitions in Baja California*

The US-Mexico borderlands have been shaped by cultural exchange, binational power dynamics, and its unique ecosystems. This paper explores the political ecology of landscape transformations in northwestern Baja California in the nineteenth century at the site of Rancho Johnson, located near Punta Colonet and today a working ranch. In the nineteenth and early twentieth century, it served as an important stopping point for travelers on a major route in Baja Peninsula. Rancho Johnson was an Anglo-owned ranch and a site where technological improvements from the United States and Mexico were introduced. In this paper, we examine features at



the site reflecting introduced improvements and their impacts on the surrounding coastal desert landscape. Using surveys, historical photographs, and journals, we reconstruct a timeline of changes and compare them to political and economic initiatives in Baja California. We demonstrate how the construction of a distillery, the introduction of water pumping technologies, and expansion of cattle grazing were tied to larger social changes in the Peninsula. These technological introductions, fueled by political and social shifts in Baja California, provided early support to tourism in the region and had lasting impacts on the coastal desert ecology.

**Matsumoto, Go (Yamagata University)**

[69]

*The Mochicas under the Lambayeque Rule*

Recent studies have revealed that the Lambayeque society, primarily during the Middle Sicán period (AD 900–1100), was highly stratified and multiethnic. It is now inferred that the society was governed by a federation of the Lambayeque elite lineages, whereas the non-elite groups of other cultural identities (e.g., Mochica and Gallinazo) coexisted, given a substantial degree of autonomy under the Lambayeque dominance. In order to achieve a holistic understanding of the social dynamics of this society, therefore, it is essential to integrate the perspectives of the ruling and the ruled and emphasize both inter- and intragroup variability. This presentation will focus attention on the largest ceremonial site during the time, Huacas de Sicán (conventionally known as Batán Grande Archaeological Complex) located in the middle La Leche Valley, and explore the multiethnicity of the Lambayeque society with the results of surface survey and mortuary analysis at Huaca Arena and of the morphological analysis of ceramics excavated from the Great Plaza.

**Matsumoto, Mallory (Brown University)**

[189]

*Hieroglyphs and Hegemony in the Classic Maya Kingdoms of Piedras Negras and Yaxchilan*

The area stretching from the Usumacinta River basin in western Guatemala into the highlands of Chiapas, Mexico, hosted key centers of Classic Maya political and cultural life (ca. 250–850 CE). Scribes and sculptors active across the region produced hundreds of stone monuments inscribed with texts in a common hieroglyphic script. Yet little is known about how these artisans, working in different times and places, acquired, and shared knowledge of what and how to write, or how this exchange was inflected by other aspects of inter-polity interactions. This paper presents preliminary results from paleographic analysis to identify patterns of written variation reflecting scribal change and exchange. It examines Late Classic hieroglyphic monuments from Piedras Negras and Yaxchilan, two antagonistic kingdoms in the Usumacinta River valley. Focusing on visual form, rather than content, of the inscriptions produced in both kingdoms provides insight into the cultural construction of intra- and inter-polity relations. In doing so, this research makes a broader case for studying hieroglyphic texts as material outcomes of cultural production and transmission that can shed light on the contexts of their creation.

**Mauck, Jessica (San Manuel Band of Mission Indians), Alexandra McCleary (San Manuel Band of Mission Indians) and Ryan Nordness (San Manuel Band of Mission Indians)**

[49]

*Decolonization and Co-stewardship: Protecting Cultural Landscapes across Serrano Ancestral Territory*

Since time immemorial, the Serrano people have maintained a close relationship with their ancestral lands, and have been tasked by the Creator to steward these lands in meaningful ways. As such, the Cultural Resources Management Department for the San Manuel Band of Mission Indians (SMBMI) has created a cultural landscape preservation program that focuses on co-stewardship with land owners, government agencies, and archaeologists via a decolonized consultation process. Specifically, our department does the following: (1) maintain a document library and GIS database complete with various types of cultural data (e.g., archaeological information, oral histories, ethnographic studies, etc.); (2) relay holistic cultural sensitivity assessments of a project area directly to the government agency early in the planning stages; (3) provide guidance to archaeologists regarding thoughtful, culturally appropriate archaeological identification efforts and noncollection site testing/evaluation methods; and 4) educate partners regarding the outdated modality and cultural inappropriateness of material data collection/long-term curation and offer clever solutions for avoidance and/or curation in place. By utilizing a decolonized process and adopting a co-stewardship ethos, SMBMI has found success in their efforts to preserve important Serrano landscapes in way that is reflective of the tribe's mission, vision, and values.

**Maxwell, Judith (Tulane)**

[59]

*Home Is Where the Rajawala' Are: Making Habitable Space among the Kaqchikel and Other Maya*

Mayan communities are located within sacred space. Each town has four principal guardians roughly aligned with cardinal directions and, in precontact times, a central altar. Each of the guardians is associated with a landmark (an escarpment, a cave/overhang, a spring or stream, a mountain) and embodies the energy of one of the 260-days of the ritual calendar, *cholq'ij*. Ceremonies performed at these guardian altars ensure the well-being of the community and offer protection during times of conflict. When refugees from the 35-year genocidal war were repatriated to the Ixcán region of Guatemala, the first task of the *ajq'ija'* "ritual specialists" accompanying these displaced returnees was to identify the locations of the potential guardian energies and establish altars, thus defining the new townsites as Mayan living spaces. On a smaller scale, each new dwelling is imbued with energy during its construction. This energy must be identified and named in a series of ceremonies. It then becomes the household *lar*, or guardian spirit. Energy is immanent within the natural and built world, but it takes Mayan ritual action to define the space as a living place, a place that is alive and one that is suitable for living within.

**May, Alejandra (Purdue University), Melissa Torquato (Purdue University), Trevor Keevil (Purdue University), Lauren Christopher (Purdue University) and Erik Otárola-Castillo (Purdue University)**  
[173]

*The Effect of Climate Change and Human Predation on the Niche Space of North American Proboscideans*

Approximately 13,000 years ago, 37 genera of North American megafauna went extinct. Proboscideans, mammoths, and mastodons, specifically, were among the megafauna affected. Today, researchers continue to debate between three hypotheses to explain these North American Pleistocene mass extinctions: (1) human over-hunting, (2) climate change leading to a reduced niche, or (3) a combination of both. Our previous research suggests that the effects of the warming, drying, and more seasonal climate at the end of the Pleistocene likely caused a competitive environment between mammoth and mastodon seen in a drastic shift in both species' niche space. While ecological theory predicts that competition can drive species to extinction, our original sample was not complete. We expand our previous work by increasing our database, including new site location data and radiocarbon dates, and completing reconstructions of key paleoenvironmental variables. Our objective is to model the effects of climate change and human hunting on the niche space of North American proboscideans within Bayesian hierarchical and Structural Equation causal inference frameworks. This study will enhance our understanding of the changing environments in which this megafauna lived and may have implications for studying modern extinction events.

May, Alejandra [40] see Radican, Kelsey

May, Andrew [143] see Perez, Gary

**May, Keith (Historic England, University of South Wales)**  
[97]

*Space-Time in the Matrix and the Uses of Allen Temporal Operators for Stratigraphic Analysis*

Records of archaeological stratigraphic data and the relationships between separately identified stratigraphic units are fundamental to understanding the overall cohesiveness of an archaeological excavation during fieldwork, analysis, publication, and in any resulting archive. Having divided the archaeology into various units for recording purposes, we use stratigraphy and associated temporal logical relationships recorded between the physical materials as the "reasoning glue" to connect all these different spatial and temporal phenomena, in the form of Stratigraphic Units, Phases, and Periods, back together again with various narratives to explain our conclusions. For "single-context recording" widely used in the UK and beyond, most archaeological temporal reasoning is based on the principles of stratigraphic superposition, the "Above and Below relationship." But further principles of temporal reasoning are also available. The CIDOC CRM uses the Allen operators to describe not just superposition but a set of more complex temporal logical relationships that can pertain between archaeological data. This paper will give an insight into how conceptual reference modeling can be used to explore these issues and how associated semantic technologies can enable semantically enriched deductions about the spatiotemporal and purely temporal relationships which fundamentally link such archaeological data together.

[97]

*Chair*

May, Keith [97] see Moody, Bryony

May Ciau, Rossana [71] see Gallareta Negron, Tomas

**May Ku, Luis Manuel**

[90]

*Rediscovering Ancient Maya Blue Pigments / Redescubriendo los antiguos pigmentos maya*  
[WITHDRAWN]

**Mayfield, Tracie (University of Southern California)**

[186]

*Archaeology and Ethnography on Old Providence and Santa Catalina Islands (Colombia)*

English settlers colonized Old Providence and Santa Catalina islands in 1629—arriving on the Seaflower, sister ship to the Mayflower—one year after the founding of the Massachusetts Bay Colony in what was to become the United States, but the two colonies had very different historical trajectories. From 1629 to 1630, colonists, under the direction of the Providence Island Company, constructed a town, New Westminster, and several forts. Around 1836, it became clear that the islands would not have enough agricultural productivity to sustain the population. Before the Spanish captured the colony in 1641, the islands were home to nobles, indentured servants, and tenant farmers from Europe, African and Afro-Caribbean slaves, Miskito Indians, Pequot Indians, and English and Dutch pirates, including William Henry Morgan. Many of the original inhabitants and early settlers stayed on after the colony changed hands and their descendants continue to live on the islands to this day. This presentation will provide a review preliminary data, initial research outcomes, and lessons learned from the inaugural field research season, which centered on archaeological and ethnographic data collection with the goal of investigating material, temporal, historiographical, cultural, and spatial dialectics on these small, yet highly multicultural, western Caribbean islands.

**Mazzetto, Elena (Universidad Nacional Autónoma de México)**

[155]

*Women Who Create and Feed the Gods: Female Priestly Work in Mesoamerica and the Andean Area*

This paper aims to study the role played by female characters presented in the Mexica and Inca religious hierarchy in a comparative perspective. In first case, we mention the *cihuamocexiuhzauhque*, the “women who fast for a year,” (Mazzetto 2017, 2020) while in the second we refer to the *acillacuna*. The activities carried out by these ritual specialists attracted the attention of the Spaniards who compared them respectively with the Catholic nuns or with the Roman Vestals (Alberti Manzanares 1986, 1987). In this speech we will focus on their function of creating and feeding divine beings. In the first part of the work we will analyze the relationship of these women with specific foods consumed in ritual and festive sphere: the *tzoalli* (amaranth and honey dough) and the *zancu* (corn mixed with blood). In the second part we will demonstrate how these women played an essential role in some Mexica god's life cycle and deified Inca mummies. Comparison between these two religious categories must be cautious, however, it will provide us with a significant methodology tool to understand how humans participated in the construction, commissioning, and prosperity of extra-human beings (Olivier 2015, 2020).

Mazzoni, Augusto [167] see Hunter Burkett, Meisha

McAvoy, Scott [29] see Liss, Brady

**McBeth, Connor (University of Calgary)**

[27]

*GIS Mapping of a Métis Cabin*

This poster examines ways of living of Métis Hivernants through a GIS analysis of a Métis wintering cabin completed as a part of the EMITA Project (Exploring Métis Identity Through Archaeology) directed by Kisha Supernant. Located in Southwestern Saskatchewan, Canada, the cabin was likely occupied sometime during the 1880s by an overwintering Métis family. This cabin was used as a home and base for bison hunting and beading through the winter months, both of which are vital to the Métis way of life. The GIS analysis consists of data taken during excavations from 2017–2019. It includes fauna, small beads, stones from the cabin chimney, glass, and other domestic artifacts. Point data of each artifact located in the field were used to identify patterns in artifact distribution that were not clearly visible while excavating. The maps were utilized along with remote sensing techniques such as ground penetrating radar and magnetometry to confirm the location of the cabin wall. This research provides unique insight into Métis ways of life and the Canadian Frontier of the late twentieth-century as the first GIS mapping of a Métis cabin and promotes further research into Métis modes of living and spatial interpretation of activities within homesteads.

**McBrinn, Maxine (Office of Archaeological Studies and the Museum of Indian Arts and Culture, NM), Julia Clifton (Museum of Indian Arts and Culture, Santa Fe), Diana Sherman (Museum of Indian Arts and Culture, Santa Fe) and Amy Montoya (Museum of Indian Arts and Culture, Santa Fe)**

[183]

*Donations and Transfers: Recent Challenges at One State Repository*

The care and preservation of cultural materials is viewed by the public as a vital role of the museum. Consciously or not, museums are seen as “society's attic,” a high-quality, sophisticated storage space that contains valuable and irreplaceable objects while remaining infinitely expandable. In reality, space is always tight while funds to properly care for the collections are frequently lacking. The mission of the Museum of Indian Arts and Culture is, in part, to safeguard the archaeological heritage of the state of New Mexico through caring for collections made over the past 100 years. This repository, like all archaeological curation facilities, also owes allegiance to the wider field of archaeology and its ethics. Our collections provide snapshots of stages in the evolution of the science during the twentieth and twenty-first centuries. Donations from private individuals and transfers from other institutions are surprisingly frequent occurrences. The MIAC staff uses a set of criteria to determine which collections to accept and which to decline. These criteria derive from museum-specific considerations as well as from the broader field. This paper presents our criteria and how they were applied to the decisions on whether to accept a variety of recent donations and transfers.

**McCafferty, Geoffrey (University of Calgary)**

[102]

*Reinventing the Early Postclassic of Cholula: Results from the UA-1 Household Compounds*

The culture history of Cholula (Puebla, Mexico) has been a roller coaster as different scholars with different paradigms have radically altered direction over the past 100 years. Consequently, when I got onboard the consensus was that Cholula had been abandoned at the end of the Classic period, in the same way as Teotihuacan, only to be reoccupied in the Late Postclassic. A field school excavation from the campus of the University of the Americas, designated UA-1, resulted in contextual data to challenge that cultural sequence. Prompted by my professor, Mickey Lind, I undertook the analysis of two household compounds that offered abundant archaeological materials dating to the Early and Middle Postclassic periods, ca. 900 to 1400 CE. This paper will outline the UA-1 households with emphasis on the ceramic assemblages. Among the conclusions are considerations of ethnic identities as well as the violent end of the Early Postclassic occupation. Interestingly, polychrome serving wares changed between the Early and Middle Postclassic, yet utilitarian wares remained the same, suggesting possible distinctions between public and private consumption practices.

**McCafferty, Geoffrey (University of Calgary)**

[132]

*Chair*

McCafferty, Geoffrey [132] see McCafferty, Sharisse

**McCafferty, Sharisse (University of Calgary)****[102]***Discussant***McCafferty, Sharisse (University of Calgary) and Geoffrey McCafferty (University of Calgary)****[132]***The Mexican Pantheon in Postclassic Pacific Nicaragua*

Colonial sources describe interaction between central Mexican groups and Central American cultures, including possible migration and colonization, during the Postclassic period (900–1520 CE). Linguistic and art historical evidence has been used to support and reify this connection. A 20-plus year archaeological program by the University of Calgary, however, has found limited evidence for large-scale migration into Pacific Nicaragua, thus challenging population replacement models that have dominated the literature. A more nuanced reading of the material culture, particularly iconography on polychrome pottery, allows interpretation of Mexican religious ideology beginning in the Early Postclassic period. Whereas feathered serpents have long been recognized in Greater Nicoya artistic renderings, detailed analyses of ceramics now offer evidence of other members of the central Mexican pantheon, including Ehecatl, Yiacatecuhtli, Mixcoatl, Cihuacoatl, and Tlaloc. Interestingly, some of these representations predate their appearance in central Mexico itself, complicating previous interpretations of Postclassic culture contact. Furthermore, these innovative elements offer insights into developing belief systems as Mexican deities became integrated with native animism.

McCafferty, Sharisse [132] see Hoopes, John

**McCarthy, Katherine****[101]***The Multiplicity of Murals: Translating Landscapes at Teotihuacan*

The murals at Teotihuacan have become a common source of fascination in the archaeology and scholarly considerations of the site. Although the site itself may need no introduction, the murals that decorate its walls have been studied with a level of uncertainty. Often depicting complex and abstract representations of landscapes and deities, these polychrome works created a style that spread from Teotihuacan and was later collected by major museums around the world. The murals become particularly interesting when seen not purely from a decorative or didactic point of view, but rather as activating devices and 3D spaces functioning in 2D depictions. The mural schemes at Teotihuacan serve a cartographic function as well, created as a way for the Teotihuacanos to visually map, understand, and metaphorically access the spaces they inhabited and the realms beyond their reach. In this paper, I will explore the messages mediated by the decorated surfaces of Teotihuacan, and present an alternative view of their function and capacity for transformation in the Classic period site.

**[101]***Chair*

McClain, Brittany [96] see Lassen, Robert

McCleary, Alexandra [49] see Mauck, Jessica

McConnell, Joseph [143] see Stokes, Robert

**McCool, Weston (University of California, Santa Barbara)****[175]***Examining the Trade-Off between Food Acquisition and Violence Avoidance: Population-Level Effects and Variability in Risk-Preference*

Resource procurement and the avoidance of interpersonal violence are critical features of human survival strategies. Yet these features are often competing, requiring individuals to make trade-offs in order to maximize fitness. Recent decades of research have shown violence to be a pervasive, albeit variable, feature of the human career. Frequently high levels of violence raise the inevitable question as to what behavioral adaptations have evolved to reduce violence risk (VR), and at what cost? In the following presentation we outline a risk-sensitive patch-choice model that formulates expectations for the optimal patch choice. The model predicts that a patch will be avoided when the risk-effect reduces energetic returns below that of than an alternative patch, or that a patch will be utilized at a lower efficiency when the risk-effect does not reduce energetic returns below alternative patches. Further, a risk-averse individual accepts reduced energetic efficiency in order to minimize VR, while a risk-prone individual continues to maximize energetics by accepting a higher VR. We test these predictions using human skeletal and stable isotope data and from a prehispanic population of agropastoralists from highland Peru.

**[175]***Chair*

McCormack, Steve [26] see MacMillan, Vincent

**McCormick, David (Yale University), Gilberto Cruz (Cotzumalguapa Archaeological Project), Erika Gómez (Cotzumalguapa Archaeological Project) and Oswaldo Chinchilla (Yale University)**

**[181]**

*Artisanal Diversification or "Multi-crafting" as Economic Strategy among Upper-Class Extra-household Groups at Cotzumalhuapa*

Various contexts in the sector of El Baúl, at the site of Cotzumalhuapa have been the subject of recent excavations to better understand the lithic industries of this urban center. These sectors were chosen for excavation due to the large surface scatters of lithic material indicating areas of obsidian tool production. At the epicenter of each surface scatter is a dump, indicated by the density and thickness of obsidian found at considerable depth. However, field observation and laboratory analysis has demonstrated that these dumps were not exclusively for obsidian. Certain materials incorporated in these dumps indicate a domestic nature and that the groups utilizing these dumps practiced "multi-crafting" as an economic strategy during the Late and Terminal Classic period (AD 650–950). The architectural context and ceramic materials recovered in these excavations suggests that these dumps pertained to groups of upper-class artisans.

**McCoy, Mark (Southern Methodist University), Jesse Casana (Dartmouth College) and Thegn Ladefoged (University of Auckland)**

**[131]**

*Field Systems, Urbanism, and State Formation in the Hawaiian Islands*

The significance of urbanization and royal centers in the development of productive agricultural systems and state formation has been minimized in the Hawaiian Islands. Today, thanks to several key methodological advances, especially remote sensing using lidar, we are closer than ever to an integrated and fine-grained model of economic, political, and religious developments that speak to historical processes that occurred independently many times in world prehistory. We begin by presenting the results from research on the island of Hawai'i where aircraft-mounted lidar has been used to map upland fields at level similar to pedestrian survey over an area of 240 km<sup>2</sup>. Next, we discuss new maps of coastal settlement, including examples of royal centers, created using the first use of UAV-mounted lidar for large scale archaeological survey. Finally, we connect the upland agricultural zone and the coastal habitation zone through a chronology of ritual and monument construction that shows a previously undocumented shift in religious practice that appears to mark the transition to an archaic state society.

**McCray, Brian (Vanderbilt University)**

**[157]**

*Vassals or Friendly Confederates: Disjuncture and Identity Imposition in the Late Horizon Northeastern Andean Montaña*

Borderlands, like the eastern Andean slopes between highland states and lowland complex chiefdoms, are frequently a destination for peoples fleeing from state control and characterized by complex multiethnic landscapes. Archaeological studies in northeastern Peru, however, often assume a mega-ethnic group, the Chachapoya, held sway over the area during the Late Intermediate period (LIP; AD 1000–1450). This characterization led to a straightforward model for Late Horizon (LH; AD 1450–1532) Inka administration of the region: local people accepted Inka rule in place of Chachapoya hegemony. This paper addresses the experience of Inka presence at a small village at 1,500 masl in the lower montaña. Through analysis of ceramics and feasting remains, I demonstrate that the lower montaña did not have strong ties to a Chachapoya identity in the LIP, and only began to use some classic Chachapoya ceramics in the LH, in conjunction with provincial Inka wares. This suggests that the Inka attempted to extend Chachapoya identity downslope, where they had few means to prevent local people moving outside their control. In the face of this Inka imposition, the lower montaña residents maintained multiple network disjunctures—alternative sets of symbolic, political, and religious practices expressed in communal gatherings.

**McDaid, Chris (US Air Force, Fort Eustis, VA), Patrick Barry (Colorado State University) and Courtney Birkett (Colorado State University)**

**[35]**

*Monitoring, Planning, and Treating Archaeological Sites for Climate Change*

The Fort Eustis portion of Joint Base Langley-Eustis is a peninsula of 8,000 acres bounded by Skiffes Creek, the Warwick River, and the James River on Virginia's coastal plain. The installation has 233 identified archaeological sites. Thirty-one sites are subject to erosion by the surrounding waterways. Beginning in 2010, the installation instituted a site monitoring program to document the physical status of the sites. Data from that program revealed many sites were being impacted by erosion. The installation developed a system to quantify current and potential future erosion damage for the 31 sites being damaged, as well as a system to prioritize and triage the sites for future study and treatment. Since developing the system, the installation has recorded erosion data to verify the model, worked to identify sites warranting stabilization, and stabilized significant sites. Additional analysis of the types of sites being threatened indicate a disproportionate number of Woodland period sites (1200 BCE–1600 CE) being impacted by erosion than was expected, a finding that the installation is accounting for as it plans for future preservation activities in consultation with federally recognized Native American tribes with ties to the installation.

Mcdermott, Michael [152] see Cortes-Rincon, Marisol

**McDonough, Katelyn (Texas A&M University) and Jaime Kennedy (University of Oregon Museum of Natural and Cultural History)**

**[95]**

*Paleoethnobotany of the Connley Caves, Oregon: Investigating Pleistocene Plant Food Economies*

Questions concerning human paleoecology and subsistence strategies continue to shape Paleoindian research in the Great Basin. Despite significant advances in our understanding of human lifeways during the terminal Pleistocene, the relationship between

human populations and plant food communities is still unclear. Specifically, what was the role of plants in the food economy of early Great Basin foragers? How did changing climatic conditions affect plant communities and how did humans respond? Archaeobotanical data is required to address such questions, but preservation of perishable materials is rare. The Connley Caves in central Oregon provide a unique opportunity to address these long-standing issues. Recent excavations at this site uncovered multiple Younger Dryas age (ca. 12,900–11,600 cal BP) cultural components containing extensive Western Stemmed Tradition tool assemblages, multiple hearth features, and preserved organics. This paper presents results of the paleoethnobotanical analysis examining seasonality of site occupation and patterns of plant exploitation throughout the Younger Dryas.

[95]

Chair

**McElfresh Buford, Katie (Missouri State University) and Billie Follensbee (Missouri State University)**

[107]

*Finding the Right Niche: Altar, Throne, Stela, Sarcophagus? Overlap and Ambiguity in Olmec Large Stone Sculpture*

Among the most diagnostic sculptures made by the Gulf Coast Olmec is the tabletop altar/throne. This sculpture is best known for its most common features: a wide, heavy cornice; a generally rectangular structure; and often, a niche in the front. Given the tabletop form, scholars originally interpreted these sculptures as altars, but many are much too large to have served as a sacrificial platform. Apparently resolving this enigma was Grove's discovery of the Oxtotitlan Cave painting illustrating an elaborately garbed figure seated on a throne, as the supernatural imagery depicted on its heavy cornice is very similar to that on the Olmec sculptures. The recognition of additional Olmec and Olmec-related sites and further excavation have continued to add to the repertoire of Olmec sculptures—but have also introduced ambiguity and uncertainty into traditional sculpture categories. Some sculptures currently designated as thrones do not have niches but large, supernatural faces or multiple figures, while others may be lids to stone boxes, stelae, or another type of niche figure. A study of altar/throne and niche figure variations, of the overlap of forms and imagery, and a reevaluation of possible functions, all together provide new insights into our understanding of Olmec sculptures.

McGill, Dru [97] see Krus, Anthony

**McGuinness, Megan (University of Nevada, Reno)**

[7]

*Where to Inhabit First? Interpreting Western Stemmed Tradition Land-Use with the Ideal Free Distribution Model in Lake County, Oregon*

In the Intermountain West there is mounting evidence that some Western Stemmed Tradition (WST) points are as old, if not older, than Clovis points on the Plains and in the Southwest. Given this, the distribution of WST points may hold the key to understanding how people initially populated the Far West. I use WST point and site location data in Lake County, Oregon collected using the Oregon Archaeological Records Remote Access (OARRA) to test predictions of the ideal free distribution (IFD) model. The IFD model predicts that people will settle higher-ranked habitats first (in this case, large marshes) and lower-ranked later (smaller marshes or other habitats) in the face of rising populations and declining returns. Using existing paleoenvironmental records for four adjacent lake basins and working chronology for various stemmed point types, I test the hypothesis that people settled around productive wetlands during the Younger Dryas and later expanded into smaller basins or other zones during the early Holocene. This process may hold clues for broader discussions about how and when people spread throughout the Intermountain West and beyond.

**McIntosh, Brandon (Washington State University; Statistical Research Inc.) and Kristin Corl (University of Texas, San Antonio)**

[39]

*What Late Formative Period and Modern Jackrabbits (Lepus californicus) Tell Us about Climate Change in the Southeastern Southwest*

This poster documents the environmental conditions of the Tularosa Basin/Hueco Bolson during the Doña Ana and El Paso phases (AD 1000–1450) in the Jornada Mogollon Region of the US Southwest by comparing stable carbon isotope values of black-tailed jackrabbits (*Lepus californicus*) from archaeological sites to modern jackrabbits in southern New Mexico and west Texas. Research by Stephen Smith and his collaborators provides evidence that carbon isotope values of jackrabbit bone collagen produce an effective proxy for plant communities, and by extension environmental conditions, within which these herbivorous animals lived and foraged. Knowing this, it is possible not only to understand jackrabbit diet and environmental conditions in prehistory but also to compare environmental proxies with modern jackrabbit stable carbon values to document how the environment has changed in the last 500–1,000 years. A comparison between archaeological and modern jackrabbits provide a deeper temporal context for understanding climate change in the Tularosa Basin and Hueco Bolson than traditional historical methods. Additionally, a discussion of the utility of stable hydrogen isotope analysis for differentiating between jackrabbit diets biased toward either C<sub>4</sub> or CAM plants will be presented as a method to increase interpretive precision of dietary and environmental variability.

**McKee, Brian (University of Arizona), Fernando Zuleta (Independent researcher, El Salvador), Katherine Cera (EcoPlan Associates) and Christopher Taylor (Westland Resources)**

[11]

*Cerro Coroban: A Contact Period Lenca Site in Eastern El Salvador*

The Coroban site, located on a highly defensible summit in Morazán, El Salvador, was occupied by the Poton Lenca. The Lenca inhabited most of eastern El Salvador and western and central Honduras during the early sixteenth century Spanish Conquest. They spoke two or more languages with multiple dialects and belonged to distinct, albeit related, cultures. The Lenca of eastern El Salvador are referred to as Poton. Local oral traditions recorded in the early twentieth century named Coroban as ancestral to

Gotera, the modern capital of Morazán department. The inhabitants of Coroban participated in the great pan-Lenca insurrection of 1537 against the Spanish. Although archaeologists have known of Coroban since the 1920s no formal description or map had been published prior to 2015, when the primary and secondary authors visited the site, documenting its surface expression. We examine the archival, oral historical, and archaeological evidence of Coroban, its participation in the 1537 insurrection, and its identification as ancestral to Gotera. We also propose a plan for future investigations to better understand the site. The plan includes archival investigations, fieldwork, artifact analysis, and the study of nearby sites.

**McKee, Brian (University of Arizona)**

[188]

*Discussant*

**McKenzie, Emily (University of Alabama)**

[3]

*For "Wood" Measure: Exploring the Applicability of Elemental Analysis in the Study of Charred Wood*

Over the past few decades, archaeologists have embraced the compositional and elemental analysis of archaeological materials—primarily ceramic, metallic, and lithic objects—drawing new conclusions about the circumstances surrounding their production, such as the geographic origins of their raw components or the processes by which they were made. To explore the applicability of these techniques for the study of charred plant remains, namely charred wood, I conducted a pilot study using elemental, analytical techniques like x-ray fluorescence (XRF) and laser-induced breakdown spectroscopy (LIBS) on both modern and archaeological charred wood specimens to determine the extent to which charred wood retains a unique chemical signature. The results of this research have the potential to inform archaeologists about the degree to which the chemical composition of charred wood can yield information regarding its identification and formation process.

McKenzie, Emily [5] see Hatcher, Lawford

McKeown, Ashley [32] see Ahlman, Todd

McKeown, Ashley [32] see Bowden, Taylor

McKeown, Ashley [32] see Friend, Sadie

McKeown, Ashley [32] see Green, Olivia

McKeown, Ashley [32] see Karastamatis, Kallista

McKeown, Ashley [32] see Stainton, Adrienne

McKinnon, Jennifer [85] see Bush, Dominic

**McLeester, Madeleine (Dartmouth College) and Jesse Casana (Dartmouth College)**

[131]

*Locating Wisconsin's Past Indigenous Agricultural Landscapes Using Historical Aerial Photography*

Wisconsin has the largest number of recorded precolumbian and early historic Indigenous ridged and hilled garden beds in the American Midwest, with over 450 known examples. But, twentieth-century land-use practices have destroyed or obscured more than 90% of these sites. Leveraging a comprehensive database of high-resolution aerial photographs dating to the 1930s, alongside both modern aerial imagery and public lidar data, we systematically analyze sites in the Wisconsin River drainage basin where Indigenous agricultural features were previously recorded in order to determine whether such features could be resolved in historical imagery. Here, we present both our successes and challenges in detecting and interpreting archaeological field systems, effigy mounds, and other features in 1930s aerial photographs. Results offer new perspectives on Wisconsin's archaeological agricultural landscapes and highlight the potential of historical aerial photography to reinterpret known sites as well as discover previously unrecorded sites and features in regions that have been heavily impacted by modern development.

[131]

*Chair*

McLeester, Madeleine [131] see Casana, Jesse

McLeester, Madeleine [131] see Schurr, Mark

**McMahon, Todd (History Colorado, Office of the State Archaeologist)**

[192]

*Developing a Resilient Colorado Curation Model: The Innovative Solution to Addressing the State's Collections Care Needs*

Colorado was for many years the center of a curation crisis. In response, Colorado relied on the establishment of somewhat informal partnership institutions such as (Universities, small local museums and local regional repositories) that have now been strengthened by creating rules and procedures that have allowed turnkey, scalable, politically neutral, regional solutions to the State's archaeology and natural history specimen's care needs. The State of Texas Curatorial Facility Certification program served as the legal framework model that was modified and applied to Colorado. Instead of a separate certification program, however Colorado relies on national and regional museum "accreditation" and assessment programs to build resiliency within the curation network. The network also hopes to expand the ability for repositories to obtain trained volunteer assistance as well as museum studies students and offer opportunities to museums to obtain grants for re-housing or interpretation. The end goal then is a program that is beneficial to all parties, as it strengthens local museum's collections care, their access/use and helps to promote a greater appreciation for existing collections.

**McPherron, Shannon (MPI)****[58]***Fracture Mechanics, Virtual Knapper, and Controlled Experiments: Toward a Better Model of Flake Formation*

Insights into flake formation have come from fracture mechanics, controlled experiments, replication studies, and attribute analysis of lithic assemblages. Fracture mechanics would seem to offer great potential for offering insights into how the variables that knappers manipulate actually change flaking outcomes, and its strength is that it is based on physical principles. However, for various reasons, fracture mechanics has had very little impact on lithic studies. Rather, most insights come from replication studies where variables that knappers think influence outcomes are tested and combined with attribute analysis. Even the controlled experiments of Dibble's group tested variables that prehistorians focused on rather than looking to fracture mechanics for models of flake formation. As a result, as Speth noted half a century ago, how or even whether the attributes we typically measure on stone tools are meaningful for explaining flake variation is typically not justified a priori by theoretical models of flake formation. A new effort to bring fracture mechanics into studies of flake formation is coming from an effort to build a virtual knapper. This program requires a generalized model of flake formation and has resulted in a new series of controlled experiments grounded more closely in fracture mechanics.

**McRostie, Virginia (Pontificia Universidad Católica de Chile)****[114]***Chair*

McRostie, Virginia [114] see Ugalde, Paula

**McSherry, Christina (University of Nevada, Reno)****[184]***Identity, Place, and Public Memory: A Linguistic Analysis of American Civil War Monuments at the Gettysburg Battlefield*

The location of the American Civil War Battle of Gettysburg, now preserved at the Gettysburg National Military Park (GNMP), receives thousands of visitors every year. Visitors to the battlefield interact with over 1,000 monuments across the landscape that both commemorate the actions that took place and memorialize the participants in those actions. Presented here are the preliminary results of a linguistic study of the monument inscriptions. Including both Union and Confederate monuments erected by the National Park Service as well as other organizations, this study uses linguistics to investigate the monuments' connection to place, how identity is expressed and the use of intertextuality to understand how the events of the battle are commemorated. In addition, this paper addresses battlefield tourism and the impact of the monuments on modern visitors, including the meaning they convey to the public.

Mdludlu, Ayanda [151] see Collins, Benjamin

Meadow, Richard [100] see Borreggine, Marisa

**Means, Bernard (Virtual Curation Laboratory)****[74]***Discussant***Means, Bernard (Virtual Curation Laboratory)****[153]***"They left about the time I could begin to depend upon them": Helen Sloan Daniels and the National Youth Administration Durango Public Library Museum Project*

One of the lesser known programs that funded archaeological excavations during the Great Depression was the National Youth Administration (NYA). NYA archaeology has been overshadowed by projects funded by its more prominent "cousin," the Civilian Conservation Corps (CCC), and its older "sibling" the Works Progress Administration (WPA). Helen Sloan Daniels, who lived all but four years of her life in Durango, Colorado, made both minor and major contributions to the archaeology and ethnology of the area around her hometown. Here, I focus on her work from 1936 to 1940 with the Durango Public Library Museum Project, which employed shifting—and small—numbers of young men and women provided by the NYA. Daniels actively worked with professionals on her project, consulting with them as she could. She and her technical advisor, I. F. Flora, made a particular effort to recover material suitable for the then relatively new technique of dendrochronology. Samples recovered by the NYA workers extended the local tree-ring chronology back to AD 253.

Medchill, Brian [87] see Morgan, Linda

Medhat, AbdelRahman [96] see Silverstein, Jay

Meierhoff, James [38] see Monaghan, John



**Mejía Ramón, Andrés (Pennsylvania State University), Nadia Johnson (Rhea Engineers and Consultants Inc.) and Christian John (University of California, Davis)**  
**[101]**

*Reading Power from Above: Subsistence, Monumentality, and Water Ritual in Ancient Teotihuacan*

Proponents of collective and autocratic models of Teotihuacan's sociopolitical organization relate the control and ritual of water to the development of complex society, but how such institutions materialize on the landscape remains poorly understood. We present evidence from six years of archaeological survey, excavation, remote sensing, and a reinterpretation of mural art, suggesting that large amounts of energy and social capital were invested in the construction and maintenance of systems to capture broadly distributed rainwaters. Wide, shallow canals—dammed at semi-regular intervals—served to retain highly erosive runoff while making waters available for diversion irrigation and other purposes. Evidence of such systems exists in the contemporary archaeological record among the barrancas of the Southern Teotihuacan Valley. These tiered reservoir systems were of sufficient importance to the builders of the ancient city that they were monumentalized and memorialized in the construction of the Street of the Dead, which served as the destination of a significant portion of the valley's rerouted floodwater networks. This spatial and hydraulic axis mundi was incorporated into the ideology and state ritual of Teotihuacan in radically different ways by different rulers, suggesting dramatic constrictions in political accessibility as the city expanded, despite political origins rooted in broad-based public legitimacy.

**Melendez, Juan (Musée du quai Branly - Jacques Chirac) and Emiliano Melgar (Museo del Templo Mayor)**

**[136]**

*Exploring the Economic Sphere of Prestige Items through the Lens of Ancient Maya Greenstone Mosaic Masks (300–750 CE)*

With the aim of exploring the economic system surrounding prestige Maya items during precolumbian times, we present research focused on greenstone mosaic masks (GMM) found in funerary precincts of high elite individuals in the Guatemalan Maya Lowlands. Through microarchaeological analyses of a select number of tesserae ( $n = 249$ ) that form sections of 13 GMM, which comprise around 27% of the GMM reported to date in the Maya area ( $n = \sim 49$ ), we identified that these were manufactured using standardized processes as reflected by the utilization of similar raw material of the tools. The scarce evidence compiled to date regarding the location of potential precincts where greenstone tesserae could have been manufactured point to a possible centralized production area. Some tesserae show evidence of having been repaired and reused from previous jewels. We thus believe these tesserae were extracted from treasures (i.e., heirlooms) instead of commodities. Considering that 67% of the GMM ( $n = 33$ ) were found in four sites of the Maya Lowlands, it seems their use and perhaps their distribution were exclusive. The latter suggests that GMM could have been insignias of affiliation linked to a powerful regime during the Late Classic period (550–800 CE) if not before.

Melendez, Juan [51] see Aquino, Daniel

**Melgar, Emiliano (Museo del Templo Mayor-INAH) and Reyna Solís (Museo del Templo Mayor-INAH)**

**[50]**

*Archaeometry of the Lapidary of Xalla and the Identification of Teotihuacan Relics in Tenochtitlan*

The new archaeometrical characterization of the lapidary objects from Xalla allowed us to distinguish local and foreign goods among this palace compound inside the multiethnic settlement of Teotihuacan. In this paper, we will present different nondestructive techniques (UVF, IRR, OM, SEM-EDS, and  $\mu$ Raman) employed on this lapidary assemblage to identify their chemical composition, mineralogy and provenance, and the characterization of their manufacturing traces. Using these methods, we detected raw materials from diverse geological origins, like jadeite, green quartz, serpentine, travertine, and amazonite, among others. With the traceological analysis, we distinguish four technological patterns. The comparison of them with the lapidary traditions developed in Classic Mesoamerica allowed us to identify them as Teotihuacan, Maya, and Zapotec. Also, we note specific relationships and cultural preferences between some types of raw materials, objects, and techniques. Finally, the temporal and spatial comparison of these lapidary items with other sites, like the Great Temple of Tenochtitlan, confirmed the existence of lapidary relics with the Teotihuacan technological style in Postclassic sites.

Melgar, Emiliano [136] see Melendez, Juan

Mellet, Claire [98] see Tizzard, Louise

**Mendoza, Rubén (CSU Monterey Bay)**

**[154]**

*Discussant*

Mennenga, Moritz [98] see Segschneider, Martin

Ménot, Guillemette [78] see Cromartie, Amy

**Merkle, Ann (Washington University in St. Louis)**

**[44]**

*Sacred Colors and Nomadic Design: The Hand-Formed Slip-Painted Pottery of the Medieval (Eighth–Twelfth Century CE) Central Asian Highlands*

This paper addresses how social identity, as reflected in networks represented through pottery decoration, served as a means of mediating and buffering against the social uncertainties generated by shifting political and religious landscapes of medieval Central Asia. My project examines the decoration and distribution of hand-formed slip-painted pottery (HSP) to understand how these objects may reflect social identity construction or continuity across different social and geographic environments. I use the medieval site of Tashbulak (TBK), located in the highlands of southeastern Uzbekistan, as a case study, due to the unusually high concentration of HSP found at the site. The unusual distribution of HSP at Tashbulak suggests that the occupants were recent migrants into the region, moving with the spread of the Qarakhanids, or that they were an indigenous community who found themselves adapting to the increased spread of Turkic tribespeople from the northeast. I measure decorative and formal diversity of HSP and its prevalence through an analysis of decorative variables recorded from pottery excavated at TBK. By comparing these types of diversity, I will test how this variation informs us about life at TBK, and about regional variation of social identities across highland Central Asia in the medieval period.

[44]

Chair

Mermejo, Richard [145] see Montgomery, Lindsay

Merod, Zoe [153] see Mills, Rebekah

**Mersmann, Joy and John Stauffer (Washington University in St. Louis)**

[51]

*Center Posts, Thunder Symbolism, and Community Organization at Cahokia Mounds, Illinois*

North American and Mesoamerican material cultures exhibit similarities that were mistakenly seen by early diffusionists as evidence for northward migrations that catalyzed social complexity among Mississippian period (AD 1050–1500) cultures. Iconographically, assemblages from both geographic areas highlight thunder deities wielding celiform objects as symbols of politico-religious offices, but Mississippian examples frequently include “striped pole” motifs that resemble historic and archaeological features in the middle of community spaces. These iconographic subjects reveal that arrangements of central pole features in relation to the mounds and plazas of North American sites require greater attention. In this study, we examine the arrangement of Emergent Mississippian (AD 850–1050) and Mississippian period central pole features at the Cahokia site over time to identify shifts in community spaces and interpret the distribution of authority among their inhabitants, using viewsheds modeled in a geographic information system. We hypothesize a shift occurring ca. AD 1150, and run a viewshed analysis on both a modern DEM and on a re-creation of a pre-1150 DEM. Using this data, we address the changing structure of politico-religious authority at Cahokia as mediated through highly visible center poles.

Mertan, Tamer [31] see Ugras, Funda

**Mesia-Montenegro, Christian (Universidad Privada San Juan Bautista)**

[166]

*Secularism and Religiousness in Late Formative Ceramics from Chavín de Huántar*

The pottery from the ceremonial center of Chavín de Huántar has been the reason for considerable attention by numerous researchers who have highlighted various qualities related to its manufacturing and iconography. Special attention has been put in ceramics qualified as ceremonial, from closed contexts (Ofrendas Gallery) inside the ceremonial center and from pottery with icons related to supernatural beings (sensu Rowe 1962). At the same time, in the last decades has been identified a ceramic ensemble recently recognized as janabarroide, which within its various attributes presents a series of patterned designs whose Basic units have “S”, “U” and “O” shapes. This type of pottery appears in Chavín de Huántar in contexts outside the monumental nucleus (Campo Oeste, Wacheqsa, la Banda, etc), while ceremonial ceramics with abundant anthropomorphic designs are found overwhelmingly in the nuclear area of the Ceremonial Center. In that sense the this paper argues the existence of an intrinsic and controlled segregation context of the use of ceramics according to the meanings and / or nature of the purposes for which they were produced, sometimes allowing the occasional coexistence of both sets.

Messager, Erwan [78] see Cromartie, Amy

Metcalfe, Megan [98] see Evans, Amanda

Meyer, Jana Valesca [27] see Marquardt, William

**Meyers, Maureen (University of Mississippi) and Amber VanDerwarker (University of California, Santa Barbara)**

[81]

*Regional Contexts of Sexual Harassment in the United States: A Comparison of the SEAC and SCA Surveys*

Sexual harassment has long been rampant in the discipline of archaeology, and until recently, our collective understanding of its pervasiveness and effects has been largely anecdotal. Recent surveys on the topic aimed at the memberships of the Southeastern Archaeological Conference (Meyers et al. 2018) and the Society for California Archaeology (Radde 2018; VanDerwarker et al. 2018)

are beginning to provide the data necessary to understand the rates and contexts of harassment in American settings. Interestingly, while both surveys report high rates of harassment, the rate reported by SEAC members is nearly 20% greater than that reported in the SCA survey (68% vs. 50%). This large discrepancy, along with significant demographic differences between the two samples, reveals the need for a geographically broader survey implemented by the SAA to account for differential factors leading to this divergence. Our presentation explores this discrepancy with the goal of discovering which variable(s) associate with the lower vs. higher harassment rates in these two broad regions—an exercise which may allow us to pinpoint specific changes that could be implemented in different contexts to reduce this seriously problematic behavior.

[81]

Chair

**Micheletti, George (University of Central Florida)**

[56]

Discussant

**Micheletti, George (University of Central Florida), Terry Powis (Kennesaw State University) and Norbert Stanchly (AS&G Archaeological Consulting)**

[152]

*Investigating the Contexts of An Early Classic Carved Monument at the Maya site of Pacbitun, Belize*

Since the discovery of Stela 6 in the mid-1980s, the weathered remains of this Early Classic period carved stone monument continue to lie in the main plaza at Pacbitun, displaced in antiquity. Reexposed in 2003, epigraphic analysis verified the monument's AD 485 Long Count date—confirming it as one of the earliest carved stelae in the Maya lowlands—and revealed important details concerning Pacbitun's political status and affairs at this time. Yet, owing to the challenges presented by the monument's poor condition and the difficulties of in-field analysis, carved details that may prove significant to the historic record still remain undeciphered or uninterpreted. Thus, in December of 2019, another investigation was initiated to recover, reconstruct, preserve, and digitally conserve Stela 6. Though progress has been stalled due to the cancelled 2020 field season, the interesting 2019 excavations warrant a discussion. This presentation will detail the discovery of the base of Stela 6, presumed to mark the monument's original setting, as well as the ritual deposits associated with the monument's primary and secondary contexts—both containing fragments of a rare andesite stela at that once stood near the Tzul Causeway to the south of Pacbitun's Plaza A.

Micheletti, George [119] see Powis, Terry

Micheletti, George [116] see Skaggs, Sheldon

Middleton, Ken [184] see Law, Zada

Mietes, Esther [83] see Napolitano, Matthew

**Mikeska, Christine (University of North Carolina, Chapel Hill)**

[129]

*Understanding Patterns of Indigenous White-tailed Deer (Odocoileus virginianus) Exploitation in the North Carolina Piedmont Using Strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) Isotope Analysis*

The varied responses by Native communities within the American Southeast to European colonization resulted in a period of dynamic social, economic, and political change. One such response to the colonial encounter was the development of a robust trade in the skins of white-tailed deer. In this paper, I focus on the effects of the deerskin trade on the deer exploitation practices of Native communities within the North Carolina Piedmont using strontium isotope ratios ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) from deer teeth to identify patterns of mobility and estimate hunting territories. Through the analysis of archaeofaunal assemblages from five Piedmont sites dating from AD 1450 to 1710 in the Eno and Dan River drainages, I identify multiple patterns of changes in Indigenous hunting behaviors. Situating these contrasting patterns of exploitation within the broader context of European colonization and the deerskin trade, these results highlight the dynamic and community-specific responses of Native communities to the disruptions and opportunities represented by the colonial encounter.

**Milbrath, Susan (Florida Museum of Natural History)**

[154]

*Take My Heart, Take My Head: Death among Gods in the Codex Borgia*

Ritual violence is well represented in the Codex Borgia, a masterpiece from early sixteenth-century Central Mexico. Narrative scenes depict Venus gods alongside deities honored during seasonal *veintena* festivals known from the Valley of Mexico and Tlaxcala. The Aztec Tlacaxipehualiztli festival featured sacrifice of Xipe Totec's impersonators during March. In the Codex Borgia, the god himself is represented as the victim stretched out on a round stone. Venus gods appear alongside, indicating the planet plays an important role. The 18-page narrative references specific *veintena* festivals to provide a chronological framework for events involving the changing Venus phases. Another page in the narrative represents Quecholli, a November festival honoring Camaxtli. Here, we see this hunting god on a *tzompantli*, evoking a decapitation ritual described in the Aztec festival of Quecholli, when severed heads were placed on Mixcoatl-Camaxtli's skull rack. The Codex Borgia shows Camaxtli merged with the skeletal "lord of dawn" at a time when Venus was transiting the underworld during Quecholli. Alongside, Quetzalcoatl extracts Tlahuizcalpantecuhtli's heart, meaning one Venus god kills the other, representing a transition in Venus phases. Then below we see Tlahuizcalpantecuhtli's decapitation, symbolizing the final underworld transformation of Venus, just prior to the Evening Star's reappearance.

Miles, Aimee [83] see Levin, Maureece

**Miller, Heidi (University of South Florida) and Christopher DeCorse (Syracuse University)**

[67]

*A Bioarchaeological Analysis of a Skeletal Population from Elmina, Ghana during the Period of the Transatlantic Trade: 1482–1873*

The Castelo de São Jorge da Mina, better known as Elmina, was established in 1482 in modern-day Ghana by the Portuguese as the first European trading post on the coast of West Africa. The fort was captured by the Dutch in 1637 and remained under Dutch control for the next 235 years. It was transferred to the British in 1872, but, when the local Elmina population refused to recognize the British authority, the town was leveled and never reoccupied. An estimated 100 individuals were recovered during the course of excavations, representing the largest skeletal assemblage ever recovered from West Africa. This interdisciplinary, biocultural research project focuses on the skeletal remains of approximately 100 individuals recovered from the site of Elmina in coastal Ghana. Data collected from the skeletal assemblage will be used to evaluate the demography, health, and morbidity of an indigenous African population that came into contact and established ties with Europeans. The proposed research will use standard bioarchaeological methods to estimate the age, sex, stature, and health of the individuals from Elmina. This presentation discusses the results of preliminary bioarchaeological analysis of the approximately 100 individuals represented in the collection.

**Miller, Hollis (University of Washington)**

[179]

*Putting the Past in Conversation with the Present: A Collaborative Archaeology of Colonialism in Old Harbor, Kodiak Island, Alaska*

Sugpiaq (also known as Alutiiq) people have a more than 7,500-year history on the Kodiak Archipelago and in the surrounding areas. Through that long history, they adapted and invented new technologies, grew from small and mobile communities to large, settled villages, fought and traded with their neighbors, and created a vibrant coastal society. Russian colonialism brought unprecedented challenges to Sugpiaq communities including systematic violence, epidemic disease, forced labor, resettlement, and religious conversion. Colonial entanglements with Russian fur trading companies and clergy impacted the daily lives of Sugpiaq peoples in countless ways. In my dissertation research, I combine evidence from the archaeological record, Sugpiaq oral history testimony, and archival documents to address how Sugpiaq people negotiated the challenges of colonialism in their daily lives—persisting physically, socially, spiritually, and culturally through the shocks of initial colonialism and, ultimately, to the present day. The research is undertaken as a collaborative project with the Sugpiaq community of Old Harbor, Alaska. This method braids together multiple lines of evidence to enhance our study of the past, while acknowledging and honoring the relationships between Sugpiaq communities past and present.

Miller, Jacquelyn [35] see Kelley, Alice

Miller, Jennifer [40] see Radican, Kelsey

**Miller, Kye (PaleoWest) and Jeremy Loven (PaleoWest)**

[187]

*Curiosity and Collaboration: Interaction with the Tribal Public in Northwestern New Mexico*

Between 2011 and 2019, PaleoWest Archaeology assisted the Bureau of Reclamation with the nation's largest federally funded archaeology project, the Navajo-Gallup Water Supply Project (NGWSP) in northwest New Mexico. A substantial portion of the project is on Navajo Nation tribal lands and the archaeological work conducted ahead of this water infrastructure project was of great interest to local Navajo people and other descendant and consulting tribes. This presentation summarizes our experience with the tribal public as part of NGWSP.

**Miller, Mason**

[187]

*The Hows, Whys, and Huhs of Archaeology at the Headwaters*

This presentation describes the holistic and forward-looking public outreach and engagement effort that was developed to correspond with “the Big Dig,” a Phase III archaeological mitigation excavation at the Headwaters at the Comal Nature Interpretive Center (41CM204) near New Braunfels, Comal County, Texas, United States (2018–Present). The Headwaters Outreach Team developed the program to specifically not speak to archaeologists. Its primary goal was demystifying our science for a geographically broad general public to improve archaeology's accessibility and educational versatility. For members of the local community, there were guided tours and archaeology-themed events on site. For attendees farther away, the team developed a weekly YouTube Livestream and supporting media on an excavation blog site as a relevant and easily accessible teaching resource for elementary and middle schools in the future. To date, 18 videos have been produced with nearly 280 collective hours of viewing time on YouTube. The Headwaters archaeology-themed programming has been broadly praised and continues to pay dividends in outreach, advocacy, and education not only for members of the local community but across the United States and beyond.

**Miller, Melanie (University of Otago, New Zealand), Yu Dong (Shandong University, Qingdao, China), Kate Pechenkina (Queens College, New York City), Wenquan Fan (Henan Provincial Institute of Cultural Relics and Archaeology) and Sian Halcrow (University of Otago, New Zealand)**

[29]

*Dietary Histories in Early China: Gender and Food in Urban and Rural Eastern Zhou Communities (771–221 BCE, Ancient*

*Zhenghan City, China)*

Stable isotope analysis of human skeletal samples allows bioarchaeologists to study human diet from discrete periods of life and can provide fine-grained dietary histories of individuals. Previous research on the Eastern Zhou Dynasty identified dietary differences between adult females and males, and a study of childhood diet for two urban Eastern Zhou communities indicated that gendered eating patterns began in early life. Those studies found that, over the lifetime, males consumed greater amounts of millet than females, who consumed more wheat, soy, and other C<sub>3</sub>-foods. However, it is unknown if these differences between the diets of females and males existed in other Eastern Zhou communities, or if this was a local phenomenon limited to the urban center of ancient Zhenghan city (modern-day Xinzheng, China). This project examines individuals from three newly studied mortuary populations including both urban and rural settings. Using a life-course approach, we sampled an early-forming tooth from 38 adult individuals using incremental dentin sampling to investigate breastfeeding, weaning, and childhood diet, in conjunction with a bone sample, which records diet from the final decade before death. Here we examine dietary patterns over individual lifetimes and compare urban and rural experiences in relation to gender and social inequality.

Miller, Melanie [156] see Hastorf, Christine

**Miller, Myles (Versar)**

[130]

*Examining Multiple Groups of Chronometric Data Using Multiple Methods: An Example from the Prehispanic US Southwest*  
Over 4,000 radiocarbon age estimates are used to examine temporal trends in the Jornada region of the American Southwest between 4500 and 400 BP. Chronometric analysis reveals changing frequencies in architectural forms, technologies, and subsistence, a series of punctuated demographic trajectories and regional abandonments, and the appearance of new ideologies and their associated iconographic expressions. Multiple temporal trends can be cross-examined using large sample sizes of age estimates associated with various features, technologies, and food remains. Summed probability distributions (SPD) offer a first order approximation of chronological trends and a means of comparing multiple dated phenomena, but it is difficult to isolate boundaries, or beginning and ending periods of date phenomena, using SPDs. Bayesian modeling, kernel density estimation, and examining SPDs using exponential null models offer a means to address such problems, allowing for boundaries and events to be isolated and refined. However, some methods may obscure the underlying temporal variability of certain chronological data and thus fail to isolate important trends and transitions. A comparison of various methods is presented, demonstrating that multiple approaches and multiple data groupings offer a reasonable solution. The Hallstatt interval of 2700–2350 BP provides a useful test case for the comparison.

**Miller, Naomi (Univ of Pennsylvania Museum & ISAW)**

[131]

*Discussant*

**Miller, Virginia (University of Illinois at Chicago)**

[154]

*The Disembodied Eye in Maya Art and Ritual Practice*

The ritual use and display of skulls, digits, and femurs is well documented in Mesoamerica. But except for the heart, few sources describe how organs and soft body tissues were curated during the brief time they could have been viable for manipulation or display. Nevertheless, there is rich corpus of Mesoamerican art demonstrating that such exhibitions must have taken place. While stylized eyes are a common motif, particularly in central highland Mexico where they sometimes stand for heavenly bodies, naturalistically represented eyes are typically Maya. Extruded eyeballs, often with the optic nerve still attached, form part of the iconography of death, particularly on Classic period ceramics. Detached pendant eyeballs sometimes serve as adornments for humans and non-humans. The active power of sight is demonstrated by the practice of mutilating the face, and especially the eyes, of nobles represented in Late Classic sculpture and paintings. But did the ancient Maya take out and display the eyes of the defeated? Crania from Chichen Itza show evidence of eyeball extraction, suggesting that eyeballs were removed, presumably from sacrificial victims, and manipulated postmortem. Significantly, eye motifs become more prominent during the Terminal Classic period, now appearing independently and on a monumental scale.

Miller, Virginia [154] see Tiesler, Vera

**Mills, Barbara (University of Arizona)**

[79]

*Discussant*

**Mills, Rebekah (Villanova Law School; SIPA, Columbia University), Lauren Brooks (PaleoWest Archeology), Rachel Brody (Boston College), Valerie Watson and Zoe Merod (Ithaca College)**

[153]

*Female Firsts: Hidden Figures: The Women of Irish Archaeology*

In 2018, among the top five hashtags in Ireland was #repealthe8th. On May 25, 2018, the amendment that largely banned all abortions was repealed. With this vote, many Irish women felt their voices were finally heard. With women's rights and activism at the forefront in Irish politics how has the role of women in Irish archaeology changed? Following a similar trajectory to women in American archaeology, those in Ireland faced similar plights. Until the building of the National Museum of Ireland in the late

nineteenth century, the Royal Irish Academy (RIA) and the Royal Society of Antiquaries of Ireland (RSAI) held Ireland's archaeological and antiquarian collections. Today, these societies continue to be influential in defining Irish archaeology. Yet, it was not until 1949 that the first woman was admitted as a full member to the RIA. The RIA, today, writes that "the profession [of archaeology] is one of the most gender-equal professions in Europe"; historically that has not been true. Who and where are women in Irish archaeology? We will explain how women have been active in archaeology well before they were officially invited and the many contributions they have and continue to make in Irish archaeology.

**Minc, Leah (OSU Radiation Center), Marcus Winter (INAH, Oaxaca, Mexico) and Cira Martínez López (INAH, Oaxaca, Mexico)**

**[171]**

*Intra-valley Exchange before the Rise of Monte Albán: New Data from Trace-Element Analyses of Rosario Phase Ceramics*

The Rosario phase (ca. 700–500 BCE) in the Valley of Oaxaca, Mexico, represents the period immediately preceding the rise of Monte Albán and the earliest stages of Zapotec state formation. Relatively little is known about intra-valley interactions during this time, beyond interpretations based on settlement pattern analyses. As part of our ongoing INAA program to assess ceramic exchange in the valley, we here present provenance data on more than 1,000 ceramic vessels drawn from well-dated Rosario ( $N = 668$ ) and Rosario/MA Early I ( $N = 230$ ) contexts from sites in all three arms of the valley. Comparisons of their chemical signatures with natural clays collected throughout the valley, as well as with wasters from known ceramic production sites, have allowed us to distinguish more than 20 distinct ceramic-producing regions and to track the movement of different pottery wares within the valley. Our results indicate a much greater degree of exchange interaction than expected and have significant implications for understanding the economic and political geography of this key time period.

**[171]**

*Chair*

Mink, Kirsten Green [23] see Ellis, Olivia

**Miron Marvan, Esteban**

**[147]**

*History and Archaeological Heritage and the Modern Maya*

Modern Maya peoples have been denied of their right to appropriate their own history and archaeological heritage. After almost three decades of multiculturalism in Mexican laws and state rhetoric there is still a lot of colonial ideas, practices, and laws that prevent the participation of indigenous communities in the heritage discourses and their involvement in the management of archaeological heritage. This paper is about the current perceptions of history, archaeology and heritage among the Maya Ch'ol of northern Chiapas, who have articulated, without the help and despite the Mexican national state, a sense of history and time in their landscapes. The Ch'ol and the modern Maya peoples are interested to hear from the words written by the Classic Maya in languages related to what they speak now, and they have their own questions to ask the historical and archaeological record. They want the world to know that they walk next to us carrying the wisdom of their ancestors.

**[147]**

*Chair*

Misarti, Nicole [9] see Alfonso-Durruty, Marta

Misarti, Nicole [179] see Hambrecht, George

Mitchell, Spencer [152] see Cortes-Rincon, Marisol

Mitchell, Spencer [194] see Mailler, Mary

Mitrovica, Jerry [100] see Borreggine, Marisa

**Mizoguchi, Koji (Kyushu University, Japan) and Junko Uchida (Institute of History and Philology, Academia Sinica)**

**[141]**

*The Renewal of Remembrance and Political Order: An Example from the Late Shang, China*

The role played by the remembrance of certain events and/or individuals in the reproduction of social order and power relations has been investigated from various social archaeological perspectives. One of the important issues emerging out of this developing research area is how a specific mode of such remembrance is related to a specific mode of social/power relations and to the specific problem(s) of their reproduction. By examining how different manners of remembrance were implemented at the cemetery area of the Xiao-tun Late Shang palace site, Anyang-Yinxu, this paper will reveal how different social problems led to the emergence of different modes of remembrance and memorialization of the ancestral kings.

Mlyniec, Michael [148] see Fitzhugh, William

**Moe, Jeanne (Institute for Heritage Education)****[126]***Ruthann Knudson: Legacy of Public Education and Outreach*

Ruthann Knudson was always a proponent of archaeology education and public outreach. As her student at the University of Idaho, I got to see Ruthann in action early in my career. Ruthann's dedication to involving the public stuck with me and everywhere I went for school and employment, I volunteered to go to schools for presentations on archaeological inquiry and stewardship. While working for the Bureau of Land Management in Utah, I was lucky to be a founding member of the National Project Archaeology program, which now serves nearly 40 states with high-quality archaeology education for teachers, students, and informal educators. After retirement, Ruthann moved to Montana and true to form, became a force to be reckoned with in archaeology and public outreach. Ruthann was an inspiration, a friend, and mentor to all. This paper traces Ruthann's influence on archaeology education and the history of Project Archaeology and the program's impact on the profession.

Moffat, Ian [151] see Phillips, Natasha

**Mollenhauer, Jillian (Metropolitan State University of Denver)****[107]***Out of Olmec: Continuity and Disjunction in Veracruz Stone Sculpture*

Gulf Olmec sculpture is renowned for the cultural, political, and aesthetic precedents it helped to establish in preconquest Mesoamerica. Often its legacy is discussed in relation to the artistic traditions of succeeding civilizations that emerged to the south and west of Olman. However, there has been little recognition of the impact Olmec sculpture had on the later cultures of Veracruz. Many examples of Gulf Coast sculpture outside the Olmec heartland have remained virtually ignored by scholars, likely as a result of cultural biases rooted in Western aesthetic sensibilities and the tendency to elevate certain categories of representation over others. Yet, in overlooking these objects we have neglected to see the patterns of continuity and disjunction in Gulf Coast sculpture that lead us from the monuments of the Olmec to those of their Classic and Postclassic successors. This paper attempts to trace these routes of affect and influence through the sculptural traditions of ancient Veracruz.

**Monaco, Farrell (University of Leicester)****[73]***Discussant***Monaco, Farrell (University of Leicester)****[191]***Panem Bonum Fert: The Panis Quadratus as an Archaeologically Defined Cereal Grain Consumption Metric in First-Century Rome*

This study is focused on cereal grain consumption in ancient Rome and the food value of the commercially produced Roman bread product, the Panis Quadratus, in the Roman daily diet in first century AD. While some Roman-era cereal grain consumption estimates have been published in recent decades, no study has yet attempted to consider the assemblage of carbonized Panis Quadratus loaves, excavated primarily from one commercial bakery at Pompeii, as an archaeologically defined source of cereal grain consumption data. Taking into account these previously published scholarly estimates, this study aims to determine if an archaeologically defined model can test existing non-archaeologically based estimates and contribute further to the conversation of cereal grain consumption in the Roman daily diet. This study uses an interdisciplinary methodology of quantitative, compositional, and morphological analyses of original archaeological specimens, coupled with experimental archaeology and mathematical modeling to produce a daily cereal grain consumption estimate for an average Roman consumer. The results of this study have shown that testing consumption estimates based on non-archaeological sources against an archaeologically defined model, which is based on a fully processed cereal grain product, provides a more realistic estimate of cereal grain consumption in first-century Rome.

**Monaghan, John (University of Illinois at Chicago), Caleb Kestle (University of Illinois, Chicago), James Meierhoff (University of Illinois, Chicago), David Reid (University of Illinois, Chicago) and Richard Elliot (University of Illinois, Chicago)****[38]***Enquête for a Geographic Approach to the Recovery of MIAs in the Philippines*

Taking the form of an *Annales enquête*, this poster outlines a systematic approach to the recovery of remains of service personnel who are classified as Missing in Action from World War II from within a specific geographic area. It discusses the research program, the kind of data sources, and the way a spatial approach to the problem of MIA recovery can enhance recovery efforts.

**Monge, Susan (University of Illinois at Chicago)****[178]***A Tropical Treasure Trove: Preliminary Assessment of Archaeological Faunal Remains from Culebra Bay, Guanacaste, Costa Rica*

For over 50 years, excavations in Guanacaste, Costa Rica, have yielded a large amount of well-preserved faunal materials, yet few zooarchaeological studies have been carried out. To explore the research potential of archaeofaunal materials in the region, I will present data from several sites around the Culebra bay area. These preliminary results indicate that animals held diverse roles within these societies that can be further studied to better understand human behavior and human-environment interactions. The remains of various turtle species (Emydidae, Kinosternidae) found in burials with associated human crania suggest these may have had a cosmological role or served as indicators of social organization and status. The historical presence of coyotes (*Canis latrans*) in the area is suggested by faunal evidence as well as ethnohistorical accounts. Complete canine burials (*Canis* sp.) are found

throughout the bay, although their meaning remains unclear. Furthermore, the possible presence of domestic turkeys (*Meleagris* sp.) enhances knowledge about animal management and connections to long-distance trade routes in this multicultural region. The presentation of these preliminary results expands the knowledge of zooarchaeological assemblages from Central America and the potential for future research, where ancient DNA and stable isotope analyses could complement the visual morphometric analyses.

Monin, Alex [33] see Engen, Danica

**Montgomery, Lindsay (University of Arizona), Michael Adler (Southern Methodist University) and Richard Mermejo (Picuris Pueblo)**  
[145]

*Emergent Economies in the Northern Rio Grande: Agricultural Intensification and the Picuris Pueblo Trade Network*

The first documented reference to Picuris Pueblos' role in the growing farmer-forager exchange network of the northern Rio Grande is attributed to Gaspar Castaño de Sosa, who reported in 1591 that "a long arquebus shot from this pueblo there were foreign people [nomads] who had come to this [place] for refuge" and trade (Schroeder and Matson 1965:124). A few years later, a Spanish expedition to the Plains encountered a group of Vaqueros Apache returning to the Plains with corn obtained at Picuris and Taos (Spielmann 1991:8). While such documentary indicates that by the sixteenth century, Picuris was a bustling regional economic center, the origins of this trade network and its evolution prior to colonization remains largely unexplored. Recent fieldwork by the Picuris Pueblo Project—a collaborative research endeavor between Picuris, Southern Methodist University, University of Arizona, and Barnard College—has produced new insights into the size and complexity of Picuris' ancestral landscape over time. This paper will present the preliminary findings of two seasons of intensive landscape survey at Picuris, which suggest that Picuris may have been engaged in some of the earliest forms of terrace agriculture in the northern Rio Grande.

**Montgomery, Shane (University of Calgary)**  
[56]

*Discussant*

Montoya, Amy [183] see McBrinn, Maxine

Monzon, Juan [5] see Hatcher, Lawford

**Moody, Bryony (University of Sheffield), Caitlin Buck (University of Sheffield), Thomas Dye (University of Hawaii, Manoa), Keith May (Historic England) and Gianna Ayala (University of Sheffield)**  
[97]

*Automation of Bayesian Chronology Construction Using a Graph Theoretic Approach*

This paper discusses developing prototype software for handling the relative and absolute dating evidence obtained during single context excavations as carried out in many European countries such as the UK. We seek to use mathematical graph theory to manage both stratigraphic and chronological information during Bayesian chronology construction. Dye and Buck have developed a graph theoretic approach to representing archaeological sequence diagrams, such as the Harris Matrix. Dye and Buck proposed that, by managing stratigraphic and chronological data using graph theory, we might semi-automate chronology construction. The primary research question addressed in this presentation is: Can we build a practical user interface for creating, managing, and archiving both stratigraphic and chronological directed graphs, such that it semi-automates the building of Bayesian chronological priors during post-excavation interpretation and research? We use case studies from various large-scale excavations to display current capabilities of the software; in particular, the various options being explored for manipulating stratigraphic data, such as adding metadata, point and click capability, and the display of multiple directed graphs. A further research goal for the project is to allow for the consideration of uncertain stratigraphic relationships during the modeling process. Progress in this area will be explored.

**Moore, Jerry (CSU Dominguez Hills)**  
[106]

*Communities of Practice and Ancient Andean Houses*

Comparative ethnographic and ethnoarchaeological case studies of house construction demonstrate the significance of communities of practice in the construction and maintenance of houses in the Andes. Key phases of house construction and maintenance similarly draw on communities of practice that extend beyond the residence group. Except for some of the earliest houses known from the Andes, essentially every Andean house requires more labor than the residence group can provide, at least at some specific phase (e.g., framing or acquiring roofing materials, etc.). This necessarily draws on a community of practice, which is significant because many prehispanic and contemporary settlement patterns are characterized by dispersed homesteads. Therefore, communities of practice based on house building and maintenance can be major integrative social networks, often paralleled by other forms of mutual aid or ritual obligations. Yet those communities of practice will not be identical for various reasons, specifically because different types of domestic architecture engage with distinct materials, building methods, and trajectories of use, remodeling, abandonment, and recycling. I argue that archaeologists should realize that the specific domestic architecture they are excavating was the creation by not only its inhabitants but this larger social field represented by communities of practice.



**Moragas, Natalia (University of Barcelona.)****[177]***"Closed by Refurbishment": A General Overview of Teotihuacan from Classic to Epiclassic Times*

The aim of this paper is to do a general overview of the different archaeological processes identified in Teotihuacan in the last years of the Classic to Epiclassic period. In a space between the crisis of the Teotihuacan political and ideological power until the reorganization of new players in the Basin of Mexico, the city had to be "closed" and redefined in a new world.

Moragas, Natalia [101] see Pecci, Alessandra

Morales, Pedro [72] see Somerville, Andrew

**Morales, Reinaldo (Norfolk State University)****[53]***Baumgarten's Aesthetica and the Rock Art of Northeast Brazil*

Alexander Baumgarten's *Aesthetica* gave birth to modern aesthetics. He had in mind a specific relationship between human cognition and sensory perception. Originally, aesthetics was the "science of sensitive knowing" (*scientia cognitionis sensitivae*), or the study of how we know the world through our senses (sensing it) rather than through rational cognition (thinking about it). A generation later, Immanuel Kant decentered Baumgarten's aesthetics and reoriented it toward the Beautiful and the useless. This now overshadows Baumgarten's original and more productive aesthetics resulting in a grand distraction: assertions that aesthetic sensibility is reliant on Western notions of beauty, that beauty is a necessary condition of art, and that usefulness eliminates any possibility of either beauty or art. In American archaeology we see this as claims that aesthetics and art are of little use in the study of non-Western or prehistoric image making and reception. This is unfortunate. When we honestly engage Baumgarten's science of sensitive knowing in the study of northeast Brazilian rock art, we gain a deeper understanding of the diversity and sophistication of Indigenous art and aesthetic discourse.

**Morales-Aguilar, Carlos (Université Paris 1 Panthéon-Sorbonne) and Christophe Helmke (University of Copenhagen)****[48]***In the Land of the Codex-Style Ceramics: New Insights on Classic Maya Settlement Organization in Northern Petén, Guatemala*

Since the archaeologist Michael Coe dubbed "Codex-style" ceramics to a group of polychrome vessels coming from northern Guatemala and southern Campeche, many scholars have given attention to study this pottery produced during the Late Classic period. However, little is still known about the archaeological context of these ceramics and its relation to local settlement organization. The northern Petén underwent significant transformations between the Early and Late Classic periods, which is marked by the increase of population caused by the expansion of the Kaanul dynasty to the southern Maya lowlands. The "Preclassic" cities such as El Mirador and Nakbe were reoccupied, and new settlements emerged in a particular pattern of residential groups clustered around central plazas with causeways. The demographic apogee of the region during the late seventh through the middle eighth centuries coincides in time with the production of Codex-style vessels. Based on settlement patterns studies and spatial analysis, this paper provides new evidence from 36 archaeological sites with this ceramic style that will contribute to our understanding of the Late Classic settlement organization in this particular region of the Maya lowlands.

Morales-Aguilar, Carlos [48] see Ensley, Ross

**Morehart, Christopher (Arizona State University), Angela Huster (Arizona State University), Dean Blumenfeld (Arizona State University) and Eunice Villasenor Iribé (Arizona State University)****[177]***Creating the Pax Tolteca: Diversity, Autonomy, and Centralization from the Epiclassic to the Early Postclassic Periods in the Northern Basin of Mexico*

This paper studies the role that economic and ecological diversity plays in the establishment of communities, the maintenance of sociopolitical autonomy, and the centralization of regional state power. We focus on the transition from the Epiclassic period in the northern Basin of Mexico, a time marked by a decentralized constellation of relatively autonomous political centers and communities, to the Early Postclassic period, a time that witnessed the hierarchical centralization of a regional state system centered at Tula. We assess the role that ecological and economic diversity played at local and regional levels during this period of political transformation. Specifically, we address (1) if diversity in local economic and ecological relationships was essential to community stability and political autonomy during the Epiclassic period, and (2) if transforming such diversity in content, scale, and form was an essential component to the establishment of a regionally integrated political economy during the Early Postclassic period.

Morehart, Christopher [155] see Villasenor Iribé, Eunice

**Morell-Hart, Shanti (McMaster University)****[156]***One Tamale, Four Digestions*

Drawing from long-established fields in anthropology (structuralist, semiotic, identity-oriented, subsistence-focused, human ecological, and many others), food scholars have actively developed hybrid perspectives and novel pursuits. Here, I focus on four: modeling foodways linguistically, theorizing gastropolitik, situating the agency of food, and considering the emergence and ramifications of gastronomic heritage. I present an overview of each approach: the origins, the grounding literature, and the general

framework. I then address how each has been mobilized in archaeological investigations, using several case studies. By addressing the applications and implications of these approaches in theorizing food, I highlight what each can help to accomplish in foodways research as a complementary perspective to other paradigms and understandings. I suggest how these toolkits might contribute directly to interpreting cultural logics and improvisations, understanding the role of food in sociopolitics, expanding notions of agency, and critically applying ancient foodways research to issues in the contemporary world. I use a single tamale meal—whose residues were recovered archaeologically from the Classic Maya city of Piedras Negras—as the focus of these ruminations.

Moreno, María Olvido [180] see Filloy, Laura

**Morett-Alatorre, Luis (Universidad Autónoma Chapingo), Joaquín Arroyo-Cabrales (INAH) and Xolotl Morett-Muñoz (Pixcani Huehuetlatolli)**

[33]

*Formation and Chronostratigraphy from Unit UE1, Tocuila Archaeo-Paleontological Site, Mexico*

Based on the findings of extinct animal remains in Tocuila, Municipality of Texcoco, State of Mexico, in 1996, a study of a large Late Pleistocene deposit was initiated, excavating an initial unit (UE1), 30 m<sup>2</sup> and 3.35 m depth, located on a deltaic paleochannel in the old lacustrine riverbank, which eventually was filled up by a series of mudflows. Inside this unit, 1,300 bone remains were recovered, mostly pertaining to the Columbian mammoth (*Mammuthus columbi*), some with helicoidal fractures and evidence of cultural modifications. In addition, remains of other animals in much lesser abundance were found, like camelids (*Camelops hesternus*), Pleistocene horses (*Equus* sp.), bison (*Bison* sp.), rabbit (*Sylvilagus cunicularius*), vole (*Microtus mexicanus*), and even some vertebrae from a large feline. Description of the processual characteristics for UE1 deposit formation are outlined and illustrated, with its Pleistocene chronostratigraphic sequence (14,500–10,000 BP). Furthermore, deposit context within the whole 60 ha Tocuila deposit is shown with more than 20 findings in the last 50 years, with UE1 being just a small sample of the enormous richness.

Morett-Alatorre, Luis [33] see Arroyo-Cabrales, Joaquín

**Moretti, Alexia (Sorbonne Université)**

[90]

*The Modern Recontextualization of Recuay Stone Sculptures: Process and Consequences*

Stone sculptures played a crucial role in socio-religious practices of the Recuay people between AD 100 and 700 in the north-central Peruvian highlands. Associated with ceremonial, funerary, and residential spaces, Recuay sculptures were objects of cult and veneration. Today, most of the surviving sculptures persist in the inhabitants' lives of this mountainous region. Relocated, reused, and sometimes replicated, how do these sculptures integrate into the current social landscape, and what are the consequences of this modern recontextualization? By questioning the Recuay sculptures' case, this presentation leads us to reflect on how the relationships between people and their cultural heritage can positively and negatively impact heritage.

Moretti-Langholtz, Danielle [163] see Woodard, Buck

Morett-Muñoz, Xolotl [33] see Arroyo-Cabrales, Joaquín

Morett-Muñoz, Xolotl [33] see Morett-Alatorre, Luis

**Morgan, Christopher (University of Nevada, Reno), Gustavo Neme, Adolfo Gil, Clara Otaola and Miguel Giardina**

[175]

*Risk Seeking and Risk Mitigation in the Argentine Andes*

Using the Z-score model, we evaluate the costs and benefits of risk-seeking behaviors, and the means by which risks were mitigated, at El Indígena, a massive high-altitude residential site in the south-central Andes. Our model suggests that though climatic amelioration during the site's main period of occupation (1500–800 cal BP) may have played a subsidiary role in reducing some of the risks associated with long-term and intensive high-altitude occupations, the probability of increased social rewards likely played the principal role in encouraging long-term, seasonal site occupations. Some of the risks associated with these occupations were offset by transport of foodstuffs from lower elevations.

Morgan, David [146] see Lubkemann, Stephen

**Morgan, Linda (GRIC Cultural Resource Management Program), John Hoffman (GRIC CRMP), Kyle Woodson (GRIC CRMP), Chris Loendorf (GRIC CRMP) and Brian Medchill (GRIC CRMP)**

[87]

*Hohokam Pottery Manufacturing Specialization at Lower Santan Village Along the Middle Gila River, Southern Arizona*

The Gila River Indian Community Cultural Resource Management Program completed extensive data recovery at Lower Santan Village with more than 2,500 cultural features investigated at this prehistoric Hohokam settlement. The village is located on the north side of the middle Gila River, along the southwestern flank of the Santan Mountain bajada. The village reached its maximum extent in the late Sedentary period around AD 1150, and subsequently declined in size dramatically in the Classic period (AD 1150–1450). Previous work shows that pre-Classic period structures at the site have a disproportionately high incidence of pottery manufacturing tools, and recent investigations identified a pit house with an exceptional density and diversity of pottery production items. The room

assemblage included raw clay, wasters, pottery anvils, polishing stones, and more than a dozen finished vessels. The house had a high incidence of nonlocal items like shell jewelry, but was otherwise similar to other habitations that have been investigated, and appears to have been a residential structure. These data suggest that this household specialized in pottery production, possibly on a full-time basis. This paper examines the unique pit house artifact assemblage in the context of evidence for specialized pottery production at Lower Santan Village.

**Morris, Julia**

[145]

*On the Road and in Place: A Material History of the New Buffalo Commune, New Mexico*

The New Buffalo Commune of northern New Mexico was a countercultural mecca during the late 1960s and 1970s, drawing in young folks from around the country who sought escape from the industrialism, capitalism, and militarism of mid-twentieth-century American society. It was a community of those who were looking to return to lost relationships with the environment through active agricultural and spiritual work. Despite the commune's ideological focus on renewed relationships with the land, its occupants were highly nomadic, most passing through New Buffalo and other communal living arrangements on Kerouac-inspired expeditions. In this paper, I explore the material culture of these restless American nomads and the cultural ramifications of fluid community-building through the objects they left behind, asking: what did it mean for the Hippies of the 1960s New Mexico to occupy, have influence on, and be of a place?

**Morris, Margaret (Scripps Institution of Oceanography, UCSD), Isabel Rivera-Collazo (Scripps Institution of Oceanography, UCSD), John Hildebrand (Scripps Institution of Oceanography, UCSD) and Petr Krysl (University of California, San Diego)**

[1]

*Simulated Underwater Acoustic Detection of Knapped Stone*

Acoustic methods for exploring the underwater landscape contribute to the effectiveness of underwater archaeology research, largely by allowing efficient mapping of the seafloor and sub-bottom. Detection and identification of specific materials and artifact types within archaeological landscapes is an important step in using this technology to efficiently identify and map archaeological sites. Ole Gron and others have noted that knapped flint appears to show a distinct signal in acoustic return data. To understand what causes this signal and how to identify it, we perform finite element simulations of the acoustic response of knapped stone in seawater and sediment. We create 3D models of individual lithics using small scale photogrammetry. We run a combined finite element and boundary element simulation to model the returned intensity of the lithics at frequencies ranging from 1 to 200 kHz. We systematically characterize the response from individual lithics by material and dimension, and of assortments of lithics by lithic density and seafloor coverage. These results will be compared with acoustic return data from previously mapped underwater archaeological sites as well as further experiments.

**Morrisset, Sara (University of Cambridge), George Chauca and David Beresford-Jones**

[128]

*New Perspectives on the Ica Society: Tracing Changes in Material Culture in the Ica Valley on the Peruvian South Coast from the Middle Horizon to Early Colonial Period (ca. 1000–1600 CE)*

For nearly 600 years the Ica society flourished in the vast deserts of the Peruvian south coast. Rising to considerable regional influence during the Late Intermediate period (ca. 1000–1476 CE), little is known of its origins or later years. Our recent excavations in the lower Ica Valley have begun to address these gaps in our knowledge and shed further light on the era of Ica prosperity during the Late Intermediate period. Through investigating the formative years after the fall of the Wari, this work also questions the orthodox story of a cultural and demographic collapse within the Ica Valley around 1000 CE. This paper will outline the major finds of our excavations in the Ica Valley, including the discovery of two quipu and a potential spondylus shell workshop. Our excavations have also yielded abundant evidence of long-distance trade in the Ica Valley by camelid caravans that mobilized exotic goods from as far as modern-day Ecuador and the Amazonian Basin. Ultimately, this work traces changes in Ica material culture to better understand shifting patterns of cultural connectivity as well as the process of collapse and emergence of new sociopolitical identities, which has implications for the study of other Andean contexts and beyond.

**Morrow, Juliet (Arkansas Archeological Survey)**

[126]

*Arene Candide to Anzick: Ritual Use of Red Ochre*

Use of ochre occurs from Paleolithic times to the present. I am interested in when and how humans first used it symbolically. The color red has symbolic importance that crosscuts cultural boundaries in African, Australian, and Native North American societies. Ochre lumps, particularly red ochre, and powder indicate symbolism and ritual behavior dating back to the MSA in Africa. For hunting societies of the Eurasian Upper Paleolithic and New World Paleoindian periods, red ochre was probably meaningful regardless of its use-context. Societies in both regions sprinkled ochre in a pulverized powdered form over human burials and placed lumps of ochre in graves. They also cloaked associated funerary offerings with red ochre, and sometimes included ochre on the bones of large mammals that they were known to hunt. Red ochre as an earth material may have been venerated based on an interpretation offered by Stafford and colleagues for the Powers II Red Ochre Mine in Wyoming that Clovis and other individuals were depositing offerings of projectile points to the red ochre. This paper describes the elements of the spiritual system within which ochre was used in the Clovis era.

**Morucci, Katherine (University of California, Davis)**

[33]

*Toward an Epidemiological Model of Sarcoptic Mange among Andean Camelids*

Sarcoptic mange is a highly infectious, zoonotic disease endemic to modern Andean camelid populations. Severe infection can result in the loss of wool and death of the animal. Rapid spread can lead to significant economic losses and population instability. Despite widespread awareness and preventative measures taken by modern camelid herders, the dynamics of mange and its archaeological consequences in early Andean herds remain poorly understood. The differential preservation of skeletal remains over other connective tissues, which are more likely to harbor evidence of pathophysiology, make it difficult to identify the disease and its effects in the archaeological record. New analytical approaches may allow us to examine previously elusive lines of evidence that extend beyond skeletal indicators. This study derives an epidemiological model of sarcoptic mange transmission from pathogen and host behaviors, paying particular attention to archaeologically detectable outcomes related to identification of ectoparasite exoskeletons, soft tissue histological structures, and mortality profiles. This working model is a key component toward advancing an archaeologically relevant ecological framework for understanding camelid disease dynamics in the Andes.

**Moses, Victoria (University of Arizona)**

[129]

*Sacrifice, Meat Consumption, and Bone Working at the Curiae Veteres: Zooarchaeological Findings from the Sixth- and Fifth-Century BCE Levels of the Palatine-Pendici Nord-Est Excavations in Rome, Italy*

Recent archaeological projects, such as those of the Palatine-Pendici nord-est excavation, are bringing new materials and new clarity to the processes of social change that lead to urbanism in Rome, Italy. The Curiae Veteres sanctuary, located in the heart of Rome on the northern slopes of the Palatine Hill, gives exceptional insight into the earliest rituals of Rome. Here, the large deposits of animal remains dating to the sixth and fifth centuries BCE mostly relate to three activities: animal sacrifice, communal consumption, and bone working. These faunal materials are evidence for early Roman ritual, social structure, and economy. The remains are mostly from the common domesticates across early Roman sites, including pig, cattle, and sheep/goat. However, dog crania and paws, complete cattle skulls with perforations for affixing the skulls to walls, and a range of wild animals such as owl, vulture, crow, and seabass show the diversity in the offerings and significance of animals at the site. Partially worked cattle metapodials and deer antlers were abundant, showing the development of a new industry in the area. The activities conducted at the Curiae Veteres during the birth of Rome laid the groundwork for the city that followed.

**Moss, Madonna (University of Oregon) and Amy Shannon (University of Oregon)**

[72]

*Alutiiq Use of Birds during the Ocean Bay Period at Rice Ridge (49-KOD-363), Kodiak Island*

Rice Ridge (49-KOD-363) is a deeply stratified archaeological site on Kodiak Island, with well-preserved faunal remains dated to the Ocean Bay tradition (7600–4200 cal BP; Kopperl 2003, 2012). The site contained an extensive bird bone assemblage that has not been analyzed before now. Casperson (2012) studied bird bones from Mink Island (49-XMK-030), located off the nearby Alaska Peninsula, and found that birds played important roles in the lifeways of Ocean Bay groups, even though these people have been conventionally portrayed as primarily dependent on marine mammals and fish. With this contemporary assemblage from Rice Ridge, we show that birds, especially cormorants, ducks, murre, and geese, were vital to Alutiiq ancestors on Kodiak Island, and that the relative abundance of bird taxa changed over three occupations within the Ocean Bay period. Alutiiq ancestors consumed birds as food, but also processed quantities of birdskins for clothing that was crucial to their survival.

Motta, Laura [13] see Dorr, Lana

Motti, Josefina [55] see Nores, Rodrigo

**Moyes, Holley (University of California, Merced), Harriet Beaubien (Smithsonian Institution) and Erin Ray (University of New Mexico)**

[158]

*Lost Rites of the Ancient Maya: Esoteric Rituals in Caves*

Over the past 30 years archaeologists have made large strides in understanding the function and meaning of ancient Maya ritual caves sites. Ethnographic analyses have made major contributions to interpretive efforts and advanced the field in innumerable ways. Throughout Mesoamerica, there have been many long-term sustained projects, both regional and site specific, that have investigated literally hundreds of caves. This has facilitated comparative approaches between Mesoamerican cave sites, enabling researchers to establish similarities in how caves were used as well as to address regional differences. Patterning in ritual assemblages is often noted, but what goes relatively unnoticed or underrepresented in published works are isolated instances of cave use that I refer to as “lost rites.” These rites are suggested by features and artifact assemblages that are not tied to established patterns and have no obvious analogs in the ethnographic literature, rendering them very difficult to interpret. The Las Cuevas Archaeological Reconnaissance in the Chiquibul Forest Reserve in western Belize documented a number of these esoteric rites. In this paper, I will report on one of the oddest cave deposits encountered by the project—the mysterious molded deposits in Eduardo Quiroz cave.

**Moyes, Leah**

[101]

*Diamonds in the Rough: What Do the Sculpture Fragments Discovered in the Teotihuacan Mapping Project/Ground Stone Collection Tell Us about the Social Organization of the City?*

The study of sculpture at Teotihuacan—as at many other sites—has traditionally focused on larger, more elaborate sculptures from civic-ceremonial contexts. As a result, less is known about the distribution, ubiquity, and diversity of the use of sculpture in other

contexts and, specifically, what relation it has to the social organization of the city. Using the housing typology classifying high-, intermediate-, and low-status residencies from René Millon's historic Teotihuacan Mapping Project and recently reconstructed by Dr. Michael E. Smith, we present a typological classification and spatial analysis of the sculpture fragments systematically collected at Teotihuacan. After individually classifying the sculptural fragments from the surface collections by form and stone type, we find the greatest assemblage (66%) originates within the high-, intermediate-, and low-status residency categories, and (34%) have been identified outside of these defined parameters, such as markets, temple platforms, workshops, or streets. In this paper, we will present further analysis of the diverse types of sculpture fragments in relation to specific structures, their distance to socio-religious spaces, such as the Street of the Dead, and what role they play in understanding more about the social organization of the city.

**Muianga, Décio (University of Uppsala), Enio Tembe (Kaleidoscopio) and Sheila Machava (Kaleidoscopio)**

**[124]**

*One Hundred Years of Mozambican Archaeology: Past, Present, Future, and Challenges*

Mozambique, as a country located in the East as well as Southern Africa, has a diversity of important archaeological remains uncovered in the last 100 years as a result of individual enthusiasm and systematic academic research. However, large parts of this past remain poorly explored and Mozambique's archaeological heritage is still largely explained in terms of better known sequences to the south, west, and north. This essay examines chronological and archaeological methods, heritage policy, and practice in Mozambique through time. Drawing on archival research and interviews with practitioners, the essay problematizes current conventions regarding efforts to understand and explain the large body of data on Mozambique's past. Efforts to date have been done in a fragmentary manner. We show that more cooperation/sharing of results between archaeologists working on Mozambican prehistory and history is needed in order to engage with theory, methods and practice of the discipline. Thus, we argue that major challenges to archaeological practice in Mozambique are subsidiary to academic discussions on the disciplinary boundaries.

**[124]**

*Chair*

Muianga, Décio [124] see Fonseca, Sofia

Muianga, Décio [124] see Stempfle, Sabrina

**Mulder, Stephennie**

**[44]**

*The Ceramics of Balis: Toward the Recovery of Lost Heritage*

This paper will present a major new analytical study of an important Islamic period archaeological ceramics assemblage produced during 12 years of excavation of Balis, a medieval Syrian city. With over 1,000 photographs and drawings produced over my 10 years as head ceramicist on the site, this study will be among the most comprehensive Islamic archaeological ceramics studies published to date. Balis was a ceramic manufacturing center with hundreds of kilns, and the study has the potential to transform our understanding of medieval Islamic ceramic production, use, and aesthetic value—particularly for early Islamic ceramics, about which is little known. Publication of this catalog is more urgent than ever because Balis has been under the control of various groups in the Syrian conflict, including ISIS, and looting has been extensive. This project, then—aside from its archaeological value—will form one contribution to cultural heritage preservation in a region endangered by war.

**[44]**

*Discussant*

**Muller, Jordin, Shannon Boomgarden and Brendan Ermish**

**[41]**

*2019 Range Creek Excavation*

Through excavation methods the staff and students of the Range Creek Field Station looked to explore an indentation formation in a section of Range Creek known as the Cove. The hope was to uncover and explore the possibility of potential precontract irrigation systems. It is known that historic farmers would take advantage of preexisting irrigation ditches and then expand and use them for their own purpose. We sought to examine the indented feature with in the Cove to explore this possibility.

Muller, Jordin [41] see Boomgarden, Shannon

Muller, Letícia [66] see Kipnis, Renato

**Mullins, Patrick (University of Pittsburgh) and Brian Billman (University of North Carolina at Chapel Hill)**

**[159]**

*Transition in a Place Between: Salinar Phase (500 BCE–CE 1) Settlement Patterns in the Chaupiyunga of the Moche Valley*

In the Moche Valley, the dusk of Chavín brought the end of millennium-long traditions of large ceremonial centers (Guañape Phase, 1600–500 BCE) and ushered in a long period of sociopolitical fragmentation and endemic conflict (Salinar Phase, 500 BCE–CE 1). Synthesizing two full-coverage pedestrian surveys of the Moche Valley *chaupiyunga* conducted by Billman (1990–1991) and Mullins (2017–2018), we focus on *chaupiyunga* settlement patterns in order to better understand this period of sociopolitical transition and change. As the main coastal-highland borderland of the Moche Valley, the *chaupiyunga* landscape exhibits many scars of the ebb and flow of coastal and highland people and polities throughout prehistory. Our settlement pattern analyses use measures of visual interconnectedness and demographic tethering to articulate the changing connections built between peoples and places during the transition from the Guañape to Salinar Phases. Though Salinar Phase *chaupiyunga* populations were somewhat bound to the older Guañape Phase landscape and its huacas, they simultaneously were forging newer connections with newer places. We argue that

these new connections were intertwined with changing norms in land ownership and community organization, both of which contributed to the endemic conflict characteristic of this phase.

[159]

Chair

Muñoz, Lizette [115] see Weaver, Brendan

**Munro, Andrew (University of Oklahoma) and F. Joan Mathien (Chaco Culture NHP Museum Collection, Hibben Center)**

[46]

*Bonito Phase Architectural Syntax and Social Change*

In the San Juan basin, two multi-century ancestral Pueblo architectural traditions are well documented: orientations to the south-southeast and to the cardinal directions. Beginning in 2007, new surveys at 21 Great Houses and two stand-alone Great Kivas were conducted under a series of NPS and BLM permits. These surveys confirmed the two aforementioned traditions and identified two additional architectural traditions at Chaco. One group of Great Houses is oriented to the east-southeast, and many Great Houses are built at locations where solstice sunrise or sunset can be observed to interact with local horizon foresights. One or more of these four traditions are confirmed for every assessed structure save three. Temporal analysis of the four traditions provides an additional line of evidence for multi-cultural collaboration at Chaco during the Early and Classic Bonito Phases. In addition, the analysis highlights cosmological associations among Late Bonito Phase Great Houses at Chaco that clarify their likely purpose. Using multiple lines of evidence to provide context, we suggest that Late Bonito Phase Great Houses (esp. "McElmo Units") were designed as spaces for performative ritual activity conducted by regional antecedent sodalities that had detached from elite lineages during the period after 1100 CE.

**Munro, Kimberly (Metropolitan State University of Denver)**

[159]

*Revitalization and Acts of Renewal at the Kareycoto Mound: The Terminal Early Horizon at the Cosma Complex, Ancash, Peru*

This paper examines the Upper Nepeña Valley, along the Jimbe River branch and its tributaries. Numerous Early Horizon centers were documented throughout the upper valley, with a distinctive settlement pattern and construction at sites within the lower and middle valley. Survey and excavation at the Cosma Complex highlighted a localized tradition of renewal rites and infant interments occurring between 700 and 300 BCE. Re-utilization of the large Late Preceramic mound known as Kareycoto for feasting activities in conjunction with juvenile and infant interments are distinct markers for Cosma. Carbon dates have pointed to a lull in use of Kareycoto, from the initial period until approximately 700 BCE, corresponding to the transitional time period after Chavín's collapse. At this point, Kareycoto is reinterpreted as a center for revitalizing rituals associated with infant and other votive offerings. The reuse of this Preceramic mound to inter juveniles as the last construction phase may indicate the effort of the prehistoric Cosma community to retain and return to earlier localized traditions. Work in Cosma contributes to our understanding of post-Chavín activities in the central Andes, and how local people may have returned to former religious monuments in order to establish regional claims to local landscapes.

Munson, Gene [153] see Greer, Mavis

**Munson, Jessica (Lycoming College)**

[56]

Discussant

**Munson, Jessica (Lycoming College)**

[137]

*Living on the Edge: Alternative Network Models for Socio-spatial Analysis in Archaeology*

Recent studies using network analysis in archaeology seek to understand the interactions and structures that defined past societies. Such approaches are based on graph theoretic models that are simplifications of reality used to conceptualize and describe relationships, either qualitatively or quantitatively, between a set of components interacting in a social system. The appeal of this approach stems from its explicit emphasis on the relationships between the entities of interest. Frequently, those relationships are inferred based on the assumption that similarity in site assemblages is a proxy for the existence of a tie. This approach, however, runs the risk of circular reasoning if assumptions about the types of ties are not made explicit. Other approaches consider physical location and geographic distance for reconstructing archaeological networks. While the phenomena archaeologists study using networks is inherently both social and spatial, these models rarely take into consideration the broader landscape and natural features on which these processes play out. This paper presents an alternative approach to identify ancient communities based on dendritic network topology. The basic model is described and illustrated with a case study using settlement pattern data recently collected by the Proyecto Arqueológico Altar de Sacrificios from the Upper Usumacinta Confluence Zone.

**Murata, Satoru (University of New Hampshire) and Adam Kaeding (University of New Hampshire)**

[80]

*From Rural Hinterlands to Urban Centers: Investigating Ancient Maya Settlement in the Lower Belize River Watershed*

One of the primary objectives of the Belize River East Archaeology (BREA) project has been to identify and document archaeological sites in a relatively understudied part of north-central Belize that encompasses the lower Belize River Watershed. In this area, which measures roughly 6,000 km<sup>2</sup>, the BREA team has been pursuing such a goal with a suite of methodologies tailored

to the wide range of micro-environments characterizing the survey area. The methodologies employed include informant survey, pedestrian reconnaissance, and total station and unmanned aerial (drone) mapping, as well as surface/subsurface sampling and excavation. This has resulted in the identification of nearly 100 discrete archaeological sites comprising thousands of archaeological structures. Using a series of site typologies, we classify and compare the ancient Maya settlement in the lower Belize River Watershed, which ranges from urban political centers to rural residential hamlets. This regional settlement study demonstrates how site location and settlement histories were shaped by the micro-environments found in this low-lying coastal zone (i.e., the rivers, creeks, wetlands, estuaries, dense forests, open savannah, etc.) and how these natural features impacted people's movements and their relationships with the landscape as human-environment interactions changed through time.

Murata, Satoru [80] see Willis, Mark

**Murillo-Herrera, Mauricio (Universidad de Costa Rica) and Felipe Sol-Castillo (Universidad de Costa Rica)**

[178]

*Reconstructing Trajectories of Social Change: A Multiscale Approach Applied to the Valle Central Occidental, Costa Rica*

Since 2007, the project "Cambio social precolombino en San Ramón, Alajuela y sus alrededores" has aimed to reconstruct the trajectory of precolumbian social change (from at least 1000 BC to AD 1550) in this region of Costa Rica using systematic and standardized procedures. The most general and ambitious aim of the project is recording the development of an ancient society in southern Central America, as well as interpreting its social configurations and transformations. Two scales of analysis have been implemented in San Ramón within the framework of the project: at the regional level and the settlement level. The multiscale approach has allowed us to obtain a most comprehensive picture of the social developments in the region. The new data generated a picture of ancient social organization that is much more complex than the one provided by local traditional schemes.

**Muro, Luis (Pontificia Universidad Católica del Perú/Ministerio de Cultura)**

[69]

*From Discrete Frontiers to Cross-Cutting Religious Networks: Religious Monuments and Cultural Syncretism in the 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 a given cultural style parallels the area of influence of the groups that produced such style. This approach, however, fails to account the dissemination of intangible expressions of culture. In this paper, I seek to reposition 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 ninth to eleventh centuries AD. Particular and recurrent features in religious monumental buildings, from both the Peruvian north coast and highland, suggests that coastal and highland societies were interlinked not only through trade networks and political affinity, but also shared religious worldviews and death ideologies, which can be better understood as cross-cultural religious networks.

Murphy, Reg [194] see Brown, Matthew

**Murray, Brendon (Columbia University) and Terence D'Altroy (Columbia University)**

[118]

*A View from the Virú: Place and Sight in the Virú Valley Project Reconsidered*

Archaeological investigation on the north coast of Peru to this day draws from the 1946 Virú Valley Project; however, recent investigations have reevaluated chronologies and settlement hierarchies previously based on these data. Continuing these investigations, this paper revisits the valley to reconsider the idea of place and sight in the Virú landscape. Using GIS technology and archival records, this paper re-evaluates the sites excavated by Duncan Strong and the Columbia University Expedition with modern eyes, employing concepts such as allocentrism, fuzzy view sheds, and network theory. This paper analyses the sightlines and relationships between a number of major sites and the mountains around them

[118]

Chair

**Murray, John (Arizona State University, Institute of Human Origins), Scott Keohane and Andrew Zipkin (Arizona State University)**

[40]

*Experimental Identification of Heat-Treated Silcrete Using Colorimetry and Reflectance Spectrophotometry*

The heat treatment of stone for tool production represents one of the oldest technologies for transforming the material properties of a natural product to better suit human needs. The earliest evidence for such technology is the heat treatment of silcrete at the South African Middle Stone Age site Pinnacle Point 13B, ~164,000 years ago. Despite its importance for early human technology, relatively little is known about the origins of heat treatment due to methodological constraints faced by researchers. Traditionally, archaeologists identified heat treatment using color change determined by an expert analyst. This is a relatively reliable method, but it is difficult to replicate across analysts and studies. To address this issue, we used a UV-Vis-NIR spectrophotometer to record nanometer-scale wavelength reflectance and calculate CIE L\*a\*b\* color values for experimentally heat treated and unheated silcrete from three South African sources, with multiple nodules from each source. Results indicate quantitative colorimetry can discriminate between unheated and heat-treated silcrete with an average accuracy of 90%. Further, our results show that colorimetry can identify heat treatment in silcrete without knowing geochemical provenience, which is important for analyzing archaeological assemblages. Our study suggests that colorimetry is a promising new approach to studying heat treatment.

Murray, John [40] see Hansen, Nicolas

**Murtha, Timothy (University of Florida) and Whittaker Schroder (University of Florida)**

[181]

*Land Systems Architecture and Ecology as Infrastructure in Cities and Regions across the Maya Lowlands*

Relying on the lens of ecological urbanism this paper describes the diversity of long-term patterns of urbanization and agricultural intensification on regional landscapes in the Maya lowlands of southern Mexico and Central America. Best described as a mosaic, the Maya lowlands offers an important landscape narrative about how food and food systems were integral elements of urban systems across the Maya lowlands over centuries. To discuss the relationships between food systems and urban landscapes, we first discuss the landscape and settlement patterns in the Central Petén, specifically the Tikal region. Second, we scale up to describe the early results of a collaborative research project that is investigating these patterns across the entire geography of the Maya lowlands through a comparative inventory and analysis of lidar transects extending from the states of Chiapas north to Yucatán and Quintana Roo. These data offer a uniquely expansive survey of anthropogenic landscape modification and land use resilience across the region. This information challenges traditional perspectives of urban, peri-urban, and rural, while offering a critical narrative of landscape, food systems, and community resilience in the context of modern land use change and pressures across the diverse ecology of the lowlands.

Murungi, May [151] see Val, Aurore

**Musch, Abigail (American Museum of Natural History) and Anna Semon (American Museum of Natural History)**

[8]

*Unprecedented Times Lead to New Internship Strategies*

In response to the COVID-19 pandemic, the North American Archaeology Lab at the American Museum of Natural History transitioned a long running internship program to a remote micro-internship. We had to consider if offering a remote internship was feasible, what it would require on our end, what projects could be done remotely, what the interns would get out of it, and what type of remote schedule would work. This poster provides a summary of the tools utilized, onboarding process, workflow, and projects completed. Overall, we think our remote internships were a great success because we were able to still offer students opportunities to gain experience in archaeology and move our projects forward even without lab access. In addition, we see the remote micro-internship as an opportunity to diversify our internship program to include students who cannot relocate for financial or other reasons to New York City.

Myagmar, Erdene [93] see Vlok, Melandri

Nagaoka, Lissa [96] see Neme, Gustavo

Nagaoka, Takuya [83] see Ono, Rintaro

Najjar, Mohammad [168] see Howland, Matthew

**Nakatsuka, Nathan (Harvard Medical School), Vera Tiesler (Universidad Autónoma de Yucatán), Jakob Sedig (Harvard Medical School) and David Reich (Harvard Medical School)**

[55]

*Ancient DNA from Campeche, Mexico, Reveals a Socially Segregated Population in the First Two Centuries after Hispanic Contact*

The colonial period in Mexico was an unprecedented time when previously disparate populations began living together under Hispanic leadership and Catholic faith, often unwillingly. Immediately after the conquest, Spanish colonists established urban strongholds, often bringing African slaves and servants with them. In these settlements, Native, European, and African populations encountered each other intensively for the first time. We present ancient DNA data from 10 individuals from the multiethnic cemetery of the central plaza of Campeche, Mexico, which was in use between 1540 and 1680. In conjunction with archaeological, biomorphological, and isotopic data, the ancient DNA data provides crucial details about the collective life history of early colonial Campeche. Although buried together in the same churchyard, the insights into the affinities and lives of the deceased reveal a high degree of social segregation, as reflected in a lack of mixing among the studied Native, European, and African individuals. This suggests that mixing across continental groups may not have been as ubiquitous within early colonial Spanish strongholds as has often been assumed, and that it became more common only later in time.

Nakatsuka, Nathan [55] see Nores, Rodrigo

**Napolitano, Matthew (University of Oregon), Scott Fitzpatrick (University of Oregon), Geoffrey Clark (Australian National University), Amy Gusick (Natural History Museum of Los Angeles County) and Esther Mietes (D7 Archeologie)**

[83]

*Chronological Modeling of Early Settlement on Yap, Western Micronesia*

The initial human settlement of Yap, a group of four small islands in western Micronesia, is one of the least understood colonization



events in Remote Oceania. Unlike Polynesia, where multiple lines of evidence such as linguistics, genetics, and material culture analyses coalesce around a coherent narrative of initial colonization, these same lines of evidence have resulted in major discrepancies that place colonization between 3,300 and 2,200 years ago with a possible homeland originating from somewhere in Island Southeast Asia or New Guinea and/or the Bismarck Archipelago as Lapita culture was developing. A clear understanding of Yap's early settlement has been hampered by a lack of systematic archaeological fieldwork and limited geomorphological reconstruction, making it difficult to model where early sites may have been located. Here we present results of systematic subsurface survey, excavation, preliminary paleoenvironmental and geomorphological reconstructions, and more than 30 new cultural and noncultural radiocarbon dates that shed new light on evidence for the earliest known settlement in Yap.

[83]

Chair

Napolitano, Matthew [130] see Hanna, Jonathan

**Napora, Katharine (University of Georgia), Victor Thompson (University of Georgia), Alexander Cherkinsky (University of Georgia), Robert Horan (Georgia Department of Natural Resources) and Craig Jacobs (Georgia Department of Natural Resources)**

[68]

*Insights into Paleoenvironment and Cultural Resilience on the Ancient Georgia Coast and Implications for Sustainability in the Twenty-First Century*

We discuss key insights into over 5,000 years of environmental change on the Georgia Coast derived from tree-ring analyses of a deposit of ancient bald cypress from the mouth of the Altamaha River, including changes in coastal forests through time. Human-environment interactions, such as the resilience of estuarine-based societies and ecosystems during periods of major instability, are illuminated via this annual data source. We consider some of the implications for twenty-first-century coastal management and sustainability in light of this information.

Nara, Takashi [72] see Sato, Takao

Narasimhan, Vagheesh [37] see Sedig, Jakob

**Nash, Carole (Geographic Science, James Madison University)**

[35]

*Prioritizing What We Don't Know: Climate Change as a Catalyst for Upland Survey*

The upland forests of the Appalachians are among the most diverse natural communities in the temperate world, providing the setting for a study of change and flexibility as an essential feature of existence, both for precontact and historic cultures. However, upland archaeology has lagged due to the long-held belief that upland sites have limited signatures and are thereby less likely to provide significant information on cultural processes. Currently, archaeological sites here are compromised by climate change processes such as drought and high winds that create conditions for frequent wildfires, as well as extreme precipitation events that led to severe erosion, flash flooding, or rapid mass wasting. The lack of research makes it difficult for decision makers to develop prioritization plans in the face such threats. A GIS-based analysis of settings that are most likely be impacted by catastrophic climate-related events, coupled with archaeological models of precontact site locations, provides a process for identifying areas in the greatest need of survey. Such work is being carried out in Shenandoah National Park, where archaeologists ground-truth the geospatial analysis to further refine decision making for future work.

[35]

Chair

**Nash, Carole (Geographic Science, James Madison University)**

[113]

Discussant

**Nassaney, Michael (Western Michigan University)**

[60]

Moderator

**Navarro-Farr, Olivia (College of Wooster), Mary Kate Kelly (Tulane University) and David Freidel (Washington University in St. Louis)**

[76]

*Snake Queens and Political Consolidation: How Royal Women Helped Create Kaanul—A View from Waka'*

Our paper demonstrates the key role played by royal women of the Kaanul realm in fortifying and consolidating that realm's power and hegemony in the seventh to eighth centuries CE. We draw upon archaeological, visual, and textual evidence from Waka', including preliminary analysis of recently discovered Stela 51, and elsewhere across the realm. We address how the political actions of royal women served to consolidate the Kaanul realm, helping to create the so-called Golden Age of their Late Classic supremacy. These women anchored themselves materially and symbolically within the landscapes they ruled and established enduring bonds through blood and political maneuvering. In our view, these northerly women, and their contributions in this political consolidation work, have been under-examined. Embracing a feminist perspective, we seek to rectify that imbalance in scholarship. The

implications of our findings are important not only for a more nuanced understanding of Late Classic political history but also have enduring significance for Indigenous women in the Americas today.

Navarro-Farr, Olivia [12] see Henson, Devin

**Navas, Ana (University of Texas, Austin)**

[171]

*Compositional and Technological Analysis of Panamanian Colonial Utilitarian Wares*

In Panama, as in other regions of the Caribbean and Latin America, several archaeologists have reported the presence of colonial utilitarian wares, also known as Colono-Indian ware, creole ware, and coarse hand-made earthenware. Previous research on this ware focuses on refining the typologies and identifying traits that could be related to African, Spanish, and Indigenous traditions. Inspired on recent research that approach production and consumption of colonial technologies as contextually constructed, I study the configuration of new communities of practice for the production of pottery in colonial Panama. Compositional and technological analysis through neutron activation and petrographic methods of 192 sherds from Central and Eastern Panama inform the recipes and techniques used for ceramic production during the precolumbian and colonial periods. This study provides new data to address the production and consumption of Panamanian utilitarian wares beyond the identification of identity and definition of typologies. The research gives new insights to understand the contribution of non-Europeans to the construction of colonial Panama.

**Nebbia, Marco**

[92]

*Trypillia Mega-site Networks: Understanding the Centrality of the Largest Settlement in Fourth-Millennium BC Europe*

The emergence of the largest settlements in fourth-millennium BC Europe triggered a number of questions regarding their proto- or even "fully urban" nature. For a long time scholars have been debating on this matter, focusing attention on the intrasite features of Trypillia mega-sites, thus overseeing the implication of understanding how they originated within a long-term settlement trajectory. This paper will look at the role of the Trypillia settlement network in the development of mega-sites as poly-nodes of mid-scale regional site clusters as well as "central places" of a supra-regional settlement system. First and second order characteristics of point pattern analysis are investigated in order to propose a way of measuring the centrality of these mega-sites within their coeval settlement network, as well as understanding the scale of their hinterlands. Concepts like seasonality and heterarchy are used to explain the development and the social organization of mega-sites, which are conceived as temporary gathering places where an "urban-like" identity starts to develop. The relational nature of the proposed approach could facilitate its applicability to other regional contexts which would allow for a more formal cross-regional comparison of long-term settlement trajectories.

[92]

Chair

Negrino, Fabio [28] see Brun, Catherine

Negrino, Fabio [40] see Keller, Hannah

**Neller, Angela (Wanapum Heritage Center, Grant County PUD)**

[110]

Discussant

**Nelson, Elizabeth, Evelyn Guevara (University of Helsinki), J. Marla Toyne (University of Central Florida), Johannes Krause (Max Planck Institute) and Kirsten Bos (Max Planck Institute)**

[182]

*Precolumbian Tuberculosis in the Chachapoya from the Northeastern Peruvian Andes*

The application of molecular methods to paleopathology has revealed a strain of tuberculosis (TB) closely related to a variety currently adapted to seals and sea lions that caused human infection in the western Andes of prehispanic South America. Our understanding of ancient TB distribution in terms of geography and genetic diversity is, however, limited since genome-level evaluations have thus far been restricted to only a small number of individuals of the western Andean region. Here we present a reconstructed ancient TB genome from the eastern Andean slopes recovered from the Chachapoya funerary site Diablo Huasi, located in Amazonas, Peru. Because this skeleton displayed pathological changes that were non-specific in lesion distribution and morphology, we employed a broad pathogen screening method with limited ascertainment bias. TB was the only pathogen detected, and its preservation permitted the subsequent reconstruction of a 10-fold TB genome. Our phylogenetic analysis reveals that the Diablo Huasi TB strain is closely related to those from the neighboring ancient coastal and highland populations. Our results demonstrate the utility of molecular methods for paleopathological analyses and expand the known geographic range of ancient TB strains thus providing insight into their local ecology and evolution.

**Neme, Gustavo (IDEVEA/CONICET/UTN), Lissa Nagaoka (University of North Texas), Adolfo Gil (IDEVEA/CONICET/UTN) and Eva Peralta (IDEVEA/CONICET/UTN)**

[96]

*Spatial Pattern of  $\delta^{18}\text{O}$  Water Isotope in the Argentinean Central West: Their Potential to Model Human Mobility at Archaeological Scale*

This paper presents the  $\delta^{18}\text{O}$  isotopes results based on a new southern Mendoza water sampling. Using GIS the  $\delta^{18}\text{O}$  isotope information from water sources is modeled in regional isoscapes. With this baseline we discuss human mobility, analyzing three

archaeological cases. In total 92 water source samples from rivers, creeks, springs, snow, lagoons, and water holes, places among 3,200 and 400 m asl were analyzed. All of this data are discussed together with 158 human bone samples from hydroxyapatite from southern Mendoza archaeological sites between 34° and 37° SL. The results indicate a strong correspondence between  $\delta^{18}\text{O}$  water areas with  $\delta^{18}\text{O}$  human samples. Also, some of the results suggest changes in the mobility pattern through time.

Neme, Gustavo [175] see Morgan, Christopher

Nesbitt, Jason [15] see Johnson, Rachel

Neumann, Frank [151] see Val, Aurore

**Neurath, Johannes (INAH)**

**[180]**

*Discussant*

Neves, Eduardo [87] see Pugliese, Francisco

**Newlander, Khori (Kutztown University) and Laura Zacharias (Kutztown University)**

**[77]**

*Intra-source Variability and Lithic Sourcing in East-Central Pennsylvania*

In eastern Pennsylvania, archaeologists have long used patterns of toolstone conveyance to define vast territories or trade networks that stretch across much of the Middle Atlantic. For example, the Late Archaic-Early Woodland lithic assemblage from the "KU Site" in east-central Pennsylvania purportedly includes artifacts made from Onondaga chert (New York) and Flint Ridge chert (Ohio). These source attributions are problematic, however, because they are based solely on the analysis of macroscopic attributes absent any consideration of the toolstone available from local sources. Here, we test these source attributions by comparing the supposedly nonlocal chert artifacts with toolstone available in the Lyons Quarry, located only a few miles southeast of the KU Site. Our study demonstrates the necessity of determining the intra-source variability that exists in chert quarries closer to hand as an important step toward confidently sourcing chert artifacts and interpreting their conveyance.

Newman, Richard [133] see Kaplan, Emily

Newman, Richard [133] see Katz, Monica

Newsom, Bonnie [35] see Kelley, Alice

Nguyen, Ai Du [83] see Weisler, Marshall

**Ni, Jenny (Columbia University)**

**[145]**

*Situating Northern Rio Grande Horse Petroglyphs in the Plains Biographic Tradition*

Survey in the Rio Grande Gorge of New Mexico over the past decade has revealed a robust corpus of rock art that depicts horses in the Plains Biographic tradition. Comparison of the Rio Grande Gorge horses to horses in Plains Biographic rock art of other regions and cultures may address questions of cultural affiliation, movement of people, the transmission of horses in the Plains region, and the story of encounter between Indigenous peoples and horses. This paper analyzes the variety of horse depictions from the Rio Grande Gorge and explores how they relate to the wider Plains Biographic tradition.

**Nichols, Deborah (Dartmouth College)**

**[60]**

*Discussant*

**Nichols, Deborah (Dartmouth College), L. G. Gorenflo (Penn State) and Ian Robertson (ASU)**

**[104]**

*Basin of Mexico: Prehispanic Population History*

The Basin of Mexico Survey and the Teotihuacan Mapping Project were landmark projects in the history of archaeology. One goal of both projects was reconstructing prehispanic population history to improve our understanding of cultural evolution in this region. The population histories and estimates generated for the great city of Teotihuacan and the basin as a whole significantly changed our understanding of prehispanic Mesoamerica. The abandonment of many rural settlements in the Basin of Mexico at the time of Teotihuacan's dramatic growth in the first century AD had been unknown, as had the impact of the city's collapse on regional settlement and demographics, the geographic influence of Tula on Basin settlement, and the rapid growth of Aztec population. But those demographic reconstructions warrant revisiting. In this paper we discuss several factors that complicate demographic reconstruction in the basin and at Teotihuacan, including challenges of surveying multicomponent sites, the need for refined ceramic

chronology, difficulties in linking urban and rural demographics, limitations on surface visibility of sites due to the effects of erosion and deposition, effects of varying land use on surface remains, and the general challenge of establishing contemporaneity within and among sites.

**Nichols, Deborah (Dartmouth College)**

**[136]**

*Discussant*

**Nicholson, Christopher (Center for Digital Antiquity), Jessica Irwin (Center for Digital Antiquity) and Rachael Fernandez (Center for Digital Antiquity)**

**[49]**

*Stop, Collaborate, and Listen: Steps toward Data Interoperability and Reuse across Archaeological Disciplines and Professions*

Archaeological data collected by CRM firms and academics are rarely interoperable, making it difficult to reuse information. Though most archaeological datasets produced are the result of compliance work, they are rarely used outside of the specific project for which they were created and are rarely archived or shared. Thus, billions of dollars spent to generate data see only a fraction of their potential return on investment. Furthermore, the data that are made available for reuse are so project specific that they are not interoperable with similar thematic data. As the volume of data produced increases, integrating datasets will become more challenging and combining data from broader spatial-temporal extents into unified datasets near impossible. However, with collective will, archaeologists can enact the FAIR principles by creating large-scale databases with consistent ontologies, housed in secure, publicly available data repositories. For archaeology to keep pace with other scientific fields in the twenty-first century, I argue that that as a discipline, dynamic datasets must be advocated for, built, populated, updated, maintained, and made accessible to a variety of stakeholders and digital platforms. This is achievable and will necessitate a coordinated effort to work toward common data collection and use goals, regardless of affiliation.

**Nicodemus, Amy (University of Wisconsin, La Crosse)**

**[129]**

*Animal Economies and Emergent Complexity in the European Bronze Age*

The Bronze Age is marked by dramatic social changes throughout much of the Old World. In Eastern Europe, and elsewhere, we see the emergence of regional hierarchies characterized by political and economic centralization and heightened status differentiation. While focus traditionally has been placed on the manufacture and exchange of metals, significant changes in livestock management systems can also be seen at this time. At central settlements, such as Pecica-Șanțul Mare (Romania), animal husbandry shifts from employing risk-buffering to resource-maximizing strategies, intensifying the production of high-value animals and their products. This, in part, reflects the desire to increase exportable commodities. Other changes are responses to local elite demands for high-quality meat, including the implementation of provisioning systems and ritualized feasting. Restructuring of animal production and consumption practices is tightly integrated within, and central to, broader economic changes that lay the foundation for complex polities in the European Bronze Age.

**Nicolas Lorenzo, Dennis (University of Yamagata)**

**[47]**

*Interacción y cambio social en los medios de circulación del período Formativo Medio y Tardío en la zona altoandina de Lambayeque, Norte del Perú*

Investigaciones sobre el cambio social entre el Período Formativo Medio y Tardío de los Andes Centrales tienen identificado diversos estímulos (sociales, climáticos e ideológicos) como causante de dicha realidad. Sin embargo, durante la última década una creciente acumulación de datos de diversas regiones ha configurado el rol activo de las interacciones sociales y la circulación de cierto tipo de productos a larga distancia como uno de los principales motivos de cambio. Generalmente se asume que dicho cambio está asociado con la emergencia de la desigualdad social y el acceso al poder. Esta presentación, desde el punto de vista de la arqueología internodal (Nielsen 2006) y una visión macro-morfológica de los medios de circulación (Trombold 1991) en la zona altoandina de Lambayeque, una región ubicada en la zona de transición entre la costa norte y la vertiente oriental en el norte peruano, muestra, como la intensidad y frecuencia de las interacciones sociales de carácter interregional motivaron el cambio social asociados a los medios de circulación. Se considera de manera hipotética que este cambio también incluye la consolidación de comunidades de acceso y el uso de los camélidos en la interacción social.

**Nicolay, Scott (University of California, Merced) and Margaret Berrier (Jornada Research Institute)**

**[158]**

*"Tlaloc" and "Chicomoztoc" in the North: Evidence for Chthonic Concepts from Mesoamerican Cosmovision in the Caves of the Greater Southwest*

Claims for contact between Mesoamerica and the US Southwest predate by centuries the inception of archaeology as a scientific discipline. However, despite such long-standing assumptions and the accumulation of evidence from the archaeological record, including ball courts, copper crotals, cacao, and macaws, as well as material manifestations of Mesoamerican ideologies, the timelines, sources, and mechanisms for these transmissions remain elusive. One of the most dramatic (if controversial) indicators for long-distance contact is the presence of the Mesoamerican storm god known in Nahuatl as Tlaloc in hundreds of images in rock art from New Mexico, Texas, Chihuahua, and Sonora, as well as on portable objects, including ceramics and painted effigies from at least five caves. Two other southwestern caves, both among the most important cave shrines in the region and at least one of which has been culturally modified, present unusual morphologies suggesting that they may have functioned as representations of Chicomoztoc, the Nahua "seven caves" of emergence. This paper presents new findings for both concepts and reconsiders their presence in the Southwest as well as the timing of their arrivals, suggesting that while Tlaloc may have arrived centuries earlier than

previously recognized, the Chicomoztoc model may be even older there.

**Nielsen, Jesper (University of Copenhagen) and Christophe Helmke (University of Copenhagen)**

[101]

*Years to Remember: Another Look at Teotihuacan's Calendrical Signs*

We offer a new look at a series of carved monuments and examples of rock art from Classic Teotihuacan culture (ca. AD 100–500) of highland central Mexico, all of which bear single calendrical dates in the 260-day calendar. Monuments such as those of Cerro Xocconoch and the Plaza de las Columnas serve as records of particular years, in the Teotihuacan year-bearer system. While the events that transpired on these dates remain unknown, a comparison with the Epiclassic and Late Postclassic cultures of central Mexico indicate that they could have served to memorialize accessions, the dedication of buildings, or other important state-level events. We find ample evidence for an analogous tradition, that of Mexica, which is distinguished for its preference for recording and celebrating specific years in sculpture, as well as in rock art. In addition to the historical events cued by isolated year dates, we also examine evidence of ritual activities centered on the representations of other calendrical dates. We conclude by suggesting that the famous Zapotec “stela” from Teotihuacan’s Oaxaca barrio conforms to an adaptation of the predominant Teotihuacan tradition.

**Nieto Hernandez, Rubén (Universidad Autonoma del Estado de Mexico) and Yoko Sugiura (El Colegio Mexiquense A.C.)**

[71]

*Los caminos de la Sierra de las Cruces: Reflexiones sobre el significado del paisaje en la comunicación interregional*

El sistema montañoso que divide a la cuenca de México y el valle de Toluca, conocido como la sierra de las Cruces, constituyó, desde tiempos remotos, una región clave por la que ocurrieron desplazamientos poblacionales que iniciaron desde hace al menos tres mil años y se mantuvieron en funcionamiento hasta mediados del pasado siglo XX. La naturaleza misma de la región le confiere características determinadas no sólo por su configuración topográfica, influyó también en su papel como vía de paso y en la relación que los pueblos establecieron con el paisaje. El trabajo aquí presentado explica que la región funcionó no sólo como zona de paso o como delimitador regional. Representó además un escenario adecuado para poblaciones que la habitaron a través del tiempo, quienes adquirieron un conocimiento profundo del entorno y sus recursos. A su vez, la creación y operación de caminos representó una de las estrategias para estructurar el paisaje que involucró la elección de los lugares preferenciales donde habrían de construirse los asentamientos humanos. Desde el preciso momento en que se pusieron en funcionamiento las rutas, se facilitó la movilidad de grupos, acompañados de ideas, prácticas culturales, comerciales, en síntesis, de una compleja interacción social.

**Nigh, Ronald**

[71]

*The Contested Mosaic: Landscape and Livelihood in the Lacandon Rainforest*

In this paper I explore the complex regional agroecological history of interaction of global and local social and biophysical forces that shape the landscape of an important tropical forest region of Mexico. This research contributes to the effort to improve our understanding of the determinants of land-use and land-cover change by focusing on the tensions between local collective-action goals and higher-level—regional, national, and global—institutions. The Lacandon Rainforest of Chiapas is the largest piece of tropical evergreen forest remaining in North America and, as such, contains an important proportion of Mexico’s biodiversity. The forest has been disturbed by extensive cattle production and extensive agrarian colonization by Maya people from surrounding regions during the twentieth century. In the twenty-first century the principal threat to the forest has been the expansion of oil palm plantations for biofuels and the promotion of industrial ecotourism. The conservation of this forest cover and the restoration of extensive degraded areas in this region, the result of misguided development policies, could have a significant impact on large-scale processes of environmental change during the current century.

Nikitina, Daria [35] see Wholey, Heather

**Niquette, Richard (University of Kansas), Bryon Schroeder (Center for Big Bend Studies of Sul Ross) and Rolfe Mandel (Kansas Geological Survey)**

[6]

*Preliminary Results of Geoarchaeological Investigations at the San Esteban Rockshelter (41PS20), Southwest Texas*

The San Esteban Rockshelter is located in the Alamito Creek drainage of the Big Bend region, southwest Texas. The site is associated with a perennial tinaja, which made it an attractive location for human occupation in this arid region for at least the past 10,000 years. The shelter has been subject to undocumented collecting since the early 1900s, yet preliminary testing in 2000 revealed intact cultural deposits. In the summers of 2019 and 2020, the University of Kansas Odyssey Research Program launched a geoarchaeological investigation to determine the extent and age of sedimentary and cultural deposits in the shelter. Despite the magnitude of previous disturbances, the study revealed extensive intact cultural deposits dating from the late Holocene through the historic period. In addition, potential for older intact deposits is indicated by the recovery of mid-Holocene hafted bifaces retrieved from backfill. This poster presents the preliminary results of the 2019 and 2020 investigations. Continued research at San Esteban will address many questions of past lifeways in southwest Texas.

**Nishimura, Yoko (Gettysburg College)**

[141]

*Energizing Museum “Diaspora” Collections for Archaeological Research: A Case Study from Jōmon-Period Japan*

This paper offers a heuristic tool to generate archaeological research questions that address the sociocultural lives of ancient people utilizing the strength of existing museum collections. Methodologically, it is necessary to select artifacts that are diagnostic on

surface appearance and that can be linked, as a “diaspora” collection, to the “original” dataset in their homeland. Diaspora artifacts are those that were unearthed in a homeland site that is far away from the museums where they are currently stored. Once the diaspora collection is embedded within its homeland dataset, this facilitates development of meaningful research questions and leads to solid archaeological research despite the lack of detailed excavation information. A case study to exemplify this approach is drawn from Jōmon-period pottery data originally excavated near Tokyo and currently stored in the University of Pennsylvania Museum of Archaeology and Anthropology, Philadelphia as well as in the Tokyo National Museum, Japan. This methodology leads to a conclusion that certain types of special pots in Late Jōmon were used as containers for botanical insect repellent and indoor fragrance.

**Nissen, Zachary (Northwestern University)**

**[152]**

*Inequality, Urban Longevity, and Commoner Households at the Ancient Maya City of Aventura, Belize*

Archaeological studies of urbanism frequently seek to assess the factors which enable some cities to persist over the long-term while others fail after a few generations. This paper continues this line of inquiry by drawing on anthropological scholarship on inequality to examine the relationship between socioeconomic inequality and urban longevity. The paper utilizes settlement survey and excavation data from commoner households at the ancient Maya city of Aventura, Belize as a case study to further examine this relationship. Aventura provides an ideal case to assess the relationship between inequality and urban longevity because of its long-term urban occupation and the persistence of its heterogeneous population during the Terminal Classic to Early Postclassic transition (750–1100 CE), a period of regional stress. By focusing on commoner households, this paper will consider the overall impact this period of stress had on lower-end households and reflect on the broader social and economic processes that enabled Aventura’s urban community to persist while others did not.

Niven, Laura [33] see Lagle, Susan

**Noe, Sarah**

**[54]**

*Change, Continuity and Foodways: Indigenous Diet at Mission Santa Clara (1777–1836)*

This paper examines mission documents, agricultural production reports, and faunal remains recovered from three middens situated alongside the Native American barracks at the Spanish mission site of Santa Clara (1777–1836). Mission Santa Clara housed a diverse population of differing Native American groups including predominantly Ohlone speakers, as well as Yokuts-speaking people, and later in time Miwok individuals. The integration of analyses of faunal remains and mission records will be used to assess changes and continuity in foodways throughout the mission period. The adoption and/or rejection of specific foods represent choices made as cultural and economic traditions were both maintained and modified within the constraints of mission life. Foodway practices will therefore be used to better understand indigenous autonomy within this colonial context.

**Nolan, Kevin (AAL, Ball State University) and Charles Bello (Federal Emergency Management Agency)**

**[109]**

*Collaborative and Community Archaeology: Introduction and Some Case Studies*

Collaborative and Community Engaged Scholarship (CES) continues to be an important topic in our profession, encompassing a growing diversity of activities. This session displays a commitment to the concept of conducting research and historic preservation in effective partnership with a wide spectrum of 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.

**[109]**

*Chair*

Nordness, Ryan [49] see Mauck, Jessica

**Nores, Rodrigo (Instituto de Antropología de Córdoba [CONICET/UNC], Argentina), Nathan Nakatsuka (Harvard Medical School), Pierre Luisi (UNC, Argentina), Josefina Motti (NEIPHA [UNICEN], CONICET, Argentina) and David Reich (Harvard Medical School)**

**[55]**

*Genetic Change in South Patagonia over Seven Millennia*

South Patagonia, the austral extreme of South America, has been inhabited for at least 12,600 years. Following European contact, five ethnic groups of hunter-gatherers (Yámana, Kawéskar, Selk’nam, Haush, and Aónikenk) were documented. They based their subsistence on two broad strategies optimized for maritime or terrestrial resources. After a century of fieldwork, archaeologists have revealed a complex pattern of differentiation between groups. Many questions regarding peopling, admixture and technological changes remain to be answered. In order to provide some hints into these questions, we generated genome-wide data from 20

ancient individuals and compared it to previously reported data. We observed a shared genetic ancestry between maritime and terrestrial Middle Holocene individuals (~6600–5800 BP) that persists in some Late Holocene groups. We also identified two migration events that reached South Patagonia: a first wave by at least ~4700 BP that differentiated Late Holocene maritime groups from terrestrial ones, and gene flow with Central Chile around 2000 BP, which impacted both terrestrial and maritime groups. Finally, Late Holocene groups fall on a genetic cline precisely correlated to geographic ordering following the coastal line, as a result of the uneven impact of these two migration processes.

Noriega, Aldo [128] see Conlee, Christina

Norman, Lauren [179] see Alix, Claire

Notelid, Michel [124] see Ekblom, Anneli

**Nowak, Jesse (University of Oklahoma)**

[51]

*Living Symbols from a Mythic Landscape: An Exegesis of the Apalachee Ballgame Story and Place-Making in Northwest Florida*  
Dr. Kent F. Reilly and many of the scholars associated with the Mississippian Iconography Workshop have used ethnography and folklore to support interpretations about ritual and cosmology. This paper discusses how ancient landscapes can, in turn, inform folklore, ritual communication, and iconography. Expanding on previous scholarship that explored the connections between the Apalachee Ballgame myth and iconography recovered from the Lake Jackson site in Northwest Florida, I argue that the ancient landscape of the Tallahassee region was encoded in the ballgame myth and that these places participated in the creation of meaning for symbolic imagery.

**Nowak, Jesse (University of Oklahoma)**

[120]

*Chair*

Nowak, Jesse [120] see Deere, Bobi

Nowell, April [151] see Collins, Benjamin

**Nuckols-Wilde, Catherine (Tulane University)**

[101]

*A Return to Roots: The Maya—Teotihuacan Inscription at Copan's Temple 26*

In the mid-eighth century, Copan's fifteenth ruler, K'ahk' Yipyaj Chan K'awiil, oversaw the completion of Structure 10L-26 (or Temple 26), which was crowned with a stone inscription located within the superstructure. This inscription features a parallel display of Maya full-figure glyphs alongside Teotihuacan-inspired graphics. The style of the inscription is unique in the corpus of Maya texts and is distinct even from the script found on the hieroglyphic stairway leading down from it. Although not yet fully deciphered, initial analyses suggest that the contents of each column mirror each other. In this paper, I analyze the Temple 26 inscription as a tool that draws a parallel between Copan's dynastic founder, K'inich Yax K'uk' Mo', and its twelfth ruler, K'ahk' Uti' Witz K'awiil. Using iconographic and epigraphic approaches, I investigate potential classifications for this inscription (as a biscript, font, etc.) that could lead to a clearer interpretation of its meaning. Finally, I propose that this text embodies an invocation of Copan's dynastic roots in the face of political turmoil, as well as a "hearkening back" to the city's connection to the powerful city of Teotihuacan, at this point long abandoned.

[101]

*Chair*

**Núñez Cortés, Yajaira**

[178]

*Economy, Exchange, and Power at Lomas Entierros, Central Pacific Costa Rica*

Lomas Entierros is a primary center in Central Pacific Costa Rica, characterized by the presence of monumental architecture on top of a defensible hill, and the circulation of important amounts of imported ceramics. The architectural system combined elevated half-moon terraces with cobblestone walls, foundations, slopes with retaining walls, and more humble structures at the periphery partially built with cobblestones and clay floors and walls. In this presentation, I analyze domestic assemblages, in combination with location within the site, and house architecture to characterize manifestations of wealth, power, and material culture usage. The results inform about social and political complexity, domestic and community economy, and occupational differentiation. I argue that elite power was fueled by a combination of factors, including deep and long occupations, control over the entry and internal movement of imported objects, surplus lithic production, and the use and display of locally valuable objects and symbols of power. Valuable local and imported ceramics were not restricted to elites, which demonstrates the complexity of economic and social relationships at the site. The results indicate that intermediate and low status members of the community were relatively independent crafters and gained access to exchanged objects through means that differed from top-down control.

[178]

*Chair*

Núñez Cortés, Yajaira [132] see Corrales-Ulloa, Francisco

O'Brien, Kaedan [177] see Freiwald, Carolyn

O'Shea, Colleen [128] see Gómez, Juliana

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

**[156]**

*Relating to and through Food: Thinking about the Social Dimensions of Food through Cuisine and Commensality*

The fundamental importance of food to mind, body, and society makes foodways important to our understanding of past social phenomenon. In this presentation, I highlight the importance of engaging with the social dimensions of food to address the multifaceted relationships between broader changes in the environment and political economy and the everyday practicalities and uncertainties that shaped food practices in the past. I approach the social dynamics of past foodways through the dual lens of cuisine, the cultural logics and embodied traditions of food practices, and commensality, the socioeconomic and political dynamics of shared meals. I discuss the opportunities and challenges of addressing cuisine and commensality in the past through a combination of legacy data, museum collections, ethnoarchaeological research, and the perspectives of descendant communities. Drawing on research examining the role of foodways in rapid social transformations in the Cibola/Zuni region of New Mexico, I emphasize the value of foodways in "thinking" about past lifeways, and argue that synthetic analyses of past foodways drawing on multiple material and theoretical perspectives provide a unique window into the ways individuals along multiple intersections of identity were (un)able to experience and participate in broader social and political life through food.

**Oberheim, Paul (University of Wyoming), Richard Boisvert (Former State Archaeologist of New Hampshire) and Mark Doperalski (State Archaeologist of New Hampshire)**

**[27]**

*Supporting Paleoindian Viewsheds with the Jefferson VII Site, Jefferson, New Hampshire*

Viewsheds provide an integral part in understanding the first peoples inhabiting the early Northeastern landscape. Work conducted by Dr. Richard Boisvert and others have established a way of analyzing the paleo landscape by looking at the vantage point of different settlements excavated in New Hampshire. I intend to add to this list by examining the Jefferson VII site, a hunter's lookout close to the surrounding sites Boisvert has investigated. In addition to the Jefferson VII site I will be comparing other sites across the landscapes to the recently proposed model and against Jefferson VII. In this way I hope to provide a clear sampling between the different datasets of similar sites while providing a number of adequate control sites where the testing has already been done. With this information I hope to increase the amount of data available on paleo overlook points so that the same methods can be used on other sites to better map the Pleistocene pathways that helped people the region.

Oberlies, Nicholas [133] see Cank, Kristof

**Obermeyer, Brice (Delaware Tribe) and Susan Bachor (Delaware Tribe Historic Preservation Office)**

**[109]**

*Collaborative Survey of Delaware Cultural Sites in Northeastern Oklahoma*

In 2019, the Delaware Tribal Historic Preservation Office (DTHPO) partnered with East Stroudsburg University (ESU) to conduct noninvasive surveys of seven significant cultural and religious sites in Oklahoma. With support from the National Park Service (NPS), the DTHPO-led survey utilized ESU equipment and training to conduct the survey with support from tribal members and ESU students who worked collaboratively in the field. Tribal members shared community knowledge that helped to guide the surveys, and both tribal members, DTHPO staff, and ESU students gained hands-on experience with survey techniques. As the identified sites were highly sensitive, noninvasive methods were used that included ground penetrating radar (GPR), Global Positioning System (GPS), physical measurement, historical records search, and elder interviews. The results from the survey will now be used to guide the DTHPO in the management, protection, and preservation of these significant Delaware heritage sites. The surveyed sites and the distinctive cultural practices performed at each are threatened by urbanization, a break in cultural knowledge, and an aging population. Recordation will ensure that future generations will have the institutional knowledge to preserve and protect our culture.

Obermeyer, Brice [109] see Thompson, Christine

**O'Brien, Haley (University of Montana)**

**[33]**

*Human vs. Nonhuman Bone: A Nondestructive Histological Instrument*

Species identification is one of the first steps in the analysis of bone fragments in archaeological and bioarchaeological contexts. Current methods for taxa identification include morphoscopic, histological, and DNA analyses in order to assess what is present in an assemblage for zooarchaeological research, forensic significance, and NAGPRA considerations. This preliminary study uses an MA1000 AmScope camera microscope to examine the longitudinally fractured surface of cortical bone fragments to gauge if taxa identification is possible from fragmentary remains without morphologically identifying features. This technique is testing for a notable difference in human vs. bovid vs. cervid cortical bone cortices without the use of destructive histological or DNA analyses. The results of the study show there is a statistically significant association with positive bone identification between taxa, an



accuracy measure of 65.6% for all taxonomic groups, 96.2% accuracy of identifying human bone correctly, and 7.9% misidentification of nonhuman bone as human. Future dissertation research will include more taxa, field portable DinoLite, and rigorous reliability and validity frameworks to test the accuracy and consistency of results. This instrument has promise as a teachable resource for archaeologists, bioarchaeologists, and forensic scientists alike based on the diverse backgrounds of blind study participants in this project.

**O'Brien, Michael (Texas A&M–San Antonio)**

**[164]**

*Discussant*

**Ochoa-Winemiller, Virginia (New Jersey City University)**

**[132]**

*Crafting and Trading along the Banks of the Telica: Artisan Communities and Regional Interaction in Eastern Honduras and Beyond*

This paper focuses on the regional role that two artisan communities, Chichicaste and Dos Quebradas, played as producers of pottery and obsidian blades within regional exchange networks. Chichicaste pottery has been recovered from many Honduran sites as well as from El Salvador and northern Nicaragua. The wide distribution of this distinctive pottery is noticeable given that the production locus is a small community vastly devastated by modern human development. Dos Quebradas, a larger site with monumental architecture was a production node for obsidian blades sourced as far as Central Mexico. The location of both communities at the cross-roads of trade routes from Mesoamerica, northwest-central Honduras, and the Isthmo-Colombian-Chibchan regions allowed them to participate in the exchange of international goods and ideas until Postclassic times.

Oczipka, Martin [93] see Piezonka, Henny

Odegaard, Nancy [133] see Bisulca, Christina

O'Donnabhain, Barra [67] see Alonzi, Elise

O'Gorman, Jodie [105] see Painter, Autumn

Ólafsson, Gudmundur [148] see Smith, Kevin

**Oliveira, Diogo (CAIRIM)**

**[124]**

*Cabaceira Pequena Archaeological Site: Initial Data and Interpretations*

The Swahili Coast Civilization was a collection of independent polities that stretched across a large portion of the East African Coast from about 800 CE to the early modern period. There are several important sites that have contributed to our understanding of the wider Swahili world in northern Mozambique. On the Cabo Delgado and Nampula coast, some sites included Swahili settlements such as Angoche, Mozambique Island, the Quirimba Islands, and Somana. There are still important questions yet to be answered regarding the identity and relationships these coastal groups on the Mozambican coast had with the rest of the Swahili world. It is becoming increasingly clear that communities along the Nampula and Cabo Delgado coast had a different historical trajectory compared to their northern contemporaries. A 2018 excavation at Cabaceira Pequena Archaeological Site offers new possibilities for understanding the Swahili cultural horizon. This paper seeks to argue that although the Swahili coast was a cohesive amalgamation of independent polities, at the same time Swahili society was a diverse set of communities that represented a number of different influences from across the Indian Ocean world.

**[124]**

*Chair*

**Olivier, Guilhem (Instituto de Investigaciones Históricas, UNAM) and Vera Tiesler (Universidad Autónoma de Yucatán)**

**[154]**

*Open Chests and Broken Hearts: New Perspectives on Human Heart Sacrifice in Mesoamerica*

Beyond the general idea of benefiting society and placating the divine, the polyvalent symbols and meanings of ancient religious sacrifices can be interpreted properly only after combining different disciplinary lenses. In this paper, we scrutinize iconographic and ethnohistorical testimonies of heart sacrifices together with new forensic evidence from across the Mesoamerican landscape. We focus on three different heart extraction procedures, two of which are characterized for the first time. Each reconstructed method (i.e., from below the chest cavity, between two left ribs, and through the sternal bone) provides novel cues regarding the array of ceremonial devices and native concepts of the human body as a cosmic model. Its partitioning and the liberation of vitalizing matter (namely, the heart and blood) fed specific sacred forces during divine cult and mythic reenactment. As for the Aztecs, we conclude that different trunk opening procedures were practiced as part of ritual sequences that in each case enabled access to the Cosmic Sacred Mountain with its vivifying essences. In this context, native conceptions surrounding the distinctive heart-extraction techniques pose new proxies for analogous sacrificial practices in other parts of the world, still awaiting systematic scrutiny.

Olmo-Enciso, Lauro [149] see Castro-Priego, Manuel

**Olson, Kaelyn**

[9]

*A Statistical Exploration of Differences in Skeletal Element Prevalence Between Primary and Secondary Burials*

Mortuary processes have tremendous political, cultural, and religious meanings. Understanding whether a skeletal assemblage was found as part of a primary or a secondary burial has a significant impact on the interpretation of a site or collection. This project evaluates the statistical significance of differences in skeletal element prevalence between primary and secondary burials, and explores whether the prevalence of certain skeletal elements are more likely than others to be indicative of primary and secondary burials. The data used for this project is a compilation of inventories in published data for archaeological sites in North America, Europe, and the Mediterranean region. Each site or site feature marked as an estimated primary or secondary burial, with additional notes for sites with other processes involving the removal of skeletal elements. These sites were selected for the relative consistency in inventory methods. This dataset was tested for normality and found to be non-parametric, and so was assessed using the Wilcoxon Rank Sum Test and the Kruskal-Wallis Test. Exploratory analysis was also conducted using a correlation matrix and a principal component analysis to gain additional understanding of which skeletal elements, if any, appear to relate to each other or burial type.

Olson, Kaelyn [10] see Porter, Keri

Oncebay, Noemi [128] see Gómez, Juliana

**O'Neil, Megan (Emory University)**

[180]

*Surface, Texture, and Touch in Ancient Maya Art*

Examining multiple media, this paper addresses depicted and actual surfaces in ancient Maya art in order to explore artistic engagements with surface, texture, and the sense of touch. It considers, for example, how certain artists rendered bodies, objects, and materials in manners conveying the look and feel of surfaces, both to convey information about the material characteristics of depicted things and to evoke tactile or haptic experiences for viewers and users. For example, a stone sculptor's rendering of hard or soft materials—such as jade or textiles—in contact with human flesh may show distinct responses between bodies and diverse materials and thereby demonstrate sensitivity to the surface qualities of portrayed bodies or things. Alternatively, a ceramic artist's emulation of painted book surfaces through the use of color, line, and burnishing may indicate a desire to emulate not only the color but also the surface quality of the original. Last, this paper addresses how artists manipulated actual surface textures of things in order to convey information about depicted surfaces or enhance the haptic experience of someone touching or holding that thing.

**Ono, Rintaro (National Museum of Ethnology), Jason Lebehn (Historic Preservation Office, Pohnpei State, FMS), Osamu Kataoka (Sophia University, Japan), Takuya Nagaoka (Pasifika Renaissance, Japan) and Scott Fitzpatrick (University of Oregon, USA)**

[83]

*When Did Early Migrants Reach Pohnpei? Human Migration, Interisland Networks, and Resource Use in Eastern Micronesia*

Previous archaeological research on islands in eastern Micronesia hint at possible early human migration from Melanesia by the descendants of Lapita groups. However, hard archaeological evidence has remained largely ephemeral. In this paper, we discuss recent findings from new archaeological excavations on Lenger, a lagoon island located in northern Pohnpei where previous research by the local historic preservation office and Japanese scholars in 2008 found a single piece of obsidian that may have originated from the Admiralty Islands in Melanesia. Our new research program on Lenger, which began in early 2019, has recovered a significant quantity of calcareous sand tempered (CST) pottery and a variety of shell artifacts in the form of tools and ornaments at a depth of 1 m in a white beach sand layer that was below current sea level. Here we discuss the preliminary results from two field seasons at the site, how these data contribute to our understanding of long-term resource use, and how the artifactual assemblage fits within known and potentially other interisland networks of trade and exchange.

**Orbegozo Hernández, Camila (Universidad de los Andes)**

[186]

*Arqueología para reivindicar: Huellas de africanía en la producción alfarera de Cartagena de Indias (S. XVI-XVIII)*

Desde el inicio de la trata transatlántica las poblaciones africanas y sus descendientes en América fueron inferiorizados e invisibilizados en múltiples aspectos. El sometimiento y esclavización de estas mujeres, hombres, niñas y niños, pretendía despojarlos de su humanidad y convertirlos en bienes útiles. Sin embargo, nunca dejaron de ser personas ni perdieron sus saberes ancestrales. Este trabajo tiene como propósito mostrar el aporte de las poblaciones africanas esclavizadas a las sociedades hispanoamericanas, utilizando la arqueología para demostrar desde la materialidad, su contribución, historia y los rasgos concretos de una identidad que les fue negada por su condición impuesta. El objetivo de este estudio es documentar los rasgos de africanía plasmados en la cerámica hallada en dos sitios arqueológicos coloniales de la ciudad de Cartagena de Indias: el Baluarte de San Ignacio y Casa de la Mantilla. Pretendo demostrar conexiones estilísticas entre el material cerámico excavado en Cartagena y la alfarería atribuida a poblaciones africanas esclavizadas en otros lugares de Latinoamérica, como Brasil y Jamaica. En esta medida, hago uso de la arqueología para evidenciar los aportes africanos en la producción cerámica colonial de Cartagena de Indias, visibilizándolos en el pasado para reivindicarlos en el presente.

Orengo, Hector [156] see Livarda, Alexandra

O'Rourke, Dennis [1] see Potter, Bethany  
O'Rourke, Dennis [83] see Stone, Jessica

Ortega, Cristina [98] see Cartajena, Isabel

**Ortega, Edgar and Gustavo Martinez**  
**[48]**

*Aspectos constructivos del Grupo Cascabel*

En la última década, el Proyecto Cuenca Mirador ha trabajado en el Grupo Cascabel ubicado al norte de la gran plaza principal del sitio El Mirador. Su meta ha sido la investigación arqueológica y consolidación arquitectónica de varios edificios de este grupo para conocer los aspectos constructivos de épocas tempranas en el sitio. Dos edificios mayores, la Estructura 200 y 204, han sido investigados intensivamente por medio de excavaciones horizontales y túneles, principalmente sobre las fachadas principales de ambos edificios. Se han documentado una arquitectura con escalinatas anchas central así mismo con gradas esquineras y cuerpos flanqueados con mascarones que se distribuyen por las fachadas. Hay vestigios de construcciones perecederas, y además evidencia de pisos y estadios constructivos desde el Preclásico Medio hasta el Preclásico Tardío. Tales estudios demuestran el significado e importancia de edificios tempranos en el diseño social y político de las sociedades Preclásicas en el sitio.

Ortega-San-Martín, Luis [128] see González Gómez de Agüero, Adrián

Ortiz, Agustín [101] see Pecci, Alessandra  
Ortiz, Agustín [177] see Barba, Luis

Ortiz, Agustin, Jr. [184] see Character, Leila

**Ortiz Brito, Alberto (University of Kentucky)**  
**[107]**

*The Meanings and Uses of the Past in the Present: A Case Study of the San Martín Pajapan Monument*

This presentation addresses the relation between archaeological patrimony and collective memory using the San Martín Pajapan (SMP) monument as a case study. The SMP monument is an Olmec monument found on the top of the San Martín Pajapan volcano of Los Tuxtlas region. According to ethnographic research done in the 1960s, the local communities settled in the vicinity of the volcano regarded the SMP as the embodiment of a deity called Chane. In 1966 Alfonso Medellín Zenil conducted an archaeological project aimed at moving the SMP monument from the volcano to the Museo de Antropología de Xalapa (MAX). Apparently, local communities let Medellín Zenil take monument to the museum; however, in the 2000s they requested the MAX to return it to them. Instead of returning the monument, the MAX decided to donate a replica of it, which local communities welcomed with a solemn ceremony in 2006. These two events led to a process of oblivion and remembrance of the SMP monument. In this presentation, I provide ethnographic data to indicate which beliefs related to this monument have been forgotten and what is still remembered. I argue that despite the oblivion effects it is still used as a local identity element.

**Ortman, Scott (CU-Boulder)**  
**[49]**

*CRM and Synthesis*

Today there is a growing movement to use accumulated archaeological information to contribute to discussions of general issues facing human societies, including our own. In this regard, the archaeological record is most unique and helpful when viewed at broad comparative scales concerning the long-term dynamics of households, settlements, and societies. Most of the data that are most relevant for these sorts of analyses are collected through the cultural resource management (CRM) process, but to a great extent, the basic observations of CRM, such as relative frequencies of stylistic artifact types, remain tailored to culture-historical questions that have little resonance beyond archaeology. What would it take for CRM data to become a means of studying social dynamics across societies? What sorts of data would be needed? In this paper I discuss this issue and suggest a few ways CRM archaeology could move productively in this direction.

**Ortman, Scott (CU-Boulder)**  
**[92]**

*Discussant*

Ortman, Scott [150] see Klassen, Sarah

**Osborn, Jo (University of Michigan), Camille Weinberg, Richard Espino Huaman and Kelita Perez Cubas**  
**[128]**

*The Development of Economic Specialization among Prehispanic Fishermen: The Case of Jahuay, Quebrada de Topará, Chinch*

According to colonial documents, Peruvian coastal societies were divided into economically specialized communities, some dedicated to agriculture and others to fishing. Archaeological studies have demonstrated that this economic organization predated the Inca Empire, but the origins of this system are still undefined. Since 2017, the Proyecto de Investigación Arqueológico de Jahuay has led excavations at Jahuay, a littoral village that was occupied by Topará fishermen during the late Early Horizon, when permanent hierarchical societies first appeared in the Ica region. We ask whether the shift in social and political organization may have contributed to economic changes as well. Did the Topará people rely on incipient economic specialization? Our research helps elucidate an understudied period in Peru's prehispanic economic development.

[128]

Chair

Osborn, Jo [128] see Espino Huaman, Richard

**O'Shea, John (University of Michigan)**

[98]

*Necessity, Not Novelty: Archaeology on Submerged Landscapes*

Despite recent advances in method and approach, the underwater archaeological record continues to make a negligible contribution of prehistoric research. This is due, in part, to a series of widespread but erroneous beliefs about the character of the submerged record. These include the belief that underwater finds are chance encounters that are not susceptible to systematic investigation, and that submerged sites and artifacts are only interpretable via reference to known terrestrial finds. This paper addresses these misconceptions. It is argued that the underwater context can be systematically investigated and, far from simply supplementing or amplifying what is already known from terrestrial research, can produce startling and unexpected results. These points are illustrated by reference to recent underwater research in Lake Huron and its implication for the "Standard Model" of Paleoindian archaeology in the Great Lakes region. It is concluded that terrestrial archaeologists ignore the underwater record at their peril.

O'Shea, John [52] see Reynolds, Robert

Osiecki, Zygmunt [54] see Lenzi, Michael

Osorio León, José [154] see Marengo, Nelda Issa

**Osterholtz, Anna (Mississippi State University/Cobb Institute of Archaeology)**

[127]

*The Body Poetic: Violence, Body Processing, and Identity Formation in the Past*

Deb Martin's legacy is one of exposing her students and colleagues to new theoretical models, asking everyone to contextualize bioarchaeological data within robust theoretical frameworks. Through Dr. Martin's mentorship, I began to think of the body differently. The human body can be viewed as an artifact of cultural expression, a mechanism for social communication, a malleable substance that can be shaped to meet the needs of the living. The Poetics model developed by Whitehead has been adapted to the study of the past through both the study of violence and the study of mortuary processing. In this paper, both applications of the Poetics model will be examined through bioarchaeological case studies, combining social theory and bioarchaeology employing a biocultural model. I will examine the role of both violence and processing at Sacred Ridge (~AD 800, southwestern Colorado) and the reuse of burial space within the church at Đurđevac-Sošice (eleventh- to sixteenth-century Medieval Croatia). These case studies span time and space, showing the relationship of the living and the dead and how the dead can be manipulated and processed to suit the needs of the living.

Otaola, Clara [175] see Morgan, Christopher

**Otárola-Castillo, Erik (Purdue University)**

[173]

*Why a Bayesian Archaeology? A Pain-Free Introduction*

Bayesian inference and its underlying philosophy offer an alternative to null hypothesis significance testing (NHST), the conventional statistical framework in archaeology. Due to new technological advances, Bayesian inference has become an essential component of broader scientific efforts and progressively prevalent in archaeological research. Here, without using the mathematical or statistical vernacular, I provide a sensible explanation of Bayesian statistics compared to NHST. I follow by clarifying why Bayesian inference (1) is a natural and powerful approach, (2) offers straightforward interpretations, and (3) applies to and might be desirable in archaeological research. To finish this paper, I briefly review how many archaeologists are currently using Bayesian statistics to solve analytical problems. Moreover, this paper will highlight potential areas where Bayesian inference's creative application might produce informative solutions. I will use examples from experimental and observational research on the analysis of butchery marks and the dietary evolution of prehistoric peoples on the North American Great Plains.

[173]

Chair

Otárola-Castillo, Erik [173] see Coon, Sarah

Otárola-Castillo, Erik [10] see De la Puente-León, Gabriela

Otárola-Castillo, Erik [13] see Hill, Matthew

Otárola-Castillo, Erik [74] see Keevil, Trevor  
 Otárola-Castillo, Erik [173] see May, Alejandra  
 Otárola-Castillo, Erik [12] see Torquato, Melissa

Ouellet, Jean-Christophe [103] see Gates St-Pierre, Christian

#### **Owen, Ross (Dudek)**

[77]

##### *Scratching the Surface: An Interdisciplinary Approach to the South Mountain Metarhyolite Quarries*

The prehistoric quarries of South Mountain, the primary source for metarhyolite in Pennsylvania, are well-known for their importance as a lithic resource—especially in association to the Susquehanna Broadspear industry. While they are widely known, the quarries have not been studied intensively. This presentation will focus on the use of x-ray fluorescence (XRF) analysis used to gain a better understanding of the lithic material and the potential to trace artifacts to their origins through geochemical analysis. The findings have helped to establish future research potential and management priorities and recommendations for metarhyolite quarry sites located on Commonwealth lands.

Owenby, Gary [119] see Powis, Terry

#### **Owsley, Douglas (Smithsonian Institution), Karin Bruwelheide (Smithsonian Institution), Éadaoin Harney (Harvard University), William Kelso (Jamestown Rediscovery) and David Reich (Harvard University)**

[55]

##### *Identifying Seventeenth-Century Africans and High-Status Englishmen at Jamestown, Virginia*

Emerging investigative techniques and access to reference skeletal series and comparative databases allow enhanced interpretation and recognition of individuals in the seventeenth-century Chesapeake region for which few documentary sources or identifying artifacts exist. As part of a pilot study of burials from Jamestown, genome-wide ancient DNA were obtained from four poorly preserved skeletons: a male and female excavated from within the 1607 Fort palisade, originally identified as colonists from the first years of the settlement, and two high-status males buried in the chancel of the 1608 church. Based on historical and bioarchaeological evidence, the latter are suspected kinsmen of the colony's first governor, Thomas West, 3rd Lord De La Warr. Archaeological, historical, genealogical, osteological, and genetic evidence are integrated in this approach. The male and female excavated from the Fort possess African ancestry—most closely related to present-day Nigerian populations—with no European ancestry. The men in the church have European ancestry and share a rare mitochondrial haplogroup that may be indicative of unanticipated maternal relatedness. This interdisciplinary study demonstrates how remarkable methodological analyses can transform interpretations often guided by preconceived notions of identity based on site context and the inherent limitations of the historical and bioarchaeological record.

Özbasaran, Mihriban [31] see Ugras, Funda

Padian, Michael [19] see Gallagher, Joanne

#### **Padilla-Iglesias, Cecilia (Institute of Anthropology, University of Zurich), Claudine Gravel-Miguel (Arizona State University) and Robert Bischoff (Arizona State University)**

[195]

##### *An Agent-Based Model to Explore the Relationship between Archaeological Assemblages, Past Social Networks, and Cultural Dynamics*

The need to relate static archaeological sites to the dynamic processes responsible for their formation is central to the utility of archaeological data for testing hypotheses about the lives of prehistoric humans, and how ecological and social changes affected them. Here we use an agent-based simulation to investigate how different factors influence the ability of researchers to reconstruct prehistoric social networks from artifact stylistic similarities, as well as the overall diversity of cultural traits observed in archaeological assemblages. Given that cultural transmission and evolution are affected by multiple interacting phenomena, our model is unique in that it allows us to simultaneously explore different sets of factors that may condition how social networks relate to shared culture between individuals and groups. These include factors relating to (1) the structure of social groups, (2) selection pressures acting on cultural traits, (3) individual learning strategies, (4) the context in which different types of cultural traits are learnt, and (5) the specific method used to reconstruct ancient social networks. Whilst the archaeological record offers a unique glimpse on cultural changes happening over long temporal scales, our model will shed light on how to relate patterns observed in the archaeological record to past social dynamics.

#### **Pailes, Matthew (University of Oklahoma) and Natalia Martínez-Tagüena (IPICYT)**

[175]

##### *The Role of Future Discounting in Subsistence Decisions: The Case of Hohokam Agave Farming*

This presentation will investigate the relevance of future discounting behavior to precolonial subsistence decisions by examining *Agave* sp. bajada cultivation among the Hohokam of southern Arizona during the Classic period, AD 1150–1450. The Hohokam Classic period was tumultuous and included a variety of social upheavals that resulted from and precipitated subsistence shortages.

During this period, several communities lessened their investment in agave cultivation or substantially shifted production strategies. A program of experimental archaeology demonstrates agave's higher kcal/hour return than most approaches to maize agriculture, making these changes difficult to interpret based on return rates alone. This paper will argue this counterintuitive behavior is explained by agave's decade-long maturation period, which made it unattractive relative to more immediate return resources in any context that presented risks to land tenure. This case study illustrates that even slight discounting of future rewards can lead groups to tolerate greater near-term risk and/or lower return rates.

**Pain, Ross (Australian National University) and Anton Killin (Mount Allison University)**

[58]

*Cognitive Archaeology and the Minimum Necessary Competence Problem*

Cognitive archaeology faces the problem of minimum necessary competence: as the most sophisticated thinking of ancient hominins may have been in domains that leave no archaeological signature, it is safest to assume that tool production and use reflects only the lower boundary of cognitive capacities. Cognitive archaeology involves selecting a model from the cognitive sciences and then assessing some aspect of the material record through that lens. We give examples to show that background theoretical commitments in cognitive science that inform those models lead to different minimum necessary competence results. This raises an important question: what principles should guide us in selecting a model from the cognitive sciences? We outline two complementary responses to this question. The first involves using independent lines of evidence to converge on a particular capacity. The second is a broader suggestion. Theoretical diversity is a good thing in science but is only beneficial over a limited amount of time. According to recent modeling work, one way of limiting diversity is to introduce extreme priors. We argue that having a broad spectrum of views in the philosophy of cognitive science may actually help cognitive archaeologists address the problem of minimum necessary competence.

**Paine, Richard (University of Utah), Kevin Johnston (unaffiliated scholar), Enrique Hernandez (Universidad de San Carlos, Guatemala) and Richard Hansen (University of Utah)**

[48]

*Hidden Structures at El Mirador: Challenges and Prospects*

Invisible structures present serious and difficult to solve challenges for Mayanists. Despite a generation of research into Classic period invisible structures, we know little about their prevalence, history, or range of uses. We know even less about invisible structures from the Preclassic. Invisible structures are clearly widespread at El Mirador, but their true extent is unknown. Excavation of invisible structures at El Mirador reveals a range of construction methods and possible uses, and sometimes complicated sequences of construction. We will discuss our attempts to sample invisible structures, based on remote sensing using GPR, and excavations of identified invisible structures to assess chronology and function.

**Painter, Autumn (Michigan State University), Jeffrey Painter (Michigan State University), Jodie O'Gorman (Michigan State University) and Terrance Martin (Illinois State Museum Curator Emeritus)**

[105]

*Surviving or Thriving? Reassessing Social Interaction and Warfare Related Food Insecurity at Morton Village*

Violent interaction between people of the Oneota and Mississippian traditions in the Central Illinois River Valley in the North American Midcontinent ca. 1300–1400 CE at Norris Farms #36 is a clear example of intermittent, low-scale warfare. One aspect of initial interpretations of the interaction, based on evidence for raiding of small work groups away from the village and initial zooarchaeology findings, identified resulting stress and subsistence insecurity within the Oneota population. While evidence of violence is clear, the faunal evidence for subsistence insecurity is based on a small sample of contexts from a restricted section of the adjoining habitation site, Morton Village. Recent excavations focused on a broader sampling of the village document a more complex interaction. The expanded data support a complex and productive community of local Mississippian and migrant Oneota peoples engaged in a process of coalescence, further complicating the earlier representations. In this paper, we reexamine the evidence of violence-related food insecurity through an analysis of faunal remains from a random sample of contexts across the entire village. Our results refine past interpretations of Oneota and Mississippian interactions, and indicate that we must continue to refine our models and methods for detecting food insecurity in the past.

Painter, Jeffrey [105] see Painter, Autumn

**Pal Chowdhury, Manasij (University of Manchester), Stuart Campbell (University of Manchester) and Michael Buckley (University of Manchester)**

[29]

*What's Cooking? A Proteomic Approach to Analyze Ceramic Residues from Tell Khaiber 1*

Analysis of biomolecules absorbed in unglazed ceramics can provide valuable information about pottery use in antiquity, including detailed information on ancient diet. Such investigation has mostly focused on the analysis of lipids, but recently the more labile proteins have seen increased attention as they are capable of providing more specific information. In this study, we analyze absorbed proteins extracted from a collection of eight ceramic shards obtained from Tell Khaiber, two mounds from the Sealand Dynasty period in present-day Iraq, near the ancient city of Ur. ATR-FTIR and elemental analyses (CHN) of the ceramics will be presented, along with results of the proteomic analysis using LC-MS (Orbitrap) and MALDI based techniques. Our results show that surviving proteins in archaeological ceramics can act as specific biomarkers for dietary practices- this is exemplified by the identification of evidence of soybean use from one of the shards, the earliest such occurrence in Mesopotamia and one of the earliest outside East Asia.

**Palacios, Horvey (University of Central Florida), J. Marla Toyne (University of Central Florida), Michael Callaghan (University of Central Florida) and Brigitte Kovacevich (University of Central Florida)**

**[67]**

*The Bioarchaeological and Mortuary Patterns at Holtun, Guatemala: an Analysis of Residential and Plaza Burials*

In the Maya area, bioarchaeological and mortuary analysis can help identify patterns of mortuary ritual and social experience of past peoples. However, there is very little bioarchaeological and mortuary evidence for the developing complexity and social experience of the Preclassic period. Major ceremonial centers like Naranjo, Tikal, and Yaxha surround Holtun, which suggests it articulated with the broader sociopolitical sphere of the Petén region. This research uses osteobiographic narratives to contextualize the mortuary and biological profiles of 19 individuals interred at Holtun to examine bioarchaeological variation by residential structures and through the Preclassic and Late Classic periods of occupation. This research also incorporates statistical clustering and a comparative osteobiographic approach to identify broad patterns of shared mortuary and biological variation within Holtun and other sites of the Petén region. The results of this analysis contribute to our first understandings of Preclassic period mortuary and biological variation in the southern lowlands and Holtun's relationship to nearby ceremonial centers. Examining the daily lived experiences of individuals within Holtun and the greater Petén area through a comparative approach increases our understanding of shared ancient Maya social identities and mortuary rituals ubiquitous in the region.

**Palazzolo, Kyle (California State University, Chico)**

**[31]**

*When Mortars Speak Volumes: Assessing the Influence of Mortar Cavity Size on Processing Efficiency*

Among the various categories of ground stone technology in precolonial California, the mortar has a celebrated role in the shift to a subsistence economy dominated by acorn processing and consumption. The size and shape of mortars, both bedrock and portable, facilitated pulverizing and grinding of these and other resources. It seems logical, therefore, to assume that larger mortar cavities would be more productive than smaller ones. The experiment presented here was designed and conducted to test this hypothesis; it aims to determine whether increasing the depth and width of a mortar cavity improves acorn flour production. While there are various constraints to making larger mortars (such as time, material, labor/exertion, mobility, etc.), understanding the efficiency of mortars with greater volume is an essential first step to assessing the cost-benefit trade-off inherent to the design choices that were made by Native Americans.

Palazzolo, Thomas [52] see Reynolds, Robert

Palka, Joel [59] see Lozada, Josuhé

Palka, Joel [189] see Sanchez, Fabiola

**Palonka, Radoslaw, Katarzyna Ciomek (Jagiellonian University, Kraków), Vincent MacMillan (Canyons of the Ancients National Monument), Ross Gralia (Canyons of the Ancients National Monument) and Maiya Gralia (Canyons of the Ancients National Monument)**

**[53]**

*Archaeoastronomy, Beliefs, and Violence: Documentation, Methodology, and Visualization of Rock Art Panels from CANM, Colorado (USA)*

This paper focuses on the presentation of selected examples of Ancestral Pueblo and historic Ute rock art panels located in the Sand Canyon and Sandstone Canyon areas within the Canyons of the Ancients National Monument (CANM), southwestern Colorado, USA, and raises some methodological questions. Some of the panels depict fighting and hunting scenes while others might have been connected with astronomical observations as seasonal, solar, or lunar markers and the possible ceremonies and rituals associated with them. At three of these sites, and from 2018 to 2020, direct field observations were conducted during the summer and winter solstices and spring/fall equinoxes as well as in the periods between them. These observations yielded some interesting results and were supplemented by research in ethnographic literature as well as simulations and visualizations using different software. The methodology for recording of rock art panels included on-site hand drawing, but mostly photography, photogrammetry, and laser scanning documentation. The registered data has been used to generate accurate 2D documentation and 3D models as well as RTI (Reflectance Transformation Imaging) analysis. Hopi representatives were also consulted in the field regarding some of these rock art panels, offering invaluable help and interpretations based on their oral traditions.

**Palumbo, Scott (College of Lake County)**

**[178]**

*Assessing Agricultural Intensification in Greater Chiriquí during the Aguas Buenas Period*

The Aguas Buenas (roughly 300 BC–AD 900) was a period characterized by the growth of small villages and the development of identifiable settlement hierarchies in certain areas. This paper applies a variant of the site catchment analysis originally articulated by Steponaitis (1981) to evaluate the relationship between archaeological site location and soil fertility to consider the relationship between emergent centers and smaller settlements. Two case studies drawn largely from pedestrian survey are explored: the middle Térraba of Costa Rica and the upper Chiriquí Viejo of Panama.

**Panahipour, Mitra (New York University, Institute for the Study of the Ancient World)**

**[168]**

*Deh Luran Archaeological Landscape: A Reassessment*

**[WITHDRAWN]**

**Pantel, Agamemnon (Pantel, del Cueto & Associates) and Chester Walker****[85]***Methodological Approaches to Search and Recovery of World War II MIAs***[WITHDRAWN]****Paredes Gudino, Blanca (INAH)****[71]***Desarrollo del sistema agrícola de terrazas en el Paisaje del sureste de la Cuenca de México*

El uso de un enfoque con carácter holístico, como lo es el concepto de Paisaje, ha permitido una visión y análisis integral en el estudio de las características sobre uno de los sistemas agrícolas tradicionales más importantes desde la época prehispánica, como son las terrazas, el cual persiste hasta nuestros días. Con ello, a través del Proyecto Paisaje Cultural en Milpa Alta, hemos podido distinguir, registrar y analizar los diferentes componentes materiales de dicha práctica, avanzando en el conocimiento de sus características, tipología, distribución, dimensiones, formas de organización, y lo más importante, el estudio de los asentamientos en torno a éstas, quiénes fueron sus pobladores, cómo vivían; aplicando para ello como base teórico-metodológica la línea de la Arqueología del Paisaje. Por ello, con el presente trabajo, se pretende mostrar la evolución del citado proyecto desde esta perspectiva, presentando los avances de investigación.

**Paris, Elizabeth (University of Calgary), Roberto López Bravo (Universidad de Ciencias y Artes de Chiapas) and Gabriel Lalo Jacinto (INAH-Chiapas)****[136]***Economic Integration across Political Boundaries in Highland Chiapas*

This paper examines the integration of small polity economies in highland Chiapas, and the ways in which polity size and proximity were factors. This region formed part of the western frontier of the Maya linguistic and cultural area, and has been characterized as a relatively autonomous economic and political periphery. Beginning in the Late Classic period, a network of small polities proliferated throughout highland Chiapas. We draw on our excavations at the multiple sites political centers in the Jovel Valley in the western Chiapas highlands, as well as our excavations at the larger center of Tenam Puente. We observe that economic integration between highland polities manifested more highly with respect to geographic distance as opposed to polity size, with a higher degree of economic integration between polities within the Jovel Valley and a relatively low degree of economic integration between the Jovel Valley and Tenam Puente. Furthermore, we consider whether the degree of economic integration between polities shifted from the Late Classic to the Early Postclassic periods, as the sociopolitical turmoil of lowland Maya polities to the north and east began to affect long-distance exchange and alliance networks.

Paris, Elizabeth [13] see George, Miranda

**Parish, Ryan (University of Memphis)****[77]***Characterizing Spatial Variability of Chert to Inform Sampling Strategies*

Sampling is crucial in characterizing variability in chert at a spatial scale meaningful for provenance data needed to explain prehistoric human behavior. Nearly four decades ago Barbara Luedtke examined the extent and kind of trace element variation in Burlington chert as a mechanism to determine sample size. The current study quantifies the spectral variation within Dover chert to demonstrate that an understanding of variation in chert is necessary to ensure representativeness and characterization of the source. As the need for finer spatial resolution in chert source data increases, from determining formation type to a specific deposit, so should the number of geologic reference samples. In turn, if our ability to determine source becomes more precise, so should that of our anthropologic explanations.

Parish, Ryan [51] see Giles, Bretton

Parish, Ryan [77] see Sherman, Simon

**Parker, Evan (Tulane University)****[188]***Discussant*

Parkinson, Jennifer [42] see Pobiner, Briana

Parra, Manuel [65] see Gallaga, Emiliano

**Parsons, Ted (University of Alaska, Anchorage)****[10]***Recent Developments in Small and Low-Cost 3D Scanning Systems***[WITHDRAWN]**



**Pascual Soto, Arturo (Instituto de Investigaciones Estéticas, UNAM)****[122]***El Tajín en tiempos de 13 Conejo: Expresiones de un nuevo estatuto simbólico (ca. 800–1100 dC)*

Si bien el culto al soberano no podría expresar de mejor manera el carácter sagrado que se le confería de antiguo y el extraordinario poder que se concentraba en su persona, es en El Tajín cuando evoluciona sobre las bases de una ideología de reciente introducción hacia una liturgia ligada a una tradición cultural que en el Epiclásico se estará extendiendo por Mesoamérica siguiendo el litoral del Golfo de México. Es justo a estos nuevos grupos políticos a quienes debemos de atribuir hacia el año 800 dC la construcción del imponente Edificio de las Columnas como también el desarrollo de un estilo artístico estrechamente ligado con la expresión de un nuevo estatuto simbólico. La ponencia explora desde la perspectiva de los monumentos promovidos por los gobernantes de la ciudad los cambios que se generan en el arte de El Tajín, los temas que aborda y el contexto político y social al que se vinculan dichas transformaciones.

Passalacqua, Nicholas [38] see Kolpan, Katharine

**Passerini, Annapaola (Cornell University)****[130]***Radiocarbon Challenges: Tightening the Chronology of the Kura-Araxes Culture in the South Caucasus*

The Kura-Araxes horizon (KA; 3500–2500 BCE), which characterizes the EBA in the South Caucasus, is at the center of an archaeological debate regarding the timing of its development and dispersal into areas of the greater Near East, including eastern Anatolia, northwestern Iran, and the Southern Levant. Increasing numbers of <sup>14</sup>C datasets in the last couple of decades have shed light on the broader absolute timeframe and material periodization in the Caucasian “homeland.” However, even with advances in chronometric approaches, we struggle to capture the considerable heterogeneity of the KA material culture in shared regional contexts. The reversals and plateaus of the calibration curve between 3500 and 2500 BCE pose particular problems. They foster an impression of chronological continuity that overplays a sense of “contemporaneity” in the making of archaeological phases. This, in turn, impacts the social interpretation of the KA chronology due to the difficulty in distinguishing discrete events or groupings. Hence discerning change from continuity becomes problematic. This paper critically addresses chronometric challenges in the dating of the KA horizon and assesses the potential of site-based Bayesian approaches against summing methods, such as kernel density plots, to navigate multiple scales of chronological inquiry.

**Patterson, Carol****[46]***Katsina Runners in Basketmaker II through Pueblo III Petroglyphs in the Northern San Juan Basin*

Runners have always played an important role in Pueblo life, as with all tribes in the Southwest. They carried messages and trade items across great distances between prehistoric villages. Ritual racing around villages and out to sacred shrines have served to inspire the clouds to bring rain and keep the Sun and Moon on track during their annual journeys. A prehistoric portrait of three Ancestral Pueblo runners on a cliff wall deep in Grand Gulch of Cedar Mesa gives clues to many other possible depictions of runners throughout the Northern San Juan Region. Ritual running brings clouds, rain, and prosperity. Clouds are “rain bringers” and believed to be the essence of Katsina spirits. Portraits of these rain bringing spirits are found paralleling known travel routes including Chaco roads. Some Katsinas love racing humans. These Katsinas are identified by their boxy ears like those of Palavikuna known as the Red Skirt Runner and Homsona, a runner “who cuts hair.” Together with color codes and body gestures, one can see the cultural continuity from BMII–PIII images of Katsina runners and the contemporary Racing Katsinas of today.

**Patton, Katherine (University of Toronto), Gabriel Hrynick (University of New Brunswick) and Arthur Anderson (University of New England)****[103]***Evaluating the Timing and Duration of Dwelling and Non-dwelling Elements in the Reversing Falls Site, a Middle Maritime Woodland Shell Midden in the Far Northeast*

In this paper we consider the temporal relationships between dwellings and shell-bearing deposits at the Reversing Falls site in the Maine-Maritimes region of the far Northeast. Shell middens are multitemporal, comprised of the archaeological signatures of historical processes that took place over vastly different durations. They are also stratigraphically complex and difficult to interpret; moreover, coarse-scale site chronologies have made it difficult to assess the tempo of daily household activities and, in particular, the relationship between midden and dwelling deposits. In fact, in the Maine-Maritimes region, archaeologists have tended to assume that dwellings shell-bearing deposits at sites like Reversing Falls represent events occurring together gradually and homogeneously over a millennium. This pilot project uses radiocarbon dating, sedimentological, and stratification data amassed from column samples to test this assumption and to see what they might reveal about the temporality of dwelling and non-dwelling deposits at this particular site; our results should contribute to our understanding of shell-midden site formation, but also aspects of Ancestral Wabanaki household organization, settlement, and mobility.

Pavlovic, Daniel [157] see Martínez-Carrasco, Andrea

**Pavlovics, Victoria (University of Florida), Courtney Sprain (University of Florida), Lindsay Bloch (Florida Museum of Natural History) and Neill Wallis (Florida Museum of Natural History)****[17]***Rock Magnetic Characterization of Florida Pottery*

The methods used in artifact provenance in archaeological research is constantly being added to and updated. Identifying the geographical origin of the artifacts can provide information about past mobility patterns and interaction networks. There are a number of mineralogical and elemental methods currently used to characterize pottery composition, but they are not always sufficient when the compositions do not vary much, such as in the depleted alluvial sediments of Florida. Rock magnetic techniques have been used to help assess provenance where other techniques have failed. Magnetic analysis can also be useful in learning about the firing temperature of a baked artifact. Florida's inhabitants have been making pottery since the late Archaic period, around 4,000 years ago. Composition of the clay and the techniques used to make this pottery changes by region and time period. Currently, no one has assessed the magnetic properties of Florida pottery. Here, I will present preliminary rock magnetic analyses of Floridian potsherds within the Florida Museum of Natural History's collection to better understand their magnetic properties with the goal of assessing if we can use magnetic techniques to better determine provenance and firing history.

Payntar, Nicole [74] see Covey, R. Alan

Pazan, Kyra [151] see Stewart, Brian

**Pearson, Kristen (Harvard University)**

[93]

*Ethnoarchaeology, Human-Animal Relationships, and Participatory Research in Mongolia*

In Mongolia, ethnoarchaeological methods have been applied to questions of mobility, spatial organization, site formation, and animal husbandry practices, among others. An area that remains to be explored is the application of ethnoarchaeological methods to the study of craft production, particularly as it relates to distinctive local resources, ecologies, and mobile lifeways. In this paper, I present the results of ethnoarchaeology fieldwork focused on craft production in organic materials, especially materials of animal origin. By studying contemporary craft practices and their material manifestations, I aim to construct an interpretive framework for the organic archaeological record in Mongolia and surrounding regions. By placing craft objects in their social and environmental contexts, their relevance to larger social and environmental questions becomes apparent. This is demonstrated through case studies that bring historical and archaeological material into conversation with ethnoarchaeological findings. This paper will also discuss the outcomes of an online participatory research and cultural heritage initiative that was undertaken in response to the COVID-19 pandemic. Building off of research questions and community concerns identified in the course of the presented ethnoarchaeological field research, this project provides a model for remote participatory heritage documentation with potential applications beyond the pandemic.

**Pecci, Alessandra (University of Barcelona), Agustín Ortiz (Laboratorio de Prospección Arqueológica, IIA, UNA), Luis Barba (Laboratorio de Prospección Arqueológica, IIA, UNA) and Natalia Moragas (University of Barcelona)**

[101]

*First Results of the Archaeological Prospection at the N2E1 and N2E2 Quadrants (Barrio del Río San Juan) at Teotihuacan*

During the years 2017–2020, the UNAM and the University of Barcelona carried out an international and interdisciplinary project in the N2E1 and N2E2 quadrants of Millon's map at Teotihuacan (Barrio del Río San Juan). This very central location had not been deeply investigated until then. The project aimed to better understand the organization of this area located to the north of the San Juan River, the organization of buildings in space, and to identify the neighborhood center. We were also looking to understand if there were different construction phases. Prior research involved an extensive magnetic survey and the verification of specific areas with ground penetrating radar and electric resistivity. The results obtained allow us to identify a change in the organization of space in time, the presence of large plazas in the last phase, possible workshops, and to confirm the existence of a greater number of important structures than the ones already identified by Millon. The project is part of the activities of the Laboratorio de Prospección Arqueológica of the UNAM and the ERAAUB Consolidated Group (2017SGR1043) and is financed by the Spanish Fundación Palarq and Ministerio de Cultura y Deporte.

Pechenkina, Kate [29] see Miller, Melanie

**Peck, Katherine (University of New Mexico), Noa Lincoln (University of Hawai'i) and Michael Graves (University of New Mexico)**

[194]

*Soil Nutrient Variability in the South Kohala Field System, Hawai'i Island*

The uplands of Kawaihae 1 ahupua'a, Hawai'i Island, contain a dense fixed-field agricultural field system built, utilized, and occupied by Hawaiians from as early as the seventeenth century into the nineteenth–early twentieth century. This field system includes a diverse array of agricultural practices including fixed-field agriculture, planting mounds, terracing, and water management features such as 'auwai (irrigation ditches). In order to investigate this field system's past and present agricultural potential—particularly in light of the landscape's aridity—a soil sampling regimen was undertaken along an elevational transect through a portion of the field system. These soils were then described and analyzed for a suite of values including resin extractable phosphorous, cation exchange capacity, total elements, base saturation, pH, and soil moisture. These results and their implications for soil development, geomorphology, and agricultural viability within this archaeological landscape are discussed. The latter is of particular interest to the Kailapa Community Association, which includes members of the Kawaihae descendant community, who are interested in managing this landscape.

Pecora, Albert [38] see Burks, Jarrod

**Peebles, Matt (Arizona State University)**

[137]

*Networks, Community Detection, and Critical Scales of Interaction in the US Southwest/Mexican Northwest*

Archaeologists have long recognized that spatial relationships are an important influence on and driver of all manner of social processes at scales from the local to the continental or even beyond. Recent research in the realm of complex networks focused on community detection in human networks suggests that there may be certain critical scales at which human spatial interactions can be partitioned, allowing researchers to draw boundaries that provide insights into a variety of social phenomena. Thus far, this research has been focused on short time scales and has not explored the legacies of historic relationships on the evolution of network communities and boundaries over the long-term. In this paper, we examine networks based on material cultural similarity drawing on a large settlement and material culture database from the US Snakeskin and Corn Markings: The Dotted-Diamond-Grid Pattern in the Southwest/Mexican Northwest (ca. AD 800–1800; encompassing over 1,000,000 km<sup>2</sup>) divided into a series of short temporal intervals. With these temporally sequenced networks we (1) explore the utility of several methods of network community detection, (2) evaluate whether there are key phase transitions in the scales of network communities, and (3) explore the role of previous network configurations in the evolution of network communities through time.

Peebles, Matt [125] see Torvinen, Andrea

Peláez Castellanos, Yolanda [155] see Takatsuchi, Ryohei

**Peña, José (University of Arizona) and Robert Tykot (University of South Florida)**

[125]

*Understanding Pottery Production at El Campanario (Huarmey-Peru) through Ceramic Paste Analysis and pXRF*

The present research focuses on the strategies in the procurement of raw material used in the production of pottery at the El Campanario site during the beginning of the Late Intermediate period (AD 1150–1280). The manufacture of pottery occurred within the domestic areas at this site and while domestic pottery was recovered during excavation, there was also evidence of ceramics containing press-molded, incise, and painted decoration. This research combine ceramic paste analysis as well as elemental compositional analysis (pXRF) in order to observed the potters' technological choices in the production of pottery. Paste analysis conducted on pottery sherds discovered at El Campanario shows high variability in paste composition, suggesting that potters obtained raw materials from various sources. The geological information of the valley suggests that various sources were used in the procurement of temper for the manufacture of pottery. The selection of geological areas can be interpreted as varying technological traditions, which were learned within the household or community. The sharing of knowledge and experiences occurred within the social group and was then transmitted through generations. In addition, compositional analysis was also conducted on pottery sherds, which shows similarities in elemental composition of the clay in almost the pottery analyzed.

Peña, José [182] see Cuello del Pozo, Paloma

Peña, José [14] see Ritter, Alexandra

**Penny, Simon (University of California, Irvine)**

[121]

*Discussant*

**Pepe, James (Janus Research)**

[187]

*North Woodlawn Cemetery: CRM and the Legacy of Jim Crow*

North Woodlawn Cemetery served Fort Lauderdale's African American community during the period of legislated racial segregation. In the 1960s, part of the cemetery was purchased by the State of Florida and incorporated into the Right-of-Way (ROW) for Interstate 95. In 2012, Janus Research began working with the Florida Department of Transportation (FDOT) on possible improvements in the vicinity of North Woodlawn. A major part of this research involved ascertaining if unmarked graves were present within the I-95 ROW. An assumption of project archaeologists and planners was that local citizens would welcome the excavation of remains from the ROW for reburial within extant cemetery boundaries. Public outreach soon made it obvious that this view was not shared by the local community. Through continued consultation between FDOT, the Florida State Historic Preservation Officer, Janus Research, and local stakeholders, creative methods for investigation and preservation at North Woodlawn were reached. Field methodology was limited to remote sensing techniques, including use of a cadaver dog, ground-penetrating radar (GPR), and radar tomography. Extensive interviews with local informants were an important component of the investigation. In the end, project engineers, state planners, local politicians, and community activists were able to collaboratively achieve mutual project goals.

Peralta, Eva [96] see Neme, Gustavo

**Peres, Tanya (Florida State University)**

[73]

*Discussant*

**Peres, Tanya (Florida State University)****[156]***Perishable Politics: Food and the Everyday Sociopolitical Identity*

Gastropolitics are the creation and maintenance of social and political relationships through the making and consuming of meals. Archaeology allows us to recover the residues of meals and associated culinary equipment from secure contexts. Foodways data, when integrated with other data classes such as paleodemography and spatial patterning, can help us to differentiate between past social and political relationships. The two main areas in recent gastropolitical studies are the identification of feasting events and the co-occurrence of social status and food remains. I add a third less-often covered area of study, that of quotidian meals, as these have as much to tell us about social, economic, and power relations as feasts do, and are an integral part of gastropolitics. Here I build the case for longitudinal archaeological studies that integrate multiple data classes (quantitative and qualitatively) to understand the role of food in constructing and maintaining social organization, political structure, and group identity.

**Perez, Angelica, Fernanda Lucia Sandoval (ENAH) and José Luis Punzo Díaz (INAH)****[71]***The Tarascan Landscapes of the City of Tzintzuntzan: Dwelling in the Hillside and in the Lakes*

The ancient prehispanic city of Tzintzuntzan was a cosmopolitan and highly stratified settlement that is distributed between two great hills, the Tariaqueri and the Yahuarato. Its ancient builders gained flat land on the slopes of the hills to form huge platforms where they built their great temples and palaces, as well as a large number of small terraces that allowed the construction of neighborhoods and houses of several tens of thousands of people who lived in it. On the other hand, the relationship between the hill and the lake were the elements of the landscape that order the city and produced a distinctive pattern of urbanization of what would be the largest prehispanic city in western Mexico upon the arrival of the Spanish in the sixteenth century.

Pérez, Carlos [96] see Martínez Milantchi, María Mercedes

**Perez, Daniel (University of Nevada, Las Vegas) and Karen Harry (University of Nevada, Las Vegas)****[96]***Virgin Branch Puebloan Adaptations on the Colorado Plateau: Recent Excavations at Granary House (AZ A:14:46)*

The upper reaches of the Virgin Branch Puebloan region—particularly, the western Colorado Plateau—has largely remained understudied, partly resulting from difficulties accessing many areas yielding cultural activity. While the majority of data collection has been amassed through surveys, excavations on the western Colorado Plateau have significantly broadened the archaeological record within this zone of the Virgin region. In particular, recent excavations—undertaken by the Department of Anthropology, University of Nevada, Las Vegas—have contributed to a greater understanding of adaptation strategies, subsistence, and chronology within late prehistory. Framed by excavation data from Granary House (AZ A:14:46), this paper presents preliminary findings regarding the Virgin Branch Puebloan occupation of a hamlet site on the southern portion of the Shivwits Plateau. On the basis of collected flotation and various artifact data (lithics, ceramics, and ground stone)—and coupled with chronometric data—inferences and implications are presented regarding occupational strategies and regional interactions within this remote portion of the North American Southwest.

**[96]***Chair*

Perez, Daniel [28] see Goad, Kari

Perez, Daniel [46] see Van Alstyne, Benjamin

**Perez, Gary, Joe Tellez (Professional Geographer), Andrew May (Mapworks), Janet Stock (Independent Researcher) and Alfred Alaniz (Alamo Colleges District)****[143]***Pictograph Iconography and Geologic Realities at 41VV124 The White Shaman Mural*

The White Shaman Mural, a Pecos River style (PRS) rock art site located in a Pecos River tributary canyon, is dated from 2420 ± 80 to 1460 ± 80 RCYBP (radiocarbon years before present). At that time, prehistoric indigenous hunter-gatherers inhabited this semiarid environment and traveled seasonally to obtain resources. Research indicates the mural represents cumulative knowledge and not solely artistic expression. Some icons may be spiritually significant or narrative. Others appear to represent survival resources. One particular icon seems to represent four fountain springs of the South Texas Balcones Escarpment. These springs issue from the Edwards Aquifer and exist where hydraulic pressure is sufficient to force water up through wells and faults. Research indicates their importance prehistorically, historically and currently. We tested the hypothesis that these icons represent a resource map of South Texas using Geographic Information Systems and research of historical records of indigenous/European contact. The creators seem to have established relative distance between the four springs measuring elapsed travel time. They accurately painted fountain spring icons on the mural spaced according to transit time. Results of the research have implications for current and future PRS rock art interpretation.

**Pérez, Ventura (University of Massachusetts, Amherst)****[112]***Discussant*

**Pérez, Ventura (University of Massachusetts, Amherst)****[127]***A Four-Field View in an Increasingly Myopic World*

Our scientific perspectives of the world are bound to moments of clarity. Clarity comes from the realization that the questions worth asking are the ones that illuminate the human experience while understanding positionality and privilege in the exploration of those questions. As an MA student, Dr. Martin encouraged me to develop a methodology that combines microscopy of cut marks with detailed taphonomic reconstruction of each category of bone damage. She pushed me into asking questions that moved me far beyond the "checklist" osteology of trauma pattern recognition. I developed a methodology that allowed me to contribute to our understanding of the human arrival and occupation of Madagascar while at the same time exploring the concept of "evil" as an ideological construction of a moral imperative as it relates to violence. This paper surveys human bone assemblages around the world and throughout time to analyze the complexity, variability, and ambiguities surrounding the processing of human remains. The emphasis is on problematizing and challenging prominent discourses on violence by using a trans-temporal analysis of performative violence. It also explores consequences of the discourses in which we, as anthropologists, engage in both academia and media as we celebrate Dr. Martin's mentorship.

Pérez, Ventura [127] see Ralston, Clair

Perez Cubas, Kelita [128] see Osborn, Jo

**Pérez-Roldán, Gilberto (Universidad Autónoma de San Luis Potosí)****[50]***La industria del hueso trabajado en un barrio y en un palacio de Teotihuacan: Teopancazco y Xalla*

Teopancazco se ha considerado un barrio de clase media donde los trabajadores artesanales se dedicaron a confeccionar artículos de vestimenta para la élite que habitó ese barrio. Mientras que Xalla es un sitio que se considera un palacio administrativo y cívico-religioso. Además, existieron artesanos de élite, dedicados a confeccionar materiales ornamentales y vestimentas para la clase gobernante. En este estudio veremos las diferencias y similitudes de los objetos hechos en hueso, asta y dientes, pues se considera que los artesanos aprendieron las mismas técnicas pero las materias primas los hace diferentes. Para cada conjunto, se presentarán los resultados de las técnicas y usos de las herramientas de hueso así como técnicas foráneas que los artesanos incorporaron en Teotihuacan por ejemplo desde las regiones del área maya.

Pérez Ruíz, Francisco [154] see Marengo, Nelda Issa

Perla-Barrera, Divina [132] see Sion, Julien

Perron, Taylor [66] see Schmidt, Morgan

Perrotti, Angelina [3] see Dozier, Crystal

Perry, Megan [20] see Taylor, Corinne

Perttula, Timothy [51] see Lambert, Shawn

Petchey, Fiona [130] see Schmid, Magdalena

**Peters, Ann (University of Pennsylvania Museum)****[128]***Tracing Relationships over Time: Models of Exchange in the Greater Ica Region during the Paracas-Nasca Transition*

Research on the "Paracas Necropolis" textile assemblage from the Necropolis of Wari Kayan and comparisons with contemporary artifacts has led to the development of models of artifact production and uses (*chaîne opératoire*), with evident implications for models of the social relations of production. The processes considered include the procurement of component materials, the acquisition of production skills, a diverse array of crafting practices, the pragmatic, social, and ritual uses of the artifact, and its final—or not so final—deposition in a cache or mortuary context. Relationships of form, both within and across classes of artifacts, imply social contact and the exchange of ideas, labor, artifacts, and people. I look at intersections between these two analytic approaches to develop a model of social relations of production and exchange that structured—and were transformed by—the Paracas-Nasca transition.

**Peterson, Jane (Marquette University) and Michael Gregory (Independent Scholar)****[184]***Bronzeville's Backyards: Red-Line Realities in a Vibrant Community*

Material remains and historical documents related to a house in Chicago's turn-of-the-century Bronzeville neighborhood provide unique glimpses into the everyday life of African Americans who traveled to this northern, industrial metropolis as part of the Great Migration. Excavated deposits produced stratigraphically arranged layers rich in artifacts that speak to both the opportunities and constraints faced by the home's residents. We interpret emergent patterns related to consumerism, intersectional identity, and public health in the context of critical theoretical insights gleaned from African Diaspora, urban, household/feminist, and public archaeologies. These insights demonstrate archaeology's relevance in counteracting a range of historic and contemporary forces that converge to erase this period from public memory. Lastly, we consider the role Bronzeville archaeology plays in shedding light on the challenges associated with continuing urban segregation and health vulnerabilities.

Petit, Christophe [179] see Taieb, Juliette

**Petrie, Cameron (University of Cambridge)**

[92]

*Cities, Towns, and Villages in the Diverse Environments of the Indus Civilization*

The urban phase of South Asia's Indus Civilization (ca. 2600–1900 BC) does not offer simple parallels to other contemporary complex societies. This paper will present new insights into Indus settlement networks and the diversity of Indus urbanism. There were apparently only four large-scale (80+ ha) Indus settlements, which were polycentric, with walls and platforms demarcating distinct zones, and characterized by large- and small-scale public and private buildings, heterarchical social structures, communal activities, and collective action. These cities were considerable distances apart and situated in different ecological zones within the greater region occupied by Indus populations, and the majority of the population appears to have lived in medium- and small-sized rural settlements in the intervening areas. Significantly, it appears that urban and rural dynamics took different forms in each region, and Indus cities and their relationships with their rural hinterlands transformed over time. There is evidence for different interactive dynamics in "upstream" and "downstream" locations in the Indus River Basin, and settlement instability and population mobility between sites situated in marginal areas characterized by unpredictable access to groundwater. Change, displacement, and mobility all thus appear to have played important roles in the dynamism, transformation, and longevity of Indus settlement networks.

Petrie, Cameron [123] see Bates, Jennifer

**Phanomvan, Phacharaphorn (University of Oxford)**

[92]

*The Missing Big Picture: Settlement Size and Patterns in Western Mainland Southeast Asia during the First Millennium CE*

How were cities distributed in Mainland Southeast Asia in the past? What were the population estimates and patterns in the cities? Answering these questions leads to an understanding of long-term urbanization patterns, and the historical legacies associated with the geographical effects on development. However, to date, there is no comprehensive record of spatially explicit, settlement-level population data at a regional scale. Here, I develop a dataset of cities and settlements across Myanmar, Thailand, and Peninsula Malaysia in the first millennium CE using historical and archaeological records. This research refines Southeast Asian data presented in the global series on population estimates developed by Chandler and Modelski and addresses the data weakness mentioned by recent works from Reba, Reitma, and Seto (2016). The dataset is the first to identify the macro-pattern of settlement distribution in Southeast Asia. The study takes a different approach from Southeast Asian literature on urbanism and explores the history of urbanization across the landscape. It identifies three unique instances across time and multi-polar centers of agglomeration during the first millennium CE. Finally, I provide the first macro-population estimates for the region. This serves to help refine analysis on drivers of growth and constraints on regional agglomeration.

**Phelps, Danielle (University of Arizona)**

[78]

*Erasing the Past: The Intentional Forgetting of Amarna Period Artifacts in the Tomb of Tutankhamun*

Tutankhamun, one of the last kings of the Eighteenth Dynasty of ancient Egypt (ca. 1330–1300 BCE), was buried in a non-royal tomb in the Valley of the Kings in Egypt. His burial assemblage is one of the most intact burials ever discovered in Egypt. Among the many items are atypical items that have not been found in other late Eighteenth Dynasty burials. The atypical artifacts are from Tutankhamun's childhood, heirlooms, and artifacts associated with the names of Tutankhamun's immediate family members. The purpose behind the inclusion of the atypical artifacts is unknown. This presentation will examine the atypical artifacts through the utilization of statistical analyses, such as the Chi-Square, and the anthropological theories of memory works and secrecy to suggest that they are inalienable objects which were intentionally placed in the tomb to be forgotten. They were not destroyed because of their connection to the Amarna period but instead were deposited in Tutankhamun's tomb as a means to intentionally forget any association with Amarna "heretic" kings or the religion.

**Phillips, Lori (Washington State University), Erin Thornton (Washington State University) and Eleanor Harrison-Buck (University of New Hampshire)**

[80]

*Ancient Maya Use of Fauna from the Wetlands and Beyond*

Understanding how the ancient Maya interacted with wetland environments has been a topic of research for roughly 50 years. Previous studies suggest these resource-rich environments provided a diverse assortment of flora and fauna for the ancient Maya to utilize. Wetlands provide an ideal environment for evaluating long-held claims about the overall ancient Maya diet, which often emphasizes a reliance on large-bodied terrestrial mammals like white-tailed deer and peccary with less emphasis on smaller, wetland fidelic species. From 2015 to 2019, we investigated human-wetland interactions, targeting midden deposits from Maya

archaeological sites within the lower Belize River watershed where some of the largest tracts of wetlands are found in Belize. We present zooarchaeological results from sites located proximate to these wetlands. Results suggest small-bodied aquatic animals, particularly turtles, were a key component of the overall diet compared to terrestrial mammals. These data are further corroborated by the presence of ceramic net weights recovered from these sites, dating to the Classic–Postclassic transition (ca. AD 800–1200). This study offers insight into site-specific climate histories through swamp-fidelic fauna, which was still widely available in the wetlands of Belize despite long-term drought conditions that characterize the climate histories across much of the Maya Lowlands.

**Phillips, Natasha (University of Wollongong), Ian Moffat (Flinders University), Matthew Shaw (University of Wollongong), Christopher Ames (University of Wollongong) and Alex Mackay (University of Wollongong)**

**[151]**

*Investigating the Formation History of Surface Archaeology in the Doring River Valley, South Africa*

**[WITHDRAWN]**

Phon, Kaseka [150] see Hendrickson, Mitch

Pierce, Daniel [171] see Breault, Sarah

Pierce, Daniel [171] see Crawford, Dawn

Pierce, Daniel [30] see Crider, Destiny

Pierson, Arielle [64] see Kassabaum, Megan

**Piezonka, Henny (Christian Albrechts University Kiel, Germany), Enkhtuul Chadraabaal (Independent Researcher), Jonathan Ethier (Christian Albrechts University Kiel, Germany), Martin Oczipka (Hochschule für Technik und Wirtschaft Dresden) and Christian Ressel (Christian Albrechts University Kiel, Germany)**

**[93]**

*Abandoned Cities in the Steppe: Roles and Perception of Early Modern Religious and Military Centers in Nomadic Mongolia*

Towns and cities have been an integral part of the Mongolian nomadic society for more than a millennium, and abandoned urban sites from various periods dot the land, inscribing memories of lost empires and long-gone alliances into the cultural landscape. The relation between sedentary urban and mobile pastoralist lifeways has constituted a key cultural, economic, and political factor in one of the major pastoralist formations in Eurasia. The era in which most modern Mongolian cities are rooted is the period of Manchu rule in the seventeenth to early twentieth centuries. Subsequent political developments led to the abandonment or forced destruction of many of these urban focal points. Our project will study lost cities of this influential period of Mongolian history to solve the conundrum behind the sociocultural, economic, and political dynamism associated with these religious and military urban centers. In an innovative interdisciplinary approach, the study combines archaeological, historical, and ethnographic methods to trace the entanglement of former significance, historical perception, and current roles and interpretations of abandoned Manchu period urban settlements.

Pigière, Fabienne [72] see Erauw, Céline

**Pike, Jean (ARC | Architecture/Landscape Research CoLab) and Deborah Leishman (ARC | Architecture/Landscape Research CoLab)**

**[46]**

*Deconstructing Hybrid Architectures: A Bayesian Methodology for the Analysis of Precontact Southwest Architecture*

Our collaborative practice operates at the intersection of architecture, archaeology, and Bayesian statistics to formulate a new methodology for the analysis of precontact architecture. Our methodology expands the quantity and the scope of indicators previously considered in order to provide deeper insight into possible ideational, functional, cultural, and social affinities and the complex relationship between materiality and social relations. Utilizing Bayesian network analysis, our method seeks to track the movement of architectural ideologies and methods through the analysis of similar formal building types at discrete locations. Our initial analysis selects two sites, McPhee Pueblo, Dolores, Colorado (AD 850–910)—often cited in the literature as a precedent for Pueblo Bonito—and the large Hohokam ball court at Snaketown, Arizona (AD 700–1000) and asks: which is most similar to Pueblo Bonito ca. AD 920?

**Piña Martínez, Aarón (INAH/CNA/Dirección Operación de Sitios) and Annick Daneels (Universidad Nacional Autónoma de México)**

**[181]**

*Patrones de movilidad como reflejo de la concepción del diseño urbano: Un caso del Centro Sur de Veracruz en el Clásico*

En la actualidad, la visita a las zonas arqueológicas está determinada por un recorrido establecido por cuestiones de conservación y disfrute. Sin embargo, la movilidad dentro de las ciudades prehispánicas estuvo organizada por el diseño urbano, y su desarrollo a través del tiempo, determinado por factores sociales, económicos, políticos y religiosos en boga. Para estudiar las características de esta movilidad, se analizan 31 sitios arqueológicos de jerarquía alta e intermedia de la Cuenca Baja de los ríos Jamapa-Cotaxtla en el Centro Sur de Veracruz, México, caracterizados por tener su última etapa constructiva en el Clásico Tardío del Golfo de México, ser construidos con tierra y tener el arreglo arquitectónico llamado Plano Estándar. A pesar de esta aparente similitud, el

estudio de movilidad usando los métodos de Sintaxis Espacial mediante DepthMap y de Perímetros y Campos Visuales, a una escala meso incluyendo el entorno alrededor de los conjuntos principales, revelan patrones muy distintos en cuanto la forma en que se controlaron los accesos, en particular hasta la cancha de juego de pelota, un elemento arquitectónico de mucha importancia para el periodo.

**Pineda de Carias, Maria-Cristina (National Autonomous University of Honduras), Vito Véliz (Instituto Arqueoastronomía y Patrimonio Cultural y Natural) and Ricardo Agurcia Fasquelle (Instituto Arqueoastronomía y Patrimonio Cultural y Natural)**  
[89]

*Estelas y calendarios de la Plaza del Sol de Copán, Honduras*

Presentamos un estudio arqueoastronómico del patrón de distribución espaciotemporal de seis estelas que Waxaklaju'n U B'aah K'awiil colocó en la Plaza del Sol de Copán, Honduras, entre 9.14.0.0.0 y 9.15.0.0.0. Realizamos observaciones astronómicas en la Plaza del Sol entre 2000 y 2010; revisiones históricas, epigráficas e iconográficas; y un análisis cronológico, secuencial e integral de la ubicación, orientación y distribución de cada estela, interpretando posibles técnicas de observación astronómica para determinar el número, lugar y disposición del arreglo. Encontramos que, para celebrar el décimo cuarto k'atun e inicio del décimo quinto coincidente con un nuevo Tzolk'in, Waxaklaju'n U B'aah K'awiil siguió un programa que incluyó celebraciones de la Cuenta Larga, el Tzolk'in y las fiestas de fin e inicio del año solar. Encontramos también que, la localización y distribución de las estelas revela la existencia de calendarios solares horizontales de salidas y puestas, en los que cada estela es un marcador direccional de eventos del año solar y el Tzolk'in, lo que interpretamos pudo ser el propósito de la conformación del arreglo. La iconografía de las Estelas H y A fortalece nuestra interpretación de que el arreglo responde a un patrón de señalamiento permanente del año solar y del Tzolk'in.

Pinto Duarte, Yolanda [146] see Lubkemann, Stephen

**Pinto Lima, Helena (Museu Paraense Emilio Goeldi, Brazil)**

[66]

*OCA—Culture, Origins, and Environment: Archaeological Collaborative Research in the Lower Xingu*

The project investigates the historical ecology of a poorly studied area: the confluence of the Xingu and Amazon Rivers, in the lower Amazon region. By investigating distinct lines of archaeological evidence on a regional scale, it addresses, as an underlying research theme, the relationships among environmental factors, material culture, and human groups. From a diachronic perspective, it highlights the forms of human-environment interaction with particular interest in understanding the processes of formation and use of the anthropogenic soils; the creation of cultural forests; and the stylistic interactions of material culture. The project is based at the Goeldi Museum in Belem/Para/Brazil and involves several archaeologists, anthropologists, historians, biologists, geographers, and several students. We will present results from field and lab work done since 2014, including the regional chronology, questions of territoriality, and use of space and landscaping, both in the precolumbian indigenous past, interactions resulting from the complex colonial history of this region, as well as some aspects of today's *ribeirinhos* culture. It is developed in full collaboration with the inhabitants of Gurupá, making the knowledge construction a shared experience.

[66]

*Chair*

**Piscitelli, Matthew (SEARCH / Field Museum)**

[187]

*Out of the Darkness and into the Light: Why CRM Needs to Move Beyond Producing Gray Literature*

This is a call to action for CRM professionals and archaeologists more broadly. In a world of viral tweets and social media influencers, the past is getting swept under the rug. Our work is regulated to gray literature, a checked box before breaking ground. Nevertheless, our efforts reveal powerful human stories with the power to inspire, to educate, to bring change. As environmental regulations that laid the foundation for our industry ebb and flow according to partisan politics, we must advocate for why cultural heritage deserves protecting. As funding for archaeological research shrinks, we must demonstrate the value of the fragments of the past we unearth. This presentation argues for the benefits of meaningful public outreach in archaeology—a message many echo, but few truly hear—because the future of our industry depends on it.

**Pitblado, Bonnie (University of Oklahoma)**

[60]

*Discussant*

**Pitblado, Bonnie (University of Oklahoma)**

[75]

*Discussant*

Pluckhahn, Thomas [137] see Wallis, Neill



**Plumlee, R. Scott (Gila River Indian Community, CRM Program), Kyle Woodson (Gila River Indian Community, CRM Program), Craig Fertelmes (Logan Simpson), Chris Loendorf (Gila River Indian Community, CRM Program) and Steven Forman (Baylor University)**

**[143]**

*Mind the Gap: Absolute Dating of Middle Gila River Canals Provides Evidence for 1,500 Years of Continuous Irrigation Agriculture in the Phoenix Basin*

Evidence suggests that the first irrigation canals along the Middle Gila River were built by at least the Vahki phase ca. AD 450, and the construction and use of canals continued throughout the remainder of prehistory. Canal systems are also a prominent part of the historical lifeway of the Akimel O'Odham who live in the Hohokam core area today, with reported examples from at least the eighteenth century through today. Until recently, most researchers have assumed a gap existed between the presumed end of canal construction around AD 1450, and the canals that were historically documented in the early 1700s. However, recent Optically Stimulated Luminescence dating of canal deposits within the Gila River Indian Community include dates that bridge the assumed gap between the archaeologically documented prehistoric canals and the historically reported canal systems. The continuity of dating suggests that the various iterations of these systems have been in continuous use for at least 1,500 years. This possibility is supported by additional lines of evidence including O'Odham traditional knowledge and continuity in material culture along the Middle Gila River.

Plunket, Patricia [30] see Torres Porras, Alicia

**Pobiner, Briana (NMNH, Smithsonian Institution), Laurence Dumouchel (Wichita State University) and Jennifer Parkinson (University of San Diego)**

**[42]**

*A New Semi-quantitative Method for Identifying Carnivore-Specific Chewing Damage Patterns*

Hypotheses of hominin scavenging from different felid species have been proposed, but the ability to distinguish between the taphonomic patterns inflicted by different felid species in the fossil record is currently underdeveloped. Previous efforts to identify taxon-specific taphonomic patterns inflicted by felids, which have largely focused on tooth marks, have not yielded promising results. As a Dienje Kenyon Memorial Fellowship recipient in 2000, Briana Pobiner's research project was focused on identifying carnivore taxon-specific bone damage patterns. Here, Pobiner and two coauthors build on her earlier work by presenting a new low-cost, low-tech, semi-quantitative method for coding carnivore-inflicted gross bone damage patterns, including a visual guide to different levels of bone damage inflicted on different skeletal elements and portions. A blind test of this method by three experienced taphonomic analysts indicates that this method is easy to use and results in consistent data across analysts. We also apply this method to quantify the intensity of damage that free-ranging African lions inflicted on zebra bones as a first step in identifying felid-specific taphonomic signatures.

**Poehler, Eric**

**[167]**

*Discussant*

**Poister, Nicholas (University of New Mexico), Laura Baumann (National Park Service), Jennifer Waters (Desert Archaeology Inc.) and Steve Baumann (National Park Service)**

**[158]**

*Bighorn Sheep Bone Caches in the Lava Tube Caves of El Malpais National Monument, New Mexico*

The rugged volcanic landscapes of El Malpais National Monument contain over 400 lava tube caves, some of which harbor the most southerly perennial ice in North America. Many of the caves also house the material record of precontact human use in the form of internal architecture, ceramic, and other artifacts. Caches of bighorn sheep (*Ovis canadensis*) bones, a species now extirpated from the area, are a reoccurring feature. Some of the caches are deposited in the deepest and most inaccessible chambers of the caves. Early twentieth-century ethnographies note a Puebloan prohibition against damaging the bones of game animals during butchery and cooking as these were designated to be placed on a special shrine. Among the Zuni, this shrine was reportedly located within a cave. The El Malpais bone caches may represent evidence of this ritual practice in antiquity. This would link the remains with a wider ceremonial pattern documented throughout Mesoamerica and still performed today as far south as the Guatemalan highlands. Alternatively, recent Park Service consultation with neighboring Pueblos suggests that ice caves formerly had a pragmatic function: the cold storage of meat. Radiometric and zooarchaeological analyses elucidate the circumstances of deposition of these suggestive faunal caches.

Pokiak, Letitia [179] see Desmarais, Danii

**Pollack, David (Kentucky Archaeological Survey), Bruce Manzano (Kentucky Archaeological Survey), A. Gwynn Henderson (Kentucky Archaeological Survey), Thomas Royster (Kentucky Archaeological Survey) and Moriah Raleigh (Kentucky Archaeological Survey)**

**[91]**

*Fort Ancient Wild Turkey (Meleagris gallopavo) Harvesting Strategies*

Wild turkeys (*Meleagris gallopavo silvestris*) were an important component in the diet of the middle Ohio Valley's Fort Ancient farming cultures from AD 1000 to 1750. Wild turkeys often accounted for about 4% of the meat consumed by village residents. Our research into Fort Ancient wild turkey harvesting practices has targeted the humerus, primarily, as this element is easily identified, is

sexually dimorphic by size, and is rarely modified, unlike other wild turkey leg and wing elements. Our research documented two different harvesting strategies based on our analysis of humeri recovered from five Fort Ancient villages in the middle Ohio Valley. Hunters following the Buffalo Pattern (46Pu31;  $n = 277$  humeri) took relatively equal numbers of males and females, while those following the Fox Farm Pattern (15Ms1;  $n = 264$  humeri) took more than twice as many males as females. In our study area, the Fox Farm Pattern was practiced at villages with longer occupational histories. By focusing on males and not overhunting hens, residents could maintain a viable wild turkey population within the vicinity of their village, thereby contributing to the longevity of their community.

**Pool, Christopher (University of Kentucky) and Michael Loughlin (Cardno)**

[104]

*Reconstructing Population Histories in the Gulf Lowlands: Review and Prospect*

Over the past three decades the Gulf Lowlands of Mexico have witnessed an explosion of systematically collected archaeological survey data. The Gulf Lowlands, however, present particular challenges for the collection of data, reconstruction of local population histories, and comparison among datasets within and beyond the region. These include (1) a dynamic geomorphology of meandering rivers with deep alluvial valleys interrupted by a historically active volcanic range with variable depths and distributions of ashfall strongly affect the preservation and surface visibility of archaeological features; (2) variable groundcover, including large areas of sugarcane production with low, dense, foliage that seasonally can frustrate lidar detection as well as surface visibility; (3) varying pedestrian survey and collection strategies; (4) an archaeological record containing accretional residential platforms large enough to have supported multiple residences and documented areas of non-mounded occupation; and (5) application of widely divergent assumptions in estimating and comparing population sizes. In this paper we critically review approaches to collecting and interpreting population history data in the southern and south-central Gulf Lowlands, compare pedestrian and lidar-aided survey data recently collected in the Eastern Lower Papaloapan Basin and suggest ways to reconcile and compare population histories derived from diverse datasets.

**Pool, Kelly (Metcalf Archaeological Consultants Inc.)**

[153]

*Elizabeth Ann Morris: Dishwasher, Digger, Instructor, Professor*

Liz Morris (1932–2012) grew up surrounded by artifacts and archaeologists as the daughter of Earl and Ann Axtell Morris, renowned Southwestern and Mesoamerican archaeologists. She launched her own archaeological career in 1951 when she attended field camp at Pine Lawn, NM, where dishwashing and cataloguing were her main duties. Following a University of Arizona MA (1957) and four summers at Point of Pines field school, where she served as the only female dig foreman, she became U of A's first female anthropology PhD (1959). She discovered a love of teaching and, in 1970, became Colorado State University's first female archaeologist. Liz's "female firsts" mattered less to her, however, than her achievements as an archaeologist, educator, and mentor. She ran CSU's field school for 15 years, conducted pioneering research, and trained now-influential archaeologists until her retirement in 1988 as a full professor. The flow of her career demonstrates women's increased acceptance in the profession from the mid-twentieth century onward.

[153]

*Chair*

Pool, Marilen [133] see Bisulca, Christina

**Poolman, Laurel (Johns Hopkins University)**

[94]

*Animals at the Periphery: Investigating Urban Subsistence at Iron Age Sam'al (Zincirli Höyük, Turkey)*

The site of Zincirli Höyük, the ancient city of Sam'al, provides nuanced archaeological testimony to the complex interactions between imperial ambition and local concern in the Iron Age of Southern Anatolia (ca. 850–600 BCE). During this period, Syro-Hittite city-states gradually came under the political influence of the expanding Neo-Assyrian Empire. In the course of its expansion, the empire encountered and engaged with long-established cities, landscapes, ecologies, and attendant practices of animal husbandry. The comparative analysis of zooarchaeological remains from the site's Southern Citadel (Area 3) and Northern Lower Town (Areas 5 and 6), can attest to the ways in which the inhabitants of this ancient city adapted to projects of imperial integration. These excavations provide rich faunal assemblages and span Sam'al's transition from an Assyrian vassal to a provincial capital, testifying to practices of animal utilization in both upper and lower town contexts. This paper will present preliminary zooarchaeological analyses and examine patterns of change and stability in strategies of animal husbandry through this transition, revealing the ways that urban subsistence functioned as a political tool in situations of ancient imperialism.

**Pope, Carly**

[87]

*New Evidence for Ceramic Systems in Precolumbian Bocas del Toro, Panama*

For several thousand years before the arrival of Spanish explorers in 1502, Bocas del Toro, Panama, was home to numerous vibrant cultures. However, this area has seen only sporadic archaeological study over the past century. While surveys and excavations have revealed several multi-period settlements, with complex, multiphase ceramic assemblages, Bocas del Toro has generally been considered a cultural backwater and remained largely understudied (Linares 1977, 1980; Haberland 1976, 1984). Recent excavations on Isla Colón, Bocas del Toro, have uncovered a dense archaeological landscape including several habitation sites, burial and house mounds, and a diverse, sizable collection of subsistence remains and cultural materials. Several ceramic phases are evident, but the ceramic typology and chronology are still vague and unpublished. Additionally, many of the ceramic

artifacts found on Isla Colón appear to have been incorporated into wider systems of exchange and cultural interaction (Wake 2013; Wake and Martin 2016). Through the application of ceramic analysis, this research aims to identify the varieties of pottery being made and used on Isla Colón before AD 1500 by constructing a mutable typology. The classificatory system involves modal and compositional data in an effort to identify specific traits with cultural salience.

Porraz, Guillaume [151] see Ricci, Giulia

**Porter, Joshua (University of Arkansas), Alison Brooks, Scott Whittaker and John Yellen**

[170]

*Analysis of a Jun/Wasi Nut Cracking Stone from Western Ngamiland, Botswana: Implications for the Origins of Hominin Technology*

A nut cracking stone collected from a 1960s dry season occupation site at Dobe (Western Ngamiland, Botswana) shows not only evidence of cracking and pounding of mongongo nuts and other uses, but also repetitive flaking around the periphery. This flaking is reminiscent of the putative anvil stones from Lomekwi, Kenya (~3.3 Ma) and reinforces the idea that pounding technology is the origin of hominin stone use and tool production. Mongongo nuts were a major source of fat and protein in the Jun/wasi diet but the stones needed to crack them did not occur anywhere in the immediate vicinity of the mongongo groves or of the Dobe camp. The nearest sources are 14–30 km distant, so such stones had to be carried to the grove area and moved as needed. Since stone flaking was not part of Jun/wasi technology in the twentieth or late nineteenth century (according to elderly informants), we argue that the flaking is an unintended byproduct of its use as an anvil for nut cracking. Here we present an analysis of the flaking pattern and use wear present on the stone as possible indicators for distinguishing deliberate flaking from pounding technology in the early hominin record.

**Porter, Keri (Mississippi State University), Kaelyn Olson (Mississippi State University) and Andrea Lopez (Mississippi State University)**

[10]

*Free Photogrammetry: The Accuracy and Application of Open-Source SfM Software*

Photogrammetry is a technique that creates a 3D model from 2D images. Photogrammetry is currently being used in archaeology to create models of artifacts, structures, excavation profiles, and burials with almost unlimited applications. Although the use of proprietary software may be related to general user-friendliness and accessibility, the cost can still be substantial and restrictive. The use of open-source photogrammetry software can make 3D imaging more openly available to students and under-funded researchers. To examine the usefulness and accuracy of open-source software compared to proprietary software, models of a skull cast were made using Meshroom (open-source) and Agisoft Metashape (proprietary). These models were then compared using the open-source software, CloudCompare. Results indicate that although the proprietary software provides more customization, optimization, and support during modeling, the open-source software can produce a high quality model for research and recording. For example, models can be edited in Agisoft Metashape, but models made in Meshroom must be edited externally with an additional software. Application of this research can increase access to affordable SfM software and 3D modeling. However, more resources are available for training in proprietary software. Future projects will focus on creating instructional texts and videos for archaeologists using open-source SfM software.

**Portman, Katherine (University of Arizona) and Kelsey Reese (University of Notre Dame)**

[26]

*A Geospatial Assessment of Reservoirs and Nearby Communities on the Mesa Verde North Escarpment*

Water storage and control systems have long been of interest to archaeologists as a lens for studying communities' attempts to mitigate environmental instability, especially in arid environments. In recent years, the increased availability of high-resolution paleoclimate reconstructions and digital terrain models has provided archaeologists with new ways to assess these vital resource management features. We demonstrate how modeling the annual volume of water collected by reservoirs across several centuries can inform a more nuanced understanding of how communities both benefited from and organized around these features through time. This poster presents a case study of three Ancestral Pueblo reservoirs on the Mesa Verde North Escarpment, a topographically defined space located on the talus slopes between Mesa Verde National Park and the Great Sage Plain of southwestern Colorado in the northern US Southwest. Four distinct communities occupy the escarpment, three of which include a clearly defined reservoir feature. For this project, we employ a series of hydrological models to quantify the water collected within these three reservoirs through time. With this analysis, we can better interpret how Ancestral Pueblo people actually used reservoirs, invested in group-level sustainability strategies, and organized their communities in geographical borderlands.

**Posselt Santoyo, Emmanuel and Liana Jiménez Osorio**

[155]

*El paisaje del Yuvui Tayu de Ñuu Ndaya, Mixteca Alta, Oaxaca, México*

El yuvui tayu (reinado) de Ñuu Ndaya o Chalcatongo fue uno de los más importantes durante la época precolonial en la Mixteca Alta de Oaxaca. Esto lo sabemos gracias a los códices precoloniales y a los documentos coloniales. En el 2008 y 2016 realizamos dos recorridos arqueológicos de superficie en la parte norte de esta región, estos nos permitieron identificar diferentes tipos de sitios que integraron el paisaje de este reinado, como: pueblos grandes, medianos y pequeños, santuarios y lugares de agricultura. Bajo el enfoque de "la Gran Línea de Vida" en esta plática mostraremos la conformación de este yuvui tayu durante el Posclásico (900–1521 dC): su cabecera integrada por dos asentamientos, diversos santuarios (tanto construidos como naturales) y rutas de peregrinaciones. Asimismo, hablaremos de su devenir durante la colonización española, enfocándonos en los desplazamientos forzados de las poblaciones originarias para la formación de 4 congregaciones. Esta investigación se realizó a partir de la integración de diferentes fuentes: datos arqueológicos, códices mixtecos, documentos coloniales, así como narrativas orales,

conocimientos y percepciones de los habitantes contemporáneos de esta región.

Posselt Santoyo, Emmanuel [155] see Jiménez Osorio, Liana

**Potter, Bethany (University of Kansas), Caroline Kisielinski (University of Kansas), Justin Tackney (University of Kansas), Dennis O'Rourke (University of Kansas) and Frederic Sellet (University of Kansas)**

[1]

*Bloody Sharp Rocks: Optimization of aDNA Extraction from Experimental Lithic Artifacts*

Species detection using DNA recovered from lithic artifacts could indicate the manner in which tools were utilized and ultimately enhance our understanding of the mobility strategies and subsistence patterns employed by past peoples. Geneticists and archaeologists in the 1980s and 1990s managed to successfully extract DNA from lithics, using both modern experimental tools and lithic artifacts from archaeological contexts. These methods have seen little revision, despite advances in ancient DNA (aDNA) technologies over the past decade. In addition to teeth, bones, and wood, researchers can also consistently extract and sequence aDNA from non-endogenous environmental samples. These same advancements might allow the recovery of aDNA from lithic artifacts. We present results from an optimization study of aDNA extraction methods, using a set of experimental modern stone tools to identify methodological conditions for successful species detection.

Powell, Evelyn [100] see Borreggine, Marisa

**Powis, Terry (Kennesaw State University), George Micheletti (University of Central Florida), Matthew Tarleton (Kennesaw State University), Gary Owenby (Kennesaw State University) and Nicaela Cartagena (City College of New York)**

[119]

*Identifying the First Public and Domestic Constructions at Pacbitun, Belize*

Investigations in Plazas A and B of the site core at Pacbitun indicate that initial occupation began in the early Middle Preclassic period (900–600 BC). At this time, a small agricultural community was established in Plaza B beginning with a few domestic structures built just above bedrock. These early domiciles would also function as workshops for the production of marine shell beads. During the late Middle Preclassic (600–300 BC), the size of the community in Plaza B expanded five-fold, with rectangular-shaped platforms replacing the early apsidal structures and the shell bead industry intensifying significantly. It is during this period that two large ceremonial platforms were erected at the site. While these buildings represent the first two monumental constructions at Pacbitun, their unique physical and spatial attributes say much about their distinct identities as they relate to each other and to the domestic structures of Plaza B. The purpose of this presentation is to detail these distinct identities and discuss what each might tell us about the residents living and working in Plaza B. Comparative data from other sites will be utilized to see how Pacbitun fits within the broader Mamom sphere sweeping across the lowlands at this time.

[119]

*Chair*

Powis, Terry [152] see Micheletti, George

Powis, Terry [116] see Skaggs, Sheldon

**Praet, Estelle (University of York), Kitty Emery (Florida Museum of Natural History), Elizabeth Graham (University College of London), Norbert Stanchly (AS&G Archaeological Consulting) and Michael Buckley (University of Manchester)**

[72]

*ZooMing through the Maya: An Approach to Assess Mammal Diversity in Lamanai and Marco Gonzalez (Belize)*

Mammals are an essential part of the jungle world surrounding the Maya, both for their cosmovision and subsistence. Their identification in the archaeological record is essential to understand their complex role. This work, as a proof of concept, tested the application of Zooarchaeology by Mass Spectrometry (ZooMS) in Maya sites of Lamanai and Marco Gonzalez (Belize). ZooMS results revealed the higher diversity of mammals in inland Lamanai by presenting seven mammal species whereas only five—and all shared with Lamanai—occur on the coastal site of Marco Gonzalez. ZooMS indicated a high misidentification rate for small fragments through traditional zooarchaeology. Species identified through ZooMS are not necessarily the most common represented in either site. Finally, this work proved that the challenging preservation of tropical areas was not an obstacle to good results since the preservation stage did not determine the collagen yield. We argue that, beyond identification, the technique can be used as a biodiversity indicator, as a tool to compare iconography of animals and their actual use, as a complement to morphological identifications by traditional zooarchaeology, and as evidence of the lack of correlation between preservation and collagen yield. ZooMing is only possible by ZooMing out.

**Pratt, Jordan (Texas A&M University)**

[95]

*Haskett and Crescents: An Analysis of the Lithic Tools from Weed Lake Ditch, Oregon*

Several open-air sites with buried stemmed point technology have been discovered in the Harney Basin, southeastern Oregon. These sites provide a unique way to expand our current understanding of Western Stemmed lithic technology and subsistence practices from the late Pleistocene and early Holocene. The research presented here focuses on new results from Weed Lake Ditch, a site located on the relict margins of pluvial Lake Malheur. Previous excavations at Weed Lake Ditch recovered seven Haskett style stemmed points, six crescents, a bone needle, stone pendant, bone bead preform, and many non-diagnostic stone tools and faunal remains. This assemblage corresponds favorably with Younger Dryas aged occupations throughout the northern Great Basin; unfortunately, no precise radiometric evidence has been obtained from the site to date, and previously the association

between the stemmed points and crescents was not well understood. Over the course of the 2019 field season additional Haskett points were found in direct association with both crescents, preforms, and another bone needle. This paper reviews the spatial distribution and analysis of stone tools recovered during the 2018 and 2019 field seasons in order to explore lithic technological organization at the site.

Pratt, Jordan [13] see Juptner, Derick

Prentiss, Anna [39] see Brown, James

**Price, Max (Massachusetts Institute of Technology)**

**[94]**

*Swine, Kine, and Caprine: Divergent Political Economic and Ideological Trajectories of Mesopotamian Livestock*

Livestock are widely recognized as fundamental features of the political economies of ancient Near Eastern states. Animals served as “wealth on the hoof,” the strategic resources of urban institutions seeking to expand aspects of the subsistence economic to finance their activities and power. However, in the Mesopotamian world, different species played different roles in the emergence and evolution of urban states and the political economies that supported them. Why is it, for example, that sheep, goats, and cattle loomed large in the textual and artistic record of Mesopotamian institutions, while pigs were relatively rare? Why were pigs such a popular source of food and household magic? Focusing on the fourth and third millennia BC in southern and northern Mesopotamia, I examine how caprines, cattle, and pigs were mobilized (in both an economic and ideological sense) in different sectors (smallholder/communal vs. institutional) of the political economy of early cities in Mesopotamia. I argue that the affordances of different animals—their bodily and behavioral features that, within certain cultural and environmental contexts, promote particular types of engagements with human—launched cattle, pigs, and caprines onto these unique trajectories.

**Price, Michael (Santa Fe Institute)**

**[130]**

*End-to-End Bayesian Inference for Summarizing Sets of Radiocarbon Dates*

Aggregations of radiocarbon  $^{14}\text{C}$  dates are seeing increasing use as proxies for the relative population size through time of past societies and regions. Two major problems complicate the use of sets of radiocarbon dates as demographic proxies: the bias problem and the summary problem. The bias problem exists because the radiocarbon dates available for study are not necessarily representative of past population sizes (for example, more research effort has been allocated to one era over another). The summary problem exists because of sample size limitations, uncertainty in radiocarbon determinations, and ambiguity due to the radiocarbon calibration curve. The focus of this presentation is a novel statistical method for solving the summary problem, end-to-end Bayesian inference. I demonstrate the superior statistical and empirical properties of this approach compared to the current, dominant approach for summarizing sets of radiocarbon dates, summed probability densities (SPDs). I conclude by discussing approaches for addressing the bias problem, notably the need to fuse multiple types of data to improve demographic inference. Pertinent data include skeletal data on age-at-death, health, and stable isotopes (informative of migration); ancient and modern genetic data; radiocarbon dates; house and pottery counts, etc.

**Prieto, Gabriel (University of Florida)**

**[159]**

*At the Dusk of Chavín: Social, Economic, Political, and Ideological Implications as Viewed from a Fishing Settlement in the North Coast of Peru*

Recent progress in the refinement of absolute dates recovered at the ceremonial and pilgrimage center of Chavín de Huántar helps to reconsider the regional effects of the Chavín Sphere of Interaction in the north coast of Peru. These new data suggest that Chavín de Huántar was occupied for about 500/400 years. Although the nature of Chavín de Huántar is still elusive for the Moche Valley, thanks to recent excavations in Huanchaco, it is possible to evaluate the social, economic, political, and ideological post-effects left by the Chavín phenomenon in this north coast valley. Current excavations provided important domestic, ceremonial, and burial contexts associated with the post-Chavín occupation in the Huanchaco bay, which is summarized here as (1) the size and complexity of the residential settlement, (2) emergence of local elites, (3) local ritual practices, (4) long-trade exchange networks, and (5) subsistence patterns, as a proxy for the study of cultural change and as an indicator of environmental challenges during that period.

Prieto, Gabriel [159] see Comeca Ramirez, Gianina

Prieto, Gabriel [159] see Rivera Prince, Jordi

Prieto, Gabriel [182] see Schaefer, Benjamin

Prieto, Gabriel [159] see Sutter, Richard

Prignano, Luce [92] see Fulminante, Francesca

**Primeau, Kristy (NYS DEC)**

**[160]**

*Discussant*

**Primeau, Kristy (NYS DEC)****[176]***Current Trends in Archaeoacoustics*

In recent years, archaeological research has trended toward the exploration of the experiences of past people, particularly through engagement with the senses, seeking new methodologies and associated theories to develop this understanding. Sounds and auditory experiences occurred ubiquitously throughout time and within all cultures and were ascribed cultural meanings. Current research approaches to archaeoacoustics, psychoacoustics, neuroacoustics, soundscapes, and archaeomusicology are as variable as the sonic hypotheses that can be explored. The importance of what was and was not heard in the past is approached through a variety of methods including subject-centered survey, on-site experimentation and recording, reproduction or playing of instruments, and computer-aided modeling such as virtual reality or geographic information systems approaches. Theoretical approaches such as affordance theory, performance theory, and phenomenology situate our methods and task us to delve deeper, considering how auditory experiences conferred connotations of power or contributed to the formation of individual and group identities. This paper serves as an introduction to the papers being presented within the symposium "Archaeoacoustics: Sound, Hearing, and Experience in Archaeology," and presents a general overview of the field of archaeoacoustics by reviewing commonly employed methods and theories.

**[176]***Chair*

Primeau, Kristy [176] see Richards-Rissetto, Heather

**Prince-Buitenhuys, Julia (CA Department of Transportation)****[161]***Discussant***Priola, Victoria (University of Iowa)****[28]***Exploring the Function of Ceramic Crescents from the Copper Age of Southwestern Iberia (Third Millennium BCE)*

Lightweight crescent-shaped ceramics with perforations on each end are fairly common finds at Copper Age settlements in southwestern Iberia. These objects are usually assumed to be related to textile production, however, the actual function of these objects is often debated. Were these ceramic crescents, often weighing less than 100 g, heavy enough to function as loom weights on a warp-weighted loom? This poster presents the results of weaving experiments using reproductions of these ceramic crescents to explore their effectiveness as loom weights. Larger and heavier crescent-shaped loom weights found in the eastern region of the Mediterranean from the Bronze Age have been shown through experimental weaving to have unique advantages especially for twill style weaves on a warp-weighted loom. My research builds on these previous studies and illustrates that the crescents from the Copper Age of Iberia were also capable of functioning as loom weights effectively. This experimental work contributes to our understanding of textile production both within the Iberian Peninsula and in other regions of the Mediterranean.

**Prociuk, Nadya (University of Texas, Austin)****[108]***Silver against Skin: Exploring the Materiality of the Cividade de Bagunte Torques*

Among the most dazzling traces of behavior left behind by the Castro people of the Cividade de Bagunte in northwestern Iberia are the five silver torques discovered together in a hoard in the mid-twentieth century. The items in the Bagunte hoard share stylistic similarities with other Castro torques, but their material, silver rather than gold, marks them as unique in the corpus of Castro ornaments. Torques manifested a complex network of behaviors and values for the Castro people, and in this paper I aim to untangle the dense significance of these items of personal adornment. I will discuss the Bagunte torques as the particular material manifestations of economic and social forces expressed with technological finesse. I will also explore the social and symbolic work enacted by these objects, including their potential roles in social negotiations, ritual performances, and the formation, maintenance, and negotiation of personal and corporate identity.

Prufer, Keith [22] see Lemly, Marina

Prufer, Keith [22] see Thompson, Amy

**Pruitt, Elizabeth****[60]***Discussant***Pryor, John (CSU Fresno) and Shelby Jones-Cervantes****[7]***Burning Down the House: A Project that Is an Intersection of Tribal and Academic Interests*

This poster reports on a collaborative research project between CSU-Fresno Anthropology Department, UC San Diego, and the Santa Rosa Rancheria (Tachi Yokut). Baked clay or daub is an underappreciated piece of evidence from our past. Archaeologists often find pieces or concentrations of daub in old Native American village sites that occur in California's Central valley and foothills. Shelby Jones-Cervantes is doing her doctoral research at UC-San Diego on archaeomagnetic analysis (direction and field strength) of daub as a dating method. We were able to enhance our understanding of daub with the help of Santa Rosa Rancheria by building

a traditional Tachi Yokut structure made of tule and earth covering and then burned it down. This research will be a chapter in Shelby Jones-Cervantes's dissertation and provided an opportunity for the Tachi to reconnect with their cultural heritage. This is a perfect model of collaboration between Academic institutions and tribal groups.

**Puckett, Neil (Texas A&M CSFA)**

[98]

*The Walker Lake Landscape: Combining Geophysical Studies to Clarify Regional Change and the Archaeological Record*

The high desert basin surrounding Walker Lake, Nevada, has been subject to multiple landscape shifts since the lake reached its Late Pleistocene highstand, 15,679 cal BP. Research has identified at least four lake transgression and regression events postdating 5000 BP, and after its nineteenth-century historic highstand, the lake has fallen roughly 50 m. These changes reveal a complex fluvial and lacustrine system that past human populations would have adjusted to and exploited in a variety of ways. At times people had the opportunity to make use of a large waterbody and swift river filled with cutthroat trout, while at others the local resources would have been limited by a shallow, saline lake fed by an intermittent stream. To better understand the variability of this landscape, this paper details new research identifying geophysical and geomorphic data found on the basin's terrestrial landforms as well as underneath the modern lake. This research helps reveal the basin's past landscapes. Combined with the presence of archaeological sites found across the Walker Lake basin, these data help to clarify past behavioral adaptations and suggest a strong potential for site preservation below the lake's waters in buried, datable contexts.

**Puente, Nicholas (University of Colorado, Boulder) and Philip Arnold (Loyola University, Chicago)**

[2]

*Identifying the Archaeological Signatures of Inequality: An Analysis of Inequality at Late Formative La Joya and Bezuapan*

This poster presents an analysis of artifact assemblage data from La Joya and Bezuapan, two late Formative period (ca. 400 BC–AD 100) sites in southern Veracruz, Mexico. The study focuses on the ways in which wealth inequality is manifested in the archaeological record; wealth is defined here as the total of desirable factors consisting of two main categories that provide value, relational, and material forms. An analysis of systematic coring data in addition to information derived from in-field excavations provides insight into wealth inequality across households at the two sites. These data are interpreted using an economic measure known as the Gini index. The Gini index assesses the cumulative distribution of percentile values in reference to an assumed constant. This measure is increasingly applied to archaeological sites, and this poster seeks to provide another useful and comparable archaeology example of the Gini index's utility. This analysis will also provide additional information relevant to the study of Formative period societies along the Mexican Gulf lowlands.

**Pugliese, Francisco (MAE/USP Brazil), Roberto Ventura Santos (Institute of Geosciences, University of Brasília), Carlos Zimpel (Federal University of Rondonia [UNIR]) and Eduardo Neves (Museum of Archaeology and Ethnology, University of Sao Paulo)**

[87]

*An Independent Center of Early Ceramic Production in SW Amazonia*

Monte Castelo has one of the earliest records of ceramic production in the New World. Occupation of the site dates to between 6000 and 700 BP and demonstrates covariances between technological changes and environmental scenarios since the beginning of its chronology. We present petrographic, chemical, and isotopic data on ceramics from different periods to unveil the history of these materials, the very first known record of local development of ceramic technology in the American continent. The analyses permit the identification of possible sources of raw materials and their relationship to the construction of the site, shedding new light on long-term processes of landscape formation in the Amazon.

[87]

*Chair*

**Punzo Díaz, José Luis (INAH), Jakob Sedig (Harvard University), Alejandro Valdes Herrera (INAH-Michoacán) and David Reich (Harvard University)**

[55]

*First Results of the "Proyecto de investigación de poblaciones antiguas en el norte y occidente de México"*

Genomic analytical techniques have matured enough to address long-standing problems about the interactions and migrations of ancient populations inhabiting the north and west border of Mesoamerica, as well with populations from the US Southwest. With this in mind, we have established a collaborative, binational project between INAH and Harvard University, which we intend to be the largest such effort for the study of ancient populations in the aforementioned regions. We attempt to understand the phylogenetic relationships among the populations of these areas during the period between AD 600 and 1500. Twenty archaeologists and a group of geneticists collaborate to address how and when the populations from western and northern Mexico moved across the northern border of Mesoamerica, as well as the impact of such movement on northwest Mexico and the American Southwest. In this paper, we present the first results of the study.

Punzo Díaz, José Luis [71] see Perez, Angelica

**Quilter, Jeffrey (Peabody Museum, Harvard University)**

[69]

*Discussant*

Quinn, Allen [17] see Freund, Kyle

Quinn, Colin [13] see Dorr, Lana  
 Quinn, Colin [4] see Ivins, Erica

Quintana Morales, Eréndira [94] see Walshaw, Sarah  
 Quintana Morales, Eréndira [129] see Welker, Martin

**Rabinowitz, Adam (University of Texas, Austin)**

[97]

*Temporal Reasoning and Visualization across Periodized Archaeological Datasets: The Potential of the PeriodO Gazetteer*

This paper explores the potential of the PeriodO period gazetteer to facilitate temporal reasoning and visualization in archaeological datasets, both within and between stratigraphic databases that refer to PeriodO definitions for their period terms, and within and between datasets using only natural-language labels. The application of temporal logic to the stratification of archaeological sites is a long-standing practice, but it has generally been carried out on a narrative basis or through tools such as the Harris Matrix. The widely varying temporal scales of the units of observation, from a coin dated to a specific year, to a radiocarbon date range, to a general stylistic period, have, however, made it difficult to automate the capture and visualization of formal temporal-logical relationships between deposits at a single site, let alone across multiple sites. In spatial operations, the use of Linked Data gazetteers has facilitated such operations, and this paper proposes that the same could be true for temporal relationships. We sketch out some paths toward the computational use of PeriodO identifiers in the validation of relative and absolute dates in stratigraphic datasets, the establishment of chronological sequences on the basis of temporal logic, and the comparison of these sequences across multiple datasets.

Rabinowitz, Adam [174] see Wright, Sterling

**Radican, Kelsey (University of Texas, Austin), Alejandra May (Purdue University), Jennifer Miller (Max Planck Institute), Jessica Thompson (Yale University) and Elizabeth Gomani-Chindebvu (Department of Museums and Monuments, Lilongwe, Malawi)**

[40]

*Bead Production of the Later Stone Age in Northern Malawi*

Later Stone Age (LSA) bead production is typically reported with ostrich eggshell (OES) as the primary raw material. In south central Africa, land snail shell (LSS) was also used, but most sites have uncertain and poorly dated associations. The Malawi Ancient Lifeways and Peoples Project has now recovered both OES and LSS beads and preforms from securely dated LSA contexts at the Hora 1 and Mazinga 1 sites in the Mzimba District of northern Malawi. This shows that beads from both materials were made on site, as part of LSA technological behavior. However, both OES beads and unmodified OES are restricted to Pleistocene deposits. In the Holocene, LSS replaced OES as the sole raw material for bead production, and a directly dated preform from each site shows that this change took place at least by ~9500 cal BP. Bead production pathways also differ between the two time periods within the LSA, with pathway 1 (where blanks are first drilled and then shaped) dominating OES production and pathway 2 (where shaping precedes drilling) dominating LSS production. These results show how raw material availability and material properties influenced technical decision making at different times across the LSA.

Rafuse, Daniel [28] see Gutierrez, Maria

**Railey, Jim (SWCA, Albuquerque)**

[25]

*Stone Rings, Stone Piles, and Native Americans in Far Southeastern New Mexico*

As part of the Permian Basin Mitigation Program, the Bureau of Land Management created a project to investigate sites that may be traditional cultural properties of interest to the Mescalero Apache tribe. The project was awarded to SWCA Environmental Consultant's Albuquerque office. Most of the 18 targeted sites have stone-ring features, commonly assumed to mark the former presence of tipis or wickiups. Also found were small stone mounds that may be burial cairns. This poster examines basic data (such as stone-ring dimensions), potential temporal affiliations, landscape contexts, and some issues surrounding identification for some of these features. As for temporal affiliation, I explore arguments that tipis are a very late phenomenon in the region and across the southern Southwest and conclude that evidence for this claim is equivocal. One of the sites, with a cluster of so-called wickiup rings and an associated sheet midden with abundant artifacts, appears to be fully prehistoric and is similar to sites of the Cielo Complex to the south in west Texas except for the addition of ceramics.

**Rainville, Charles and Asa Randall (University of Oklahoma)**

[17]

*Geospatial Investigations into a Woodland Period Post Mold Alignment at the Silver Glen Springs Archaeological Complex, Florida*

The landscape of the Silver Glen Springs Archaeological Complex has been extensively modified for at least 9,000 years, including the construction of shell mounds and wooden post structures. The focus of previous research at this complex on reconstructing the massive Shell mounds and monuments along the spring run has left the non-mounded areas under-investigated. During the summer of 2018, a joint University of Oklahoma and University of Florida field school conducted a multisensor geophysical



investigation of the non-mounded areas, including ground-penetrating radar (GPR) and magnetic gradiometry. An oval alignment of anomalies was revealed in the magnetic gradiometry data. Targeted test unit excavations identified post-molds and deep pits, corroborating the geophysical data. The geophysical data were then post-processed and further investigated using spatial statistical methods in ArcGIS. The results suggest that the post-mold alignments, as well as other archaeological signatures at this site, have a distinct architectural logic in their relation with each other and the complex writ large. This poster will argue that the geophysical and excavation data tie the post alignment into the collection of monuments at the Silver Glen Springs archaeological complex, and that these monuments are part of a larger interconnected landscape of memory.

Raja, Mussa [124] see Bicho, Nuno  
 Raja, Mussa [151] see Haws, Jonathan  
 Raja, Mussa [68] see Skosey-LaLonde, Elena

Rakotozafy, Lucien [72] see Hixon, Sean

Raleigh, Moriah [91] see Pollack, David

**Ralston, Clair (University of Nevada, Las Vegas), Debra Martin (University of Nevada, Las Vegas), Pamela Stone (Hampshire College) and Ventura Pérez (University of Massachusetts, Amherst)**  
**[127]**

*Recovering "Los Antepasados": Bioarchaeology of a Historic Genízaro Community in Colonial New Mexico*

The Nuestra Señora de Belén Archaeological Project explores a colonial mission church and plaza site dating to the late eighteenth and nineteenth centuries in Belén, New Mexico. The colonial village of Belén was populated by a diverse community of Spanish and mixed-heritage individuals, including a number of Native American freed servants known as Genízaros. The bioarchaeological component of this multiyear project focuses on the reconstruction of lived experiences of this community of individuals who were marginalized from both Native American and Spanish communities and whose stories have been obscured by colonial and civic narratives. This project is a multidisciplinary cooperation that engages the local community by involving them in the research process, expressly recognizing their voices and position as stakeholders in how these stories have been and will be told. My work on this project was encouraged by Dr. Martin, who challenges those she mentors to be not only competent and productive researchers but impactful, diverse, and relevant scholars. She inspires me to identify research questions that tie into broader issues relevant to contemporary populations, particularly those addressing the social meanings underlying disparities in experiences of health, disease, and violence. That ethos resonates strongly throughout all aspects of this project.

**Ramirez, Estevan (University of California, Riverside) and Kenichiro Tsukamoto (University of California, Riverside)**  
**[22]**

*Photogrammetric Documentation of Burials at the Archaeological Site of El Palmar, Mexico*

The application of photogrammetry has been a growing interest in archaeological research. Among different archaeological contexts, burials highlight the effectiveness of photogrammetric for fieldwork. This poster aims to represent how the combination of photogrammetry, total station, and GIS document mortuary contexts in the most efficient manner, not only creating 3D models, but also georeferencing the entire context. We recovered two burials from the south room of the Guzmán Group's Structure GZ7, an outlying group of the El Palmar archaeological site, which is located in Campeche, Mexico. The results created 3D models of different burial layers as well as georeferenced drawings in ArcGIS.

**Ramon Celis, Pedro (Indiana University, Bloomington)**  
**[135]**

*Archaeology in the Southern Isthmus of Tehuantepec, Oaxaca: After a Century of Explorations, What Has Changed?*

This paper will be focused on understanding how archaeology has been practiced in different ways by different people in more than 100 years of explorations in the southern Isthmus of Tehuantepec, Oaxaca, Mexico. Also, who has produced information about the past in this region, and for whom, will be analyzed. What have been the significant shifts in the knowledge of this region, and what have been the major inquiries that archaeologists have researched here, and with which other scholars have engaged in dialogues and discussions, are crucial to address the nature of the information that we have available right now. The southern Isthmus of Tehuantepec is one of the regions that historically has been addressed as essential to explain the shifts in the social, economic, and political dynamics of Mesoamerica. Nonetheless, archaeological work has been relatively scarce in comparison with other places such as the northern Isthmus. Understanding how the information that we have about this region has been produced will help us to have a critical reading of data used by archaeologists in other areas.

**[135]**  
 Chair

Ramsden, Peter [103] see Rankin, Lisa

**Ramsey, James**  
**[65]**

*Bonfire Shelter: A Zooarchaeological Reevaluation of Bone Bed 2*

Bonfire Shelter is a rockshelter in Eagle Nest Canyon, a short tributary of the Rio Grande in West Texas, that contains three distinct bone beds of varying ages. The middle bone bed, Bone Bed 2, is a Paleoindian-aged deposit dating to ~12,000 years BP. Bone Bed 2 was originally interpreted as the remains of one or more bison mass kills; however, this interpretation has been heavily contested. Current investigations focus on the zooarchaeological findings of the ASWT Project's 2019 field season at Bonfire Shelter to reassess the accuracy of earlier interpretations. The bison assemblage was examined with respect to utility indices and butchering patterns to determine trends in carcass transport and utilization. Data collected from both current and previous excavations were combined in order to create an up-to-date age profile for the assemblage. These results will shed more light on the herd structure present in the assemblage and provide information on Paleoindian carcass processing strategies. The implications for site interpretation that arise when that data is integrated with the previous research are also discussed.

Randall, Asa [17] see Rainville, Charles

Ranhorn, Kathryn [40] see Hansen, Nicolas

**Rankin, Lisa (Memorial University) and Peter Ramsden (McMaster University)**

**[103]**

*Safe as Houses: Considerations of Domestic Arrangements and Power Structures*

In this presentation we each draw on our research in diverse societies to illustrate how house structure, layout, and use all participate in creating, signaling, and reinforcing power structures and relationships, both within and between households, and even between communities. Our geographical areas of research encompass southern Ontario's Kawartha Lakes (Ramsden) and the Far Northeast of Labrador (Rankin), but we both have a methodological and theoretical preoccupation with households as units of investigation and analysis. We find that the power-related functions of houses in both regions became amplified in times of political stress, ambiguity, or realignment. This was particularly notable in the protohistoric and early historic periods, in response to the appearance of brand new players on the political and economic landscape, namely Europeans. Attempts to accommodate these newcomers into preexisting cultural systems appear as a cascade of political and ethnic realignments, including shifts in power structures from the household to regional levels.

Rankle, Chad [89] see Borrero, Mario

**Ranum, Caleb (University of Alabama)**

**[15]**

*Plant Use in the Platform-Chamber Complex: A Paleoethnobotanical Study of Structure 1 at Alto Pukara, Taraco Peninsula, Lake Titicaca, Bolivia*

The site of Alto Pukara is located on the Bolivian Altiplano near Lake Titicaca. It dates to the Middle Formative, a period that witnessed the emergence of settlements, craft specialization, and hierarchical political development in the region. Excavations by Robin Beck in 2000 and 2001 uncovered two structures, which were identified as part of a platform-chamber complex constructed as a split-level platform. These were interpreted as belonging to two "houses" or extended family units—each structure was a ceremonial representation of one of these houses that tie the inhabitants with their ancestors this reinforcing the social order. During the excavations, sediment samples intended for the recovery of plant remains were systematically collected. In this poster presentation, I reconstruct the activities that took place within one of the structures by analyzing plant remains associated with its depositional history. This paleoethnobotanical approach reveals how the structure was used as part of daily life as well as the structure's symbolic and social significance to the residents of Alto Pukara.

Ranum, Caleb [5] see Hatcher, Lawford

**Rareshide, Elisabeth (University of California, Santa Barbara)**

**[64]**

*Chair*

**Rawski, Zoe (University of Texas, San Antonio)**

**[61]**

*Situating Early Xunantunich, Belize, in the Preclassic Landscape: A Synthetic Perspective from Structure F1*

Over the last five years, intensive investigations of Structure F1 at Early Xunantunich, Belize, have shed light on a dynamic and important time in the site's early history. The monumental platform structure played an important role in the early ceremonial center, creating the site's northern boundary, hosting large public rituals, and potentially bearing associations with the emergence of a royal dynasty at the site in the Late Preclassic period. In this paper, we present the results of recent analyses that situate the structure's history within a regional sociopolitical and economic context during the Middle and Late Preclassic periods. This context includes ceramic affiliations as well as other exchange networks of nonlocal materials such as obsidian, greenstone, and marine shell. Further, we synthesize the entire research program in light of these new findings, exploring the ways in which ritual performances in this space laid the foundation for increasing sociopolitical inequality during the Middle and Late Preclassic periods. These findings are further contextualized within the Early Xunantunich ceremonial center, as well as within the Preclassic Maya landscape more broadly. Finally, future directions are explored in order to identify how we might better understand this important early structure.

Ray, Erin [158] see Moyes, Holley

**Rayfield, Kristen (University of Oklahoma), Lushuang Huang (University of Oklahoma), Hayley Lanier (University of Oklahoma, Sam Noble Oklahoma Museum), Si Wu (University of Oklahoma) and Courtney Hofman (University of Oklahoma)**

[72]

*A Proteomic Approach to Determine Sex in Zooarchaeology*

Sex determination from animal skeletal remains can be challenging as it relies on sex specific bones or osteometrics. Determining sex is beneficial in understanding animal husbandry practices, as well as human-animal interactions. Building on previous work with humans, here we present a proteomic approach for determining sex from tooth enamel in nonhuman mammals. The protein amelogenin, which makes up 90% of the tooth enamel, is dimorphic and coded by the X and Y chromosomes. The protein products of the X and Y gene have been recovered in human tooth enamel and used to determine sex with the absence of the Y protein. This proteomic method has been shown to be less expensive and less destructive than genetic analysis from teeth, which has potential for allelic dropout. To evaluate this approach in nonhuman mammals, four mammalian species (dogs, coyotes, beavers, and deer) were tested in a blind study from research collections in the Sam Noble Oklahoma Museum of Natural History. Mass Spectrometry was applied to identify the amelogenin protein. We present here the findings of this experiment and further characterize species specific amelogenin proteins. Our research demonstrates how proteomic characterization of the amelogenin can be broadly applied to zooarchaeology.

Rayfield, Kristen [174] see Wright, Sterling

Raynal, Jean-Paul [77] see Fernandes, Paul

**Reamer, Justin (University of Pennsylvania)**

[52]

*"A River Runs through It": Reinterpreting Late Woodland Settlement Patterns in the Upper Delaware Valley*

Rivers are important natural boundary markers that, in modern contexts, commonly form political boundaries and, in archaeological contexts, are commonly used to delineate culture areas. In eastern North America, river drainages are often used for both purposes, which has impacted how archaeologists interpret the archaeological record. In the history of the discipline, many archaeologists have defined where they work by both the local river drainage. But commonly these archaeologists have only excavated in one state, and thus, when working in a river drainage separating states, only on one side of the valley. In this paper, I will examine how this practice of only working on one side of a river valley has influenced archaeological interpretations and fueled intra-regional debates. Specifically, I will focus on how archaeologists working in the Upper Delaware Valley have reached different conclusions about settlement patterns during the Late Woodland by drawing their data only from sites in either Pennsylvania or New Jersey. Using feature data from sites on both the eastern and western banks of the Delaware River from sites in the Minisink National Historic Landmark, I will examine how different locations were being utilized and what this implies about settlement patterns during the Late Woodland.

**Reaux, Derek (University of Nevada, Reno)**

[95]

*Western Stemmed Tradition Lithic Procurement Strategies at the Catnip Creek Delta, Locality, Guano Valley, Oregon: A Gravity Model Approach*

Source provenance analyses have long featured prominently in Great Basin Paleoindian archaeology. Such research has primarily focused on reconstructing Paleoindian settlement/subsistence strategies, territoriality, and socioeconomic interactions by sourcing obsidian artifacts from sites and mapping their geographic distributions. While these studies have identified the toolstone sources that early groups used and how they may have conveyed them, few have explicitly addressed why particular materials may have been selected. I present a gravity model that examines the influence of geologic and geographic factors (e.g., toolstone quality and abundance) on Western Stemmed Tradition lithic procurement strategies at the Catnip Creek Delta Locality, Guano Valley, Oregon. My results suggest that groups primarily procured toolstone based on its proximity to wetlands and travel corridors and not sources' overall quality. Paleoindians may have done this to maximize foraging efficiency within a wetland focused and residually mobile settlement-subsistence system.

[95]

*Chair*

**Redding, Richard (Kelsey Museum, University of Michigan)**

[129]

*The Animal Subsistence System of Old Kingdom of Egypt*

Excavations in various functional areas of the Workers' Town and other settlement sites at Giza, Egypt, have provided a nuanced understanding of the distribution of animal taxa and body parts to dependents of the king. The residents of most of the areas excavated consumed sheep, goat, cattle, various birds, and fish. Young cattle and Nile perch were consumed by the higher ranked individuals while sheep-goats and Nile catfish were the diet of the lower ranking individuals. But, curiously, even in areas of the site occupied by low ranking individuals (e.g., the barracks) cattle bones are found. The cattle elements in the barracks are all distal foot elements; metapodials, podials, and phalanges. These foot elements were used to make a stew—known in Egypt today as *shorbet kawara*—that is high in calories and nutritionally perfect for supporting intensive labor. Symmetry and limb biases have also been identified that suggest offerings were primarily forelimbs and from the right side. Together, these patterns suggest a centrally

organized, highly efficient distributive system that extended to the organization of production and transport.

[129]

Chair

**Rees, James (Arkansas Archeological Society)**

[84]

*Searching for the Missing Drum: The Evidence for the Presence and Ceremonial Importance of Ceramic Vessel Drums in the Prehistoric Southeastern United States*

Early historical accounts suggest that drums played an important role in the ceremonial life of the prehistoric southeastern United States. However, because they were made in whole or in part of ephemeral materials, drums are virtually invisible in the archaeological record. Interestingly, historical records, ethnographic information, and iconographic imagery from Spiro and other southeastern sites all point to one particular form of ceramic vessel drum as being present in prehistoric times. This study focuses on how these drums fit into the cosmic symbolism of the Mississippian culture and suggests some possible techniques to distinguish them from other similar vessel forms in existing archaeological collections.

Reese, Kelsey [35] see Bergman, Stephanie

Reese, Kelsey [26] see Portman, Katherine

Reich, David [55] see Nakatsuka, Nathan

Reich, David [55] see Nores, Rodrigo

Reich, David [55] see Owsley, Douglas

Reich, David [55] see Punzo Díaz, José Luis

**Reid, David (University of Illinois, Chicago)**

[147]

*Dating a Wari D-Shaped Temple: New Radiocarbon Evidence from Pakaytambo, Arequipa, Peru*

The Middle Horizon (AD 600–1000) was a time of profound social transformation in the Andes, distinguished in part by the expansion of Wari influence, peoples, and state institutions outside of their Ayacucho heartland. In this paper, I present findings of an architectural complex composed of Wari patio-groups, a D-shaped structure, and monumental platform construction at the site Pakaytambo in southern Peru (upper Majes Valley, Arequipa). Analysis of excavated material remains and AMS radiocarbon dates indicate that this Wari occupation occurred sometime between the late eighth and tenth centuries AD. Here I report initial findings and draw similarities to other D-shaped enclosures at Wari sites across Peru. Pakaytambo's strategic location along the valley's major prehistoric road and its placement between local populations in the upper drainage and middle Majes Valley would have framed interactions with local populations. Consequently, Pakaytambo provides an ideal perspective on the use of ideology as state power in a frontier context.

Reid, David [38] see Monaghan, John

**Reilly, Frank (Texas State University)**

[51]

Discussant

**Reilly, Frank (Texas State University)**

[120]

*From Cave Mouth To Temple Door*

I suggest that at some point in the development of the Braden art style that the 3D flint-clay statuettes (AD 1100–1175) take the place of the earlier Braden-style paintings (AD 900–1000) found in caves and rockshelters, while temples (BBB Motor Site) that house the flint-clay statuettes substitute for the caves that housed the earlier paintings. Thus, the images carried by the Braden style become renditions of preternatural anthropomorphic and animal figures as well as several categories of symbols, while the temples substitute for the caves that appear to be the natal point of the style.

[120]

Chair

**Reilly, Sophie (Northwestern University) and Andrew Roddick (McMaster University)**

[182]

*A Taste for Tubers: The Circulation of the Familiar through the Ancient Titicaca Basin*

Archaeologists track the social, political, and economic dynamics of the ancient Lake Titicaca basin through the circulation of people and things. Plant things, in particular, reveal food choices, quotidian diets and special meals, and broader trade relations before and after the settling of the urban center of Tiwanaku. In this paper, we discuss paleoethnobotanical work at two settlements with Late Formative and Tiwanaku occupations. We present new evidence for lowland tubers (yuca, sweet potato, arrowroot) from the recently excavated site of Challapata in the eastern Titicaca basin and the well-known southern basin site Chiripa. We consider these nonlocal food findings in the context of local tubers, such as potato, oca, and ulluco. Why would Titicaca tuber growers wish to acquire lowland tubers as well? We suggest that these nonlocal plants were desirable because of a particular local taste for tubers and extant knowledge of tuber cooking techniques. Titicaca Basin communities chose their food (and cultivated trade relations) due

to particular tastes and food familiarity, not simply for exotic flavors. We suggest the need for further attention to such choices, particularly over periods where not just social and political orders were changing, but likely larger sensory worlds associated with food choice.

Reilly, Sophie [136] see Emery, Kitty  
Reilly, Sophie [156] see Logan, Amanda

Reinhart, David [100] see Bandy, Matthew

**Renaud, Jared (University of Arizona)**

[25]

*Anticipating Changing Heritage Values: Reevaluating Priority Cultural Resources Criteria in Pima County, Arizona*

**[WITHDRAWN]**

Ressel, Christian [93] see Piezonka, Henny

Reyes Lezama, Marisol [133] see Velasco Fuentes, Rocio

**Reynolds, Robert, Thomas Palazzolo (Wayne State University), Ashley Lemke (University of Texas, Arlington), John O'Shea (University of Michigan, Ann Arbor) and Sarah Saad (Wayne State University)**

[52]

*Deepdive: Using AI and Virtual Reality to Explore Ancient Submerged Civilizations*

Submerged Prehistoric Archaeology is a subdiscipline of archaeology that deals with the discovery of ancient submerged landscapes. In Europe alone over 3,000 submerged ancient sites are recorded. While there is an increased number of submerged sites in North America, the emphasis has been on the study of shipwrecks and historical questions related to nautical issues. As a result, underwater archaeology has not contributed much to anthropological theory there, especially when it comes to broader theoretical issues. The goal of this study is to use artificial intelligence techniques, machine learning, and virtual reality to re-create an ancient submerged landscape. This landscape is then used as a vehicle for archaeologists to test theories and validate hypotheses about ancient civilizations. Ultimately, the goal is to predict the location of new underwater sites that can be examined archaeologically. The specific project, the Alpena-Amberly Land Bridge Project, is located in Lake Huron, one the Great Lakes in North America.

**Rezek, Zeljko (Max Planck Institute for Evolutionary Anthropology)**

[58]

*Chair*

**Ricci, Giulia (Laboratoire méditerranéen de préhistoire Europe Afrique), Aurore Val (Abteilung für Ältere Urgeschichte und Quartärökolo) and Guillaume Porraz (Laboratoire méditerranéen de préhistoire Europe Afrique)**

[151]

*The Technological Sequence of Heuningneskrans (Limpopo, South Africa) around the Time of the Last Glacial Maximum*

The southern African region comprises a mosaic of biomes influenced by various physical and atmospheric parameters. Pleistocene hunter-gatherer societies would have exploited those biomes differently, which would have contributed to generate different lithic assemblages and traditions. The opposition between the coast and the veld is often regarded as one main dialectic that contributes to explain the technological variability across the landscape. Other oppositions have also been proposed, relating for instance to the distribution of raw materials. In this paper, we focus on a recently excavated lithic assemblage from Heuningneskrans in Limpopo Province (South Africa) and initiate a discussion on the Robberg techno-typological expressions in South Africa with regard to (1) space (inland and coast), (2) time (around the Last Glacial Maximum), and (3) geo-resources distribution (raw materials).

**Rich, Michelle (Dallas Museum of Art, Art of the Americas), Matthew Robb (Fowler Museum at UCLA) and David Freidel (Washington University in St. Louis)**

[51]

*Jade Faces: Heirlooms and Emulations in Olmec and Maya Art*

From the colossal heads of the Olmec to the severed head of the Maya Maize God in the Popol Vuh, the head and face have been of singular importance in Mesoamerican art and thought. If the human body is an axis mundi, the head and face give that axis a physical manifestation of individuality. A nexus of thought and emotion, the head and face provide a bodily armature for personal identification and royal regalia such as headdresses and diadem jewels. In this presentation, we follow in the rich tradition of F. Kent Reilly's examinations of Olmec iconography that link site planning to objects from archaeological contexts and museum collections through bold conjecture resulting in coherent models of royal power and performance. We draw on some of Reilly's myriad observations in order to construct a narrative weaving together cosmograms, metaphorical links between heads and seeds, and the use of heirloom objects in ancient Mesoamerica.

**Richards-Rissetto, Heather (University of Nebraska, Lincoln)**

[56]

*Discussant*

**Richards-Rissetto, Heather (University of Nebraska, Lincoln), Kristy Primeau (SUNY, University at Albany) and David Witt (SUNY, University at Buffalo)**

[176]

*Incorporating Vegetation Reconstruction in Computational Landscape Archaeoacoustics: An Ancient Maya Case Study*

The Ancient Maya perceived settlements as *kahkab*, or “populated earth”; that is, urban agrarian places where residences intermixed with gardens and orchards. In previous work, we simulated the late eighth- and early ninth-century landscape of the ancient Maya city of Copán to investigate multisensory experience. Building on this work, we now refine the landscape reconstruction to explore the impacts of vegetation on what was seen and heard through the incorporation of paleoenvironmental data, ethnobotanical data, and remote sensing. Using the Variable Cover Type Soundshed Analysis tool in the Archaeoacoustics GIS toolbox, we perform computational analysis to generate soundsheds and a digital surface model to generate viewsheds for several of Copán’s valley stelae, exploring how vegetation may have impacted the experience of rituals conducted at these locations.

**Richter, Kim (Getty Research Institute)**

[107]

*The “Tamtoc Venus”: An Early Huastec Sculpture and Its Connections to Gulf Coast Sculptural Traditions*

Although the Huasteca belongs to the Mesoamerican culture area and the Gulf Coast region, some scholars have asserted that its culture, emblemized by its sculptural tradition, was isolated. The examination of Huastec stone sculptures from different periods reveals not only its links to other artistic traditions in Mesoamerica but significantly also to other Gulf Coast sculptural traditions. Another misconception is that the sculptural tradition flourished during the Postclassic period. The discovery of sculptures from earlier periods at the site of Tamtoc in the heart of the Huasteca counters this misconception. This presentation will analyze the earliest Huastec sculpture known to date: the fragmented scarified female sculpture discovered in an offering below Monument 32 at Tamtoc, sometimes called “Tamtoc Venus” for its voluptuous, naturalistic body. I will propose an estimated period of manufacture based on artistic criteria and place the sculpture in its art-historical context, relating it both to local traditions of clay figurines and broader regional traditions of Gulf Coast sculpture.

**Richter, Kim (Getty Research Institute)**

[122]

*Chair*

**Richter, Kim (Getty Research Institute)**

[180]

*Discussant*

Rick, Torben [91] see Wellman, Hannah

Ricker, Matthew [152] see Marken, Damien

**Ricketts, Macy (University of Wyoming), Naomi Ward (University of Wyoming), Todd Surovell (University of Wyoming) and Madeline Mackie (University of Wyoming)**

[28]

*Evaluating Potential Time Signatures within Extant Microbial Communities in Stratified Soils at the La Prele Mammoth Site*

Recent studies of microbial communities in terrestrial environments have shown that an input of environmental “triggers” within soil substrate can activate dormant soil microorganisms. Additionally, deep within marine coal deposits, it has been discovered that forest soil microbes thrive, despite their oceanic surroundings. However, terrestrial microbial communities have also been shown to be strongly shaped by both biotic and abiotic factors in their present environment. Within archaeological soils, the relationship of extant microbial communities to both past and present environmental conditions is poorly understood. One study tested microbial communities’ ability to indicate past climate aridity at a coarse taxonomic level, but further study was needed in order to draw conclusions. In this study, we analyzed soil samples collected from a sediment profile at the La Prele Mammoth kill site near Douglas, Wyoming using 16S rRNA marker gene analysis, radiocarbon dating, pH, electrical conductivity, and past and present climate measurements. Ordination of these measurements and microbial communities showed that soil depth, soil age, and current temperature of the soil all played significant roles in determining microbial community composition, suggesting that microbial community abundance and distribution are influenced by both past and present environmental factors.

Riel-Salvatore, Julien [28] see Brun, Catherine

Riera-Soto, Camila [125] see Uribe, Mauricio

Rieth, Christina [144] see Herr, Sarah

**Rieth, Timothy (IARII), Robert DiNapoli (Binghamton University), Anthony Krus (University of South Dakota) and Derek Hamilton (University of Glasgow)**

**[130]**

*Multiscalar Island Colonization Estimates through Bayesian Calibration Models*

**[WITHDRAWN]**

**Rieth, Timothy (IARII)**

**[164]**

*Discussant*

**Riley, Tim (Prehistoric Museum @ USU Eastern)**

**[110]**

*Discussant*

**Riley, Tim (Prehistoric Museum @ USU Eastern) and Katy Corneli (Prehistoric Museum @ USU Eastern)**

**[133]**

*Animal, Vegetable, Mineral? The Characterization of "Resins" Binding Composite Artifacts from the Northern Colorado Plateau*

Like many museums across the American West, the Utah State University Eastern Prehistoric Museum houses a collection containing well-preserved perishable objects. Many of these artifacts incorporate organic binders, such as hafted arrows and pitched containers. Yet scant attention has been given in the literature to the use of resins as the glue that held life together. Studies across the Southwest and beyond show a surprising diversity of binders, including insect lac and asphaltum as well as plant exudates, were used on artifacts. This presentation highlights work done to characterize the sources of these binders and to recover data that might reflect artifact use. Borne from an attempt to evaluate the presence of modern replicas or pastiches within private collections, this study involved plant harvesting and artifact replication experiments, visual and microchemical tests, and microscopic identification of trapped components. A secondary component of this study was the recovery of use-wear residue accumulated in the resinous matrix. The microscopic materials trapped in the patch of a ceramic cooking pot or hafted scraper can provide valuable insight into artifacts with limited provenience, shining new light on old collections.

**Rincon Mautner, Carlos**

**[102]**

*Discussant*

**Rincon Mautner, Carlos**

**[154]**

*Toward an Ideology of Mesoamerican Ritual Sacrifice: An Interdisciplinary Approach*

As a cultural adaptive strategy, ritual sacrifice throughout Mesoamerica has had multiple purposes including providing a sense of control over the forces of nature aimed at attaining desired outcomes, especially those related to agricultural production. When human sacrifice was involved, such rituals and ceremonies also were agents of social control, eliminating competitive rivalry through fear and intimidation, contributing to the stratification of society, perpetuating the inheritance of noble estates, and maintaining hierarchical rank of lineage members. Considered within the context of obligatory reciprocity, it becomes easier to appreciate and understand the significance of human sacrifice as common practice among different societies since time immemorial by providing a venue for elites to assert their power and dominance over other noble houses and commoners. This paper examines data from southern Mexico that, when compared to other Mesoamerican regions, strongly suggest the existence of a shared ideology regarding ritual sacrifice that cuts across space, time, and ethnic identity.

**Ringle, William (Davidson College, Emeritus)**

**[132]**

*Discussant*

Riquelme, Rodrigo [68] see de Souza, Patricio

Risner, Lacy [122] see Venter, Marcie

**Rissolo, Dominique (University of California, San Diego)**

**[98]**

*An Overview and Synthesis of Paleocoastal Research on the Yucatán Peninsula*

The broad carbonate platform and shallow continental shelf of the Yucatán Peninsula supported the rise of the northern lowland Maya and the dispersal of Paleoamerican peoples thousands of years earlier. Exploration—particularly in the region's now-submerged cave systems—has revealed the remains of the Yucatán's earliest human inhabitants as well as diverse and relatively well preserved faunal and botanical assemblages. Additionally, growing interest in Maya maritime trade and interaction has necessitated a more holistic understanding of the interrelationships between humans and coastal processes, particularly in zones of low topographic relief. Over the past two decades, interdisciplinary research programs have more intensively focused on Late Pleistocene through Late Holocene sea level rise—and its implications—via a range of methodologies and proxies. Efforts have involved the recovery and analysis of cave and shallow marine sediment cores, speleothems, and sub-bottom sonar data in addition

to detailed mapping and in situ geological and paleontological sampling. The resulting reconstructions of paleoclimate, paleoecology, and overall paleocoastal geomorphology have proven integral to ongoing archaeological investigations on the Yucatán Peninsula.

**Ritchison, Brandon (University of Illinois, Urbana-Champaign) and Matthew Davidson (US Forest Service, Daniel Boone National Forest)**

[130]

*Modeling Fort Ancient: Legacy Data and Pathways to Improving Chronology in Late Precolonial Kentucky*

Ceramic- and lithic-based phase-level chronologies, built on assumptions of gradual change over time, have traditionally comprised the foundation of archaeological reconstructions. Recent reevaluations of long-standing regional chronologies, often based on pre-AMS radiocarbon dates and the presence or absence of presumed "index fossil" artifacts, can be made considerably more accurate, as well as more sensitive to changes across short spans of time, through expanded, problem-oriented AMS dating programs. In the Middle Ohio River Valley, Fort Ancient chronologies suffer from poor radiocarbon hygiene, a limited number of dates, and uneven geographic representation. In this paper, we present the preliminary results of an effort to refine the southwestern Fort Ancient chronology using a combination of legacy dates and Bayesian chronological modeling. Our results demonstrate that Fort Ancient chronologies are in need of revision, primarily through the creation of an expanded, modern radiocarbon dataset. We additionally discuss the results of associated simulated models to identify the chronometric data that will be required going forward that will be needed to examine the underlying social processes at play in the rapid social transformations that were occurring throughout the Eastern Woodlands during the eleventh through the seventeenth centuries.

**Ritter, Alexandra (Western Washington University), Paloma Cuello del Pozo (Texas A&M University) and José Peña (University of Arizona)**

[14]

*Preliminary Study of Dental Health among Coastal Population at the Site of the Santo Domingo Cemetery in Huarmey, Peru*

Recent archaeological excavations at the prehispanic cemetery of Santo Domingo in Huarmey (Peru) suggest that it was associated with the settlement of El Campanario. Based on the ceramic styles recovered at the site, the cemetery was likely utilized during the second half of the Middle Horizon (AD 800–1000) and the Late Intermediate period (AD 1000–1400). In a preliminary attempt, the juvenile and adult mandibles and maxillae of 13 individuals were examined to suggest dietary and cultural practices exercised by this population. Common pathologies observed were alveolar resorption, severe crown wear, root caries on the buccal side, pit caries on the occlusal side, and alveolar abscesses. Given the small sample size, statistically significant claims regarding lifestyle and dietary habits cannot be made without further research. However, it is hypothesized that some of the dental markers observed are related to the practice of coca chewing, along with the effects of specific dietary habits generated from the population's coastal and agricultural resources. To determine if coca chewing was a practice exercised by individuals recovered from the site, the protocol outlined by Indriati and Buikstra (2001) will be applied in future examinations.

Rivera, Ivan [155] see Davila, Carol

Rivera, Jordi [159] see Sutter, Richard

**Rivera-Collazo, Isabel (University of California, San Diego) and Mariela Declet Perez (University of California, San Diego)**

[68]

*Cultural Heritage and Climate Action: The DUNAS Project*

The climate crisis is a social issue, and social sciences are needed to understand and address it. Archaeology has recognized that it stands in an unparalleled position to contribute to the climate conversation because (1) it has thousands of years of recorded climate change coupled with human response, (2) it can help to understand the nuances of risk in the present and identify traditional solutions and outcomes of response, and (3) it can inspire and support climate action. However, climate change also poses a threat to the preservation of the archaeological record. This presentation shares the DUNAS project (Descendants United for Nature, Adaptation, and Sustainability) in Puerto Rico as an example of a co-produced endeavor that combines archaeology, ecosystem restoration, and climate change research to inspire action and to mitigate climate impacts. The goals of DUNAS are to restore natural ecosystems impacted by Hurricane Maria, to protect cultural heritage and to support resilient communities. Cultural heritage can help move the conversation and raise ambition to mitigate climate change because losing heritage is losing ourselves. We are facing climate change now, not in the future. Cultural heritage and archaeological sites can contribute to identifying solutions now, in preparation for the future.

[68]

*Chair*

Rivera-Collazo, Isabel [68] see Cantu, Katrina

Rivera-Collazo, Isabel [1] see Morris, Margaret

Rivera Infante, Arturo [16] see Corcoran-Tadd, Noa



**Rivera Prince, Jordi (University of Florida) and Gabriel Prieto (University of Florida)****[159]***A "Salinar Period" Cemetery at the José Olaya Site: Preliminary Demography of a Post-Chavín Maritime Community in the Moche Valley*

Systematic bioarchaeological studies of skeletal remains in conjunction with mortuary analyses provide a unique space in which archaeologists can begin to reconstruct past populations, social dynamics, and cosmologies. Following the influence of late Initial period Cupisnique (1200/1100–500 BC) and early Horizon Chavín (800–400 BC), north coast populations entered a period of transition. The beginning of this period, the "Salinar period" (ca. 400 BC–100/50 BC) is poorly understood in the context of the Moche Valley in northern Peru more broadly. Three years of excavations by the Programa Arqueológico Huanchaco (PAHUAN) at the José Olaya site in Huanchaco (approximately 10 km north of modern-day Trujillo) identified three Salinar period occupations. While human remains are associated with all occupations, the identification of a cemetery means the José Olaya site has become the largest systematically excavated Salinar period cemetery since rescue excavations at Cerro Oreja (Moche Valley) and the Puémape site (Jequetepeque Valley). To date, many burials have been recovered from José Olaya and some preliminarily analyzed. Preliminary demographic information will be presented, with particular focus on elite burials identified thus far. Considering data-derived mortuary patterns, bioprofiles, and cemetery-wide trends, this paper discusses potential theoretical implications in a post-Chavín coastal Moche Valley.

**[159]***Chair*

Rizzo, Adriana [133] see DeLeonardis, Lisa

**Roa, Ian (University of Pittsburgh), John Walden (University of Pittsburgh), Michael Biggie (Los Angeles Maritime Institute), Gavin Wisner (Northern Arizona University) and Rafael Guerra (University of New Mexico)****[23]***Reconstructing Diachronic Changes in Subsistence, Wealth, and Economic and Ritual Practices through Animal Use at the Classic Maya Polity of Lower Dover, Belize*

Maya archaeologists have traditionally used faunal analyses to examine questions about subsistence and ritual practices. We chart diachronic changes in patterns of faunal usage pertaining to four sociocultural dimensions: consumption, economic productions, wealth, and ritual at three districts surrounding the Late Classic (AD 600–900) Maya political center of Lower Dover, Belize. These categories provide heuristic categories that allow us to examine statistical trends in animal use over time. In this study, we draw diachronic comparisons between early autonomous villages during the Middle Preclassic (900–300 BC), their growth in the Late Preclassic through the Early Classic periods (300 BC–AD 600), and their incorporation as districts in the Lower Dover polity during the Late Classic. Results indicate disparities in access to specific animals based on wealth and status, variability in subsistence between different districts, and the ritualized use of animals in elite-hosted ceremonies in the construction of specific district-scale social identities. The analyses reveal that as the Lower Dover polity emerged, animal resources were one of the many sociopolitical tools which intermediate elites used to express status and bolster district-scale cohesion.

**Robb, Matthew (Fowler Museum @ UCLA)****[101]***Discussant*

Robb, Matthew [51] see Rich, Michelle

Roberts, Patrick [72] see Samec, Celeste

Robertson, Ian [104] see Nichols, Deborah

**Robin, Cynthia (Northwestern University)****[181]***Discussant***Robinson, Erick (Utah State University) and Judson Finley (Utah State University)****[130]***Developing High-Precision Chronologies for Fremont Foraging-Farming Transitions in Western North America*

Fremont societies represent the northernmost adoption of agriculture in Western North America. Research on the Fremont provides one of the few opportunities in the world to understand the processes behind both the adoption and the abandonment of agriculture. Decades of research have illustrated how variability is a hallmark of Fremont societies. Understanding variability in Fremont societies requires the development of high-precision chronologies that enable researchers to break down region-wide processes into their various site-specific components. This paper explores the potential for developing high-precision chronologies in Fremont research. We focus specifically on the northeastern-most distribution of Fremont societies. Results indicate challenges provided by the large numbers of low resolution radiocarbon samples currently available to researchers, and the need for new high-precision samples in order to fully understand the processes behind Fremont variability and the conditions that led to the adoption and eventual abandonment of agriculture. We argue that the importance of Fremont research for understanding the adoption and

abandonment of agriculture is diminished by sole reliance on coarse-grained, low-resolution chronologies.

Robinson, Erick [39] see Thomas, David

Robinson, Erick [7] see Tucker, Kaley

**Robledo, Angelo (University of Nevada, Las Vegas), Alan Farahani (University of Nevada, Las Vegas) and Bruce Routledge (University of Liverpool)**

[29]

*Change and Adaptation in Stone Tool Technology in Jordan ca. 1000 BCE*

[WITHDRAWN]

**Robles García, Nelly (INAH)**

[82]

*Análisis arquitectónico del conjunto Patio Hundido y sus estructuras compuestas: Edificios A y B de Monte Albán*

Los recientes trabajos de restauración arquitectónica en Monte Albán, resultantes de los sismos de 2017, nos han hecho replantear las intervenciones realizadas por el Proyecto Especial 1992–1994. En particular, encontramos que los deterioros causados por los sismos en el Edificio A fueron exacerbados por intervenciones de esa época, en las que se abusó del uso del cemento y la reconstrucción innecesaria. Un análisis espacial basado en el principio de la simetría, y las excavaciones realizadas en el edificio A, nos llevan a plantear una lectura del conjunto del Patio Hundido, en el que los Edificios A y B son el eje del desarrollo de un concepto arquitectónico de estructuras “compuestas”, que no había sido advertido hasta ahora.

[82]

*Chair*

**Robles García, Nelly (INAH)**

[135]

*Discussant*

Robles García, Nelly [82] see Frykholm, Soren

Robles García, Nelly [82] see García, Dante

Robles García, Nelly [82] see García Lalo, Luis

**Rocha, Bruna (Universidade Federal do Oeste do Pará, Brazil), Vinicius Honorato (Universidade Federal do Oeste do Pará, Brazil), Márcio Amaral (Instituto Mamirauá) and William Balée**

[66]

*The Pristine Myth and Its Consequences for Amazonian Forest Peoples: An Example From the Upper Iriri*

Located in the Xingu-Tapajós interfluvium, the Terra do Meio is currently made up of a mosaic of protected areas and Indigenous reserves. This case study considers the relationship between the riverine traditional communities (who call themselves *beiradeiros*) of the upper Iriri River and the Brazilian state, from the time when the area they inhabit since the late nineteenth century was decreed an Ecological Station—a modality of conservation unit that prohibits human occupation. Based on the “pristine myth”—the notion that the environment should be totally protected/preserved—these *beiradeiros* have been pressured, at times violently, to leave the area. This paper will present recently acquired data, produced by work integrated through a historical ecological perspective, that relates to the antiquity of human occupation of the *beiradeiro*'s territory and the relationship between these “recent” inhabitants with an ecological infrastructure built by past occupants that its current occupants manage and promote.

**Roche Recinos, Alejandra (Brown University), Andrew Scherer (Brown University) and Charles Golden (Brandeis University)**

[136]

*Stone Goods and the Organization of Late Classic Period Regional Economies of the Middle Usumacinta River Region*

In this paper we present the results of the analysis of nearly 42,000 chert and obsidian artifacts from sites in the Middle Usumacinta River region to examine economic production and exchange at the level of the polity. Our study includes a range of household and non-household contexts, revealing entanglements of the lithic economy within the sociopolitical dynamics of the region during the Late Classic period (AD 600–900). The urban center of Piedras Negras demonstrates a remarkable paucity of long-distance trade goods (e.g., obsidian and greenstone), relative to Yaxchilan, Palenque, and other neighboring polity capitals. Yet, Piedras Negras's subsidiary, Budsilha, enjoyed better access to some of these same goods, likely resulting from the economic networks surrounding an obsidian workshop found at that site. The craftspeople at Budsilha produced far more blades than were consumed at the site itself, suggesting that they were among the major producers in the area. Coupled with other lines of archaeological evidence, these data point to the complicated nature of Maya economies where economic productivity and trade connections were not equally held among polity capitals and subordinate centers may have enjoyed greater economic opportunity than the polity capitals that governed them.

**Rockman, Marcy (ICOMOS)**

[113]

*Discussant*

Rodas, Ricardo [132] see Sion, Julien

**Roddick, Andrew (McMaster University) and Erik Marsh (CONICET)**

[45]

*What Was Tiwanaku, Really?*

More than 30 years ago, Garth Bawden wrote a prescient review on the "Andean State as a State of Mind." He critiqued Andean scholars for focusing on the state as an analytical unit. He complained that much good scholarship was being ruined due to the "albatross of the state," and urged further attention to the subtle changes that impacted all aspects of society. In this paper, we review the "state of affairs," reflecting on data from both Tiwanaku and earlier Formative contexts. An explosion of research over the past 20 years has undermined many earlier "Visions of Tiwanaku"; in fact, the very nature of the Horizon has been compressed by several generations. These findings underscore the need for a new narrative for the Titicaca basin phenomena. We discuss the chronological bounding, the nature of Tiwanaku identity, and broader landscape data to critically engage recent models to Tiwanaku and broader approaches to complex political assemblages to ask, what was Tiwanaku, really?

[45]

Chair

**Roddick, Andrew (McMaster University)**

[106]

Discussant

Roddick, Andrew [182] see Reilly, Sophie

**Rodning, Christopher (Tulane University) and Stephen Acabado (University of California, Los Angeles)**

[147]

*Game Theory, Chaos Theory, and the Archaeology of Indigenous Responses to Global Spanish Colonialisms*

Dominant historical narratives have favored interpretations that conquered groups yielded to the political and economic might of colonizing powers. Recent models in archaeology, however, emphasize that indigenous responses to colonialism are more complex than succumbing or capitulating to colonial and imperial hegemony, and that indigenous peoples significantly shaped the historical courses of culture contact. This paper considers the applicability of game theory and chaos theory toward explaining indigenous engagements with Spanish colonists in the Philippines and the Native American South. These cases offer examples of indigenous groups making decisions and pursuing strategies meant to ensure that local communities would both survive and thrive in changing geopolitical landscapes, including cases in which groups resisted or accommodated colonial enterprises, or both at once. For example, the Ifugao of the Philippines shifted from dry-rice to wet-rice cultivation after Spanish contact. Although the Spanish colonial regime favored wet-rice cultivation, this practice generated monetary power and political capital for the Ifugao, and enabled successful resistance by the Ifugao to Spanish colonial hegemony. Archaeological and historical sources illustrate that Native American groups navigated and managed the Spanish colonial presence in the American South within indigenous frameworks of warfare and diplomacy, trade and exchange, and monumentality.

**Rodriguez, Katherine and Nicholas Herrmann (Texas State University)**

[32]

*Applying Geophysical Prospection to Interpret Historical Burial Practices at Two Cemeteries on St. Eustatius, Dutch Caribbean*

This research examines the relationship between the Old Church Cemetery and the Jewish Cemetery on the Dutch Caribbean island of Sint Eustatius. These cemeteries are located near each other, yet the people buried in them had different religious ideologies and social positions. Utilizing ground-penetrating radar and gradiometry, I searched for unmarked burials for a more accurate representation of the cemeteries while they were in use to analyze the cultural relationship between the Dutch Reformed and the Jewish community in the late seventeenth and eighteenth centuries. In ArcGIS, possible grave anomalies were identified, and the dimensions of extant and possible burials measured. This narrowed down what anomalies could be a burial based on the dimensions of the anomaly. Anomalies that persist throughout the GPR grids or match historical maps were identified as burials. The data suggest potential unmarked burials in the Old Church Cemetery and the Jewish Cemetery. The marked Jewish burials orient northwest to southeast and the marked Dutch Reformed burials orient east to west. Differences in dimensions of extant burials were detected by *t*-test. These results suggest evidence of different cultural traditions and will be researched further.

Rodríguez-Álvarez, Xosé Pedro [53] see Fábregas Valcarce, Ramón

Rodríguez-Álvarez, Xosé Pedro [140] see de Lombera-Hermida, Arturo

**Rodríguez-Delgado, Eric (UC San Diego)**

[195]

*Dynamic Coastlines: Modeling the Impacts of the Intertidal Zone Transformation for Puerto Rico during the Mid- to Late Holocene*

As Caribbean research engages in the study of past human-environmental relations, few efforts have focused on the reconstruction of the dynamic intertidal zone and its impacts on past food security and livelihood. Interdisciplinary approaches can address this gap as these paleogeographic and paleoclimatic reconstructions contribute an understanding of coastal conditions that may have influenced resource and habitat availability. Using recent glacial-isostatic adjustment modeling of Holocene sea level rise and high resolution topobathymetric datasets, this paper presents new 1,000-year interval models of the intertidal zone of Puerto Rico from 10–1 kya and discusses their significance alongside recent findings in pre-colonial archaeology. By demonstrating the varying degrees of intertidal zone transformations across six distinct coastlines, this study argues for the consideration of the differential

impacts that Holocene sea level rise had across the island and its past resourcing strategies.

[195]

Chair

Rodríguez-Pascua, Miguel Ángel [89] see Combey, Andy

Rodríguez-Saza, Freddy [178] see Fitzgerald-Bernal, Carlos

**Rogers, Thatcher (University of New Mexico)**

[166]

*Complexity, Rituality, and the Origins of Paquimé (Casas Grandes), Chihuahua*

Archaeological investigations in the prehispanic American Southwest/Northwest Mexico region have provided rich insight into the development of sociopolitically complex polities in the Phoenix Basin, Chaco Canyon, Rio Grande valley, and northwestern Chihuahua. In all of these places, sociopolitical complexity is linked to the development of and elite control over key ritual practices and spaces. One of these locations, Paquimé (also called Casas Grandes located in northwestern Chihuahua) has received far less discourse, even though it was one of the largest and most socially complex sites in the region. Over the past two decades, several competing models relating complexity at Paquimé to forms of ritual practice have been proposed yet limited independent evaluation has occurred. In this paper, I assess these models and investigate supporting data to address three research questions: When did rituality and complexity become integrally tied in Casas Grandes society? Are there specific ritualized spaces indicative of this linkage? And what were the outcomes of this process for the broader populace? The investigation of these questions evaluates conflicting hypotheses, enables a more accurate understanding of how Paquimé developed, and poses productive avenues for future investigations in prehispanic Southwest complexity.

**Rolett, Barry (University of Hawai'i, Manoa)**

[97]

*From Dune Stratigraphy to a Model-Based Cultural Sequence for the Marquesas Islands of East Polynesia*

The Marquesas Islands comprise part of East Polynesia, a culture area that also includes Hawai'i, New Zealand, and Tahiti. Calcareous sand dunes are rare in the Marquesas but play an outsized role in Polynesian archaeology. Dune sites yield remarkably rich evidence of human settlement and the preservation of organic remains is unparalleled. Yet the stratigraphy of these sites is complex. Drawing on results from the excavation of key Marquesan dune sites (Hanamiai, Ha'atuatua, and Hane), this presentation examines the value of biomarkers and chronologically diagnostic artifacts in constructing chronological models. Prominent markers, such as the remains of extinct fauna, allow the correlation of stratigraphic sequences within and among sites. A two-phase cultural sequence is defined, consisting of the Archaic and Classic eras. The Archaic era, representing initial human colonization and a period during which distant communities were linked by systematic long-distance voyaging, is particularly significant because its defining traits are widely distributed across East Polynesia. A model-based approach incorporating both stratigraphic and artifact sequences lays the foundation for resolving questions concerning human colonization of the Marquesas and other East Polynesian archipelagoes.

**Romero Butrón, Ashuni Emmanuel (INAH Quintana Roo)**

[47]

*From the Coast to the Jungle: Inventory and Record of Archaeological Sites in Puerto Morelos, Quintana Roo, Mexico*

The municipality of Puerto Morelos is located in northern Quintana Roo, Mexico. Beginning in the past century, and continuing through the present day, researchers have reported numerous archaeological sites in this region. However, many of them do not have a precise location, and we do not know about their conservation status. As a result of this issue and the large growth of modern infrastructure in the area, I created the "Proyecto de Inventario y Registro de Sitios Arqueológicos en el Municipio de Puerto Morelos, Quintana Roo" (Inventory and Record of the Archaeological Sites in Puerto Morelos, Quintana Roo Project), which seeks to update information for archaeological sites in the Puerto Morelos region. My main goals include gaining information on the actual condition of the sites and gaining knowledge about cultural processes of the area.

Romo de Vivar, Alfonso [133] see Kita, Yuko

**Rondeau, Rob (Simon Fraser University) and Chris Carleton (Max Planck Institut für chemische Ökologie)**

[98]

*Beringia Underwater: The Search for New Archaeological Sites on the Pacific Northwest Coast*

When and how people first arrived in the Americas remains one of archaeology's greatest mysteries. The earliest archaeological evidence suggests that people migrated from Siberia across the Bering Strait, Beringia, and into Alaska around 14,000 years ago. Where they went from there is still unclear! One hypothesis is that these First Peoples moved down the Pacific Northwest coast on the then mostly exposed continental shelf. Archaeological sites in Alaska and the Yukon suggest that they were big game hunters and that they survived by hunting animals like mammoth, mastodon, and caribou. Around 10,000 years ago, when the last Ice Age ended, sea level rose—flooding what had been a coastal plain to the west of the present coast of Alaska and British Columbia. As a result, potential early archaeological sites are now underwater. The research aims to (1) locate early sites on the underwater landscape and (2) to investigate them firsthand. This presentation outlines how the use of a new computer predictive model developed at Simon Fraser University, combined with the latest underwater surveying techniques and applied technical engineering,

will allow us to investigate marine archaeological sites on the Pacific Northwest coast in ways not previously possible.

Roney, John [37] see Whisenhunt, Mary

**Roos, Christopher (Southern Methodist University)**

**[165]**

*Discussant*

**Rorabaugh, Adam (Washington State Department of Fish and Wildlife) and Amanda Taylor (Willamette Cultural Resource Associates)**

**[39]**

*Assessing Settlement Dynamics in the San Juan Islands and Northwestern Washington, a Bayesian Approach*

Recent developments in Bayesian approaches to radiocarbon dating have enabled reexaminations of questions of population dynamism in the Salish Sea. This study expands on Taylor et al. 2011 using Kernel Density Estimation (KDE) and an expanded dataset of 538 radiocarbon dates from academic and cultural resource management literature. The expanded sample suggests that the patterns of population growth from 3200–2800 cal BP in coastal northwestern Washington, with an influx to the islands during 2600–2200 cal BP. A subsequent decrease in radiocarbon frequencies and large sites suggests shifts in use of the islands, followed by peak large-scale occupation from 650 to 300 cal BP. We compare marine and terrestrial dates to assess the robustness of these patterns. The impacts of erosion and other postdepositional processes on potential dating patterns are considered.

**Rosado-Fuentes, Alejandro (Ciencias de la Tierra, UNAM), Linda Manzanilla (Instituto de Investigaciones Antropológicas, UNAM), Alejandra Arciniega-Ceballos (Instituto de Geofísica, UNAM), Ana Soler-Arechalde (Instituto de Geofísica, UNAM) and Claudia Arango-Galván (Instituto de Geofísica, UNAM)**

**[50]**

*Geophysical Prospection in Xalla, Teotihuacan, Mexico*

We present preliminary results of a nondestructive geophysical prospection conducted in Xalla, Teotihuacan, Mexico, located northeast of the Pyramid of the Sun. Xalla is Teotihuacan's multifunctional palace complex conformed by eight plazas and 29 structures. This study includes data analysis of magnetic, electromagnetic conductivity, and seismic refraction surveys. Analysis of magnetic and conductivity surveys, carried out in seven of the eight plazas, indicate several NW–SE and SW–NE features. These orientations do not match with Teotihuacan's alignment; however, they can be constructive squares modules. Areas considered to be those with the highest human occupation coincide with those with medium to high values in the magnetic and conductivity images. Donut-like shape with lower values at their center in magnetic images, and medium to high values in conductivity images, together with those isolated low magnetic anomalies, could be interpreted as looters' pits or excavation ditches. Seismic refraction was performed in the southeast part of the main plaza. Tomography images suggest architectonic structures such as walls in the shallowest and lowest layers. Deeper seismic features are considered to be of geological origin. Our results shed light on the potential of geophysics prospection to unravel hidden features of the palace of Xalla.

**Rosales, Edgar (INAH)**

**[50]**

*Mica in Xalla: A Glittering Archaeological Indicator of Power and Specialized Production*

Mica, a shiny silicate mineral with a layered structure, was highly valued by the Teotihuacan people. Mica has unique physical properties, but we propose that the most striking one was of an optical nature, owing to the fact that it is a multicolored, specular material. The Teotihuacan elite groups emphasized this value, so they preferred micaceous species of golden tones, to handcraft production specializing in bright and luxury items. More than 90% of the mica found in the Classic city is concentrated in two compounds at Teotihuacan, to the north and the south of the Sun Pyramid: the Xalla Palace and the Viking Group. This research describes the approximately 37 kg of sheet mica found in Xalla during the project "Teotihuacan: Elite and Government" but also the provenance and contexts in which prehispanic mica has been found, as a foreign raw material imported from the Valley of Oaxaca and Ejutla, in the cosmopolitan city in Central Mexico. This workshop under state control shows us a center of exceptional economic and religious strength.

**Rosch, Heather**

**[191]**

*The View from Below: The Contemporaneous View and Role of the Rural, Marginal Areas of Anatolia during the Ottoman Period*

Ottoman archaeology remains in its fledgling stage, struggling against modern research and political biases. This greatly effects the understanding of the rural and highland areas of Anatolia, where excavations or surveys are already less commonly conducted. Historical research has done a great deal to illuminate these places and people, and through art, literature, and government documents, some ideas about the contemporaneous view of rural, highland areas have begun to emerge. Developing archaeological studies add information about tangible interactions and contributions made by rural populations to the Empire at large as well. When viewed together, these sources indicate that ideas about the rural areas changed over the course of the period, but the land itself was seen as valuable, and the people who lived there remained involved in the economy and politics of the Empire at large for the entirety of Ottoman rule.

**Roscoe, Paul (University of Maine)****[142]***Social Substitutability and the Origins of War: An Alternative Theory*

An important theory for the origins of war defines it as lethal retaliatory action based on a structural principle of social substitutability, a principle that any member of the targeted group can be killed to avenge the actions of any one of its members. Prior to the Holocene, according to the theory, this principle (and hence war) did not exist. Lethal violence did occur and the victim's kin might target and kill a perceived malefactor. But these actions constituted homicides, accidents, and capital punishment, not war. War—lethal violence based on social substitutability—arose as human population growth in the Holocene increased competition for resources, and groups started to launch lethal ambushes against rivals for resources. Because ambush is an attack from hiding, however, the attackers' identities could not be known so lethal retaliation was targeted instead at any member of their group, and so war was born. Data from the warring societies of contact-era New Guinea, however, cast doubt on this argument. They indicate instead that social substitution was a product of defensive warfare, a conclusion that undermines the proposition that war evolved in the Holocene and that its emergence depended on a logic of social substitutability.

Rosen, Arlene [93] see Farquhar, Jennifer

Rosen, Arlene [29] see Heidkamp, Blair

**Rosencrance, Richard (Museum of Natural and Cultural History)****[95]***A Western Stemmed Younger Dryas-Aged Sewing Camp at the Connley Caves, Oregon*

There is compelling evidence that people throughout the Americas adapted to the cold Younger Dryas winters by manufacturing tight-fitting, sewn clothing. Ethnographic observations of Arctic peoples indicate that they harvested hide animals and manufactured clothing during residential aggregation events in the fall. Researchers have developed expectations of the types and spatial distribution of tools that may represent such events in the Paleoindian archaeological record. University of Oregon excavations at the Connley Caves in central Oregon encountered a robust Younger Dryas-aged assemblage containing Haskett points, a range of other bifacial tools, eyed bone needles, pigment, faunal remains, combustion features, and hundreds of scrapers in a spatial context that fits the expectations of a sewing camp or aggregation locality. In this paper, I present the context of this assemblage and its lithic technological information to make inferences about the human experience in Oregon during the Younger Dryas. I also present new radiocarbon dates from the nearby Cougar Mountain Cave that are the first on sewn leather artifacts from a Paleoindian site in the Americas.

**[95]***Chair*

Rosencrance, Richard [21] see Kingrey, Haden

Roskams, Steve [38] see Humphreys, Stephen

**Rospopo, Steven (San Juan College Totah Archaeological Project) and Linda Wheelbarger (San Juan College Totah Archaeological Project)****[140]***Evaluation of Occupation History Using Comparative Lithic Analysis at the Point Pueblo LA 8619, San Juan County, New Mexico*

The Point Site, LA 8619, is located along the San Juan River in San Juan County, New Mexico. LA 8619 is a multicomponent site within the Point Community of the Middle San Juan Tradition. Based upon preliminary ceramic analysis, the occupation at the Point Pueblo dates from the AD 900s to abandonment in AD 1300, by Totah, Chaco, and Mesa Verde cultural horizons. Recent San Juan College field school excavations focusing on four large multistory rooms in the Great House, have yielded a quantity of lithic materials including projectile points, axes, ground stone, cores, formal and informal tools, debitage, and exotic artifacts. Multicomponent analysis of the lithic artifacts from the Great House seeks to establish the presence and duration of the three cultural occupations, each with distinctive lithic traditions. This multicomponent analysis provides analysis of the Great House lithic assemblage, complemented by independent analysis of ceramic artifacts from the Point Pueblo. The results of the analysis are then compared with the contemporaneous Tommy Site and Sterling Pueblo sites, in order to evaluate the extent of the Totah, Chacoan, and Mesa Verde occupations in the Middle San Juan area.

**[140]***Chair***Rossi, Franco (Johns Hopkins University) and Heather Hurst (Skidmore College)****[59]***Place-Making at the Los Arboles Complex of Xultun, Guatemala*

In 2010, archaeologists of the San Bartolo-Xultun Project began investigations of an acropolis complex located at the northern limit of the urban center of Xultun, designated "Los Arboles." The penultimate phase of the complex, dating to the Early Classic period (likely fifth century AD), included extensive preserved plaster friezes adorning building facades and platforms. Since then, systematic excavations have studied the multiple phases of Los Arboles' construction sequence and documented the incredibly complex iconographic program marking the acropolis as a sacred location associated with ancestral deities and dynastic history. This paper presents the distinct architectural facades of the penultimate phase of Los Arboles as a unified artistic program that includes iconographies of world trees, rain, maize, fire, and sacrifice, and reflects on Maya place-making through the archaeological context of this urban boundary and its imagery.

**Roth, Barbara (UNLV)****[79]***Discussant***Rothenberg, Miriam (Brown University), Laurel Bestock (Brown University) and Christian Knoblauch (Swansea University)**  
**[36]***Micromorphological Approaches to Daily Life and Cultural Interaction at Uronarti Fortress, Sudan*

Since 2012, the Uronarti Regional Archaeological Project has investigated cultural interactions and daily life along the Egypt-Kush border in the Middle Kingdom (ca. 2050–1650 BCE). In January 2019, eight micromorphological samples were collected from intact floor sequences and mudbrick walls from within the island fortress on Uronarti. These samples span the two centuries from the first occupation of the fortress by rotating garrisons until their replacement by permanent settlers. Using micromorphological thin sections collected from a domestic context, this poster examines two significant aspects of practice: the maintenance of household space over time through the analysis of techniques of floor upkeep and patterns of refuse deposition, and the compositional analysis of mudbrick. This poster asks (1) can micromorphological analysis identify changes in daily practices at Uronarti over time, and if so, what is the nature of these changes; and (2) as the maintenance of space and technology are socially embedded practices, what does continuity or change in these activities indicate about the inhabitants of this house over time? As the first micromorphological analysis undertaken on a Middle Kingdom fortress in Nubia, this project has great significance for the study of colonial contact along the Egyptian-Nubian frontier.

Routledge, Bruce [29] see Robledo, Angelo

Rowe, Brian [51] see Giles, Bretton

Rowe, Sarah [14] see Juengst, Sara

**Royer, Julien (Iowa State University) and Andrew Somerville (Iowa State University)****[68]***White-Tailed Deer Antlers as Proxies for Seasonal Climate Variations*

The use of oxygen, carbon, and nitrogen isotope analyses of faunal bone samples can provide information reflective of past environmental conditions. White-tailed deer (*Odocoileus virginianus*) antlers, although found in many archaeological assemblages, remain underutilized as paleoenvironmental proxies. Here we assess their feasibility to serve as proxies of past seasonality by analyzing both apatite ( $\delta^{13}\text{C}$ ,  $\delta^{18}\text{O}$ ) and collagen ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ) phases of four modern white-tailed deer antlers from central Iowa. These samples were then compared with climate data (precipitation, relative humidity, and temperature) from their respective years of death and location. Because antlers develop from early spring to late summer, they may represent a viable proxy for interpreting intra-annual seasonal variations and provide snapshots for climates. Such relationships between sampled antlers and their associated climate would provide a strong argument that the stable isotope values of carbon, nitrogen, and oxygen of white-tailed deer antlers can be used to reconstruct paleoclimates. Therefore, this method can help relate behavioral ecology to important past human events. Potential complications with the method include variable rates of antler growth, the ingestion of water from various sources by the deer, and the age of the specimens.

Royster, Thomas [91] see Pollack, David

Rufolo, Scott [179] see Desjardins, Sean

**Ruiz, Judith (Estudios Mesoamericanos, UNAM), Isabel Casar Aldrete (UNAM) and Vera Tiesler Blos (UADY)****[154]***Human Sacrifice and Body Processing in Late Eastern Mesoamerica: New Evidence from Toniná, Lagartero, and Champotón*

A number of non-reverential, highly processed human assemblages containing mutilated sternal bones have been documented in different parts of Postclassic period Mesoamerica and beyond after being described by Carmen Pijoan in a massive ritual deposit from Tlatelolco, in the Aztec capital. In this presentation, we document and interpret five such deposits. These come from three securely dated Eastern Mesoamerica contexts at the sites of Toniná and Lagartero, two late centers in the Chiapanecan Highlands, and Champotón, on the west coast of the Yucatecan peninsula. All damaged sternal bones display forceful horizontal or diagonal blows to green bone, which appear to have severed the upper from the lower segment in one single action. All contexts show additional signs of having been flayed, defleshed, and disarticulated. Six pairs of adult hands and three more pairs of feet were recovered from one of these assemblages. Bioarchaeological isotopic research provides glimpses into the lifestyles and diets of the individuals, while skeletal imagery prompts reflections on the possible ritual choreographies and ceremonial occasions surrounding their deaths; namely, those related to Xipe rituals.

Runggaldier, Astrid [80] see Craig, Jessica

Runggaldier, Astrid [80] see Flanagan, Kelin

Russ, Jon [32] see Fields, Mara

**Rutecki, Dawn (Grand Valley State University)**

[52]

*Avian Iconography at Spiro Mounds*

Much of the research and scholarship in Southeastern iconography focused on birds and avian or avian anthropomorphic imagery emphasizes connections to warfare, especially raptors and woodpeckers. While some research has discussed how birds relate to broader patterns in iconography, notable gaps in literature exist pertaining to how birds are integrated into the wider corpus of engraved shell iconography. In this paper, I discuss how birds and avian-related iconography intersect with other zoomorphic images on the engraved shell from Spiro Mounds, Oklahoma, when faunal materials and the interactive network of sites connected to Spiro are considered. In particular, I interrogate how positionality of birds, stylistic variance, and additional iconographic elements can provide a usefully nuanced understanding of how birds and avian imagery depicted on engraved shell from Spiro impact archaeological interpretations of the Spiroan community.

**Rutherford, Cady (University of Texas, San Antonio) and Marisol Cortes-Rincon (Humboldt State University)**

[23]

*Craft Production and Economic Integration in Hinterland Households*

[WITHDRAWN]

Rutherford, Cady [152] see Cortes-Rincon, Marisol

Ruvalcaba Sil, Jose Luis [177] see Cruz Jimenez, Ricardo Leonel

**Ryan, Karen (Canadian Museum of History), Elsa Cencig (Avataq Cultural Institute), Susan Lofthouse (Avataq Cultural Institute) and Tommy Weetaluktuk (Avataq Cultural Institute)**

[148]

*The Qajartalik Petroglyph Site*

In 2017, the Canadian government nominated eight places as candidates for future designation as a UNESCO World Heritage Site. One of those is Qajartalik, located off the coast of Nunavik, where more than 180 anthropomorphic faces were carved into soapstone outcrops between 1,500 and 700 years ago by a Palaeoinuit population referred to as Dorset by archaeologists and Tuniit by Inuit. Qajartalik's nomination for UNESCO status was submitted by the Avataq Cultural Institute, the Indigenous organization responsible for protecting and promoting Nunavik's cultural heritage, at the behest of community members who recognize the site's cultural importance for Nunavimmiut. With its successful nomination, work at Qajartalik is now shifting to focus on better understanding the site, along with a smaller group of petroglyphs on the mainland, with the goal of placing both within their larger cultural landscapes. This presentation discusses this collaborative and community-based research, highlighting work to date, as well as upcoming plans to digitally document the sites as part of an effort to better visualize, monitor, and preserve the petroglyphs in the face of ongoing environmental challenges.

Rye, Elayne [3] see Dozier, Crystal

Saad, Sarah [52] see Reynolds, Robert

**Sabloff, Jeremy (Santa Fe Institute)**

[104]

*Discussant*

**Safronov, Alexander (Lomonosov Moscow State University)**

[189]

*Wars of the Western Maya Kings: Military Conflicts in Lacandon Selva at the Turn of the Seventh to Eighth Centuries*

The last quarter of the seventh century was marked by the intensification of military and political struggle in the Usumasinta Basin. Loss of control over the Western Lowlands by Kaanu'l power at this time led to wars between the largest political centers of the region—Piedras Negras, Palenque, Yaxchilan, Tonina, and Saktz'i. The Lacandon Selva (Chiapas Piedmont) area in southwestern part of the Usumasinta Basin became the epicenter of their political interests, since this area opened access to the control of the important Usumasinta communication route. In current presentation, we will try to reconstruct some problematic episodes of these wars base on reviewing of epigraphic sources from Tonina, Piedras Negras, and so-called "Bonampak area"—complex of unprovenanced monuments including inscription of Saktz'i kings, and its correlation with new archaeological data. As the result, we will show a more complete picture of military and political events at this period. Base on GIS methods we want to model main communication routes and approximate political boundaries of Western Maya kingdoms and to describe the logic of the military struggle in the area of Lacandon Selva on the south of Usumasinta Valley in the Late Classic period.

Sahib, Mohammed [47] see Klenck, Joel



**Sakai, Sachiko (California State University, Long Beach)****[46]*****Reconstruction of the Site History of 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 in the Arizona Strip was recently conducted after more than 15 years of intense surface surveys. 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. 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 periods. Both radiocarbon dates and optically stimulated luminescence (OSL) dates, however, range AD 476–1350, beyond the Pueblo I period. Thus, it is 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 and the energy devoted to its construction. In this paper, I will present the results of chemical compositional analysis of soils using pXRF from different depths in one of the rooms, combined with OSL dates to investigate the history of occupation.

**[46]**

Chair

**Salas, Hernán (Universidad Nacional Autónoma de México)****[71]*****La construcción del paisaje rural en pueblos del sur de Tlaxcala, México***

Los pueblos del sur de Tlaxcala, han construido su territorio desde las épocas prehispánicas, como lo atestiguan los sitios arqueológicos que aquí se ubican. Esta presentación considera, desde la antropología económica, que los paisajes rurales se van formando de manera sucesiva y sobrepuesta, mientras sus habitantes transitan desde una cultura lacustre hacia una agricultura incipiente, un modelo agropecuario, urbano-industrial y comercial que predomina en el presente. Cada modelo va a contribuir con una parte del paisaje que se construye como un palimpsesto, un espacio que no borra del todo el texto original y que al mismo tiempo permite constantemente su re-escritura. Una expresión y resultado de este largo proceso es el paisaje rural que observamos en la actualidad compuesto por partes de modelos que al mismo tiempo representan la historia del capitalismo en la región, donde los actores sociales y la población participa caracterizada por su pluriactividad. El objetivo de esta presentación es hacer un repaso por esta historia, una que ha dejado huellas tangibles en la región, como los aspectos físicos del paisaje, e intangibles como la organización social, las relaciones de poder y la identidad de sus habitantes.

**Salazar Chávez, Victor Emmanuel (George Washington University) and Jeffrey Blomster (George Washington University)****[170]*****Quotidian and Ritual Use of Maize at Early Formative Etlatongo, Oaxaca, Mexico***

Recent research on subsistence systems in Early Formative (1600–900 BCE) Mesoamerican communities contest long-standing concepts linking the growth of early sociopolitical complexity with full-time agriculture. Lowland-focused studies have introduced mixed nonagricultural models in coastal regions that were able to support both sedentary groups and much larger complex societies. While these studies bring important challenges to long-held models of the primacy of full-time agriculturalists in early sociopolitical complex societies, their applicability beyond the lowlands to contemporaneous societies lying in different environmental settings remains understudied. In this paper, we present the case study of the Early Horizon (1400–1000 BCE) highland community of Etlatongo in the Mixteca Alta of Oaxaca. Analysis of a large and well-preserved charred macrobotanical collection sheds light on maize-based diets and the role of this important crop in both subsistence and early public rituals. Compared to contemporaneous lowland societies, maize constituted a major part in the diet of ancient villagers at Etlatongo, as well as an inherent component in communal ceremonies, setting the grounds for the latter maize iconography so commonly associated with the political economy of Mesoamerica.

Salazar Chávez, Victor Emmanuel [102] see Blomster, Jeffrey

Saldana, Melanie [158] see Brady, James

**Saldaña, Gabriela, Tia Watkins (University College London), Rosamund Fitzmaurice (University College London), Adam Jurský (Univerzita Komenského) and Julie Hoggarth (Baylor University)****[23]*****Analysis of the Built Environment of the Group B Acropolis at Baking Pot: Results of the 2019 Field Season***

The ceremonial center of Baking Pot, Belize is one of the longest occupied sites in the Belize River Valley, starting in the Late Middle Preclassic (600–300 BC) and spanning through the Terminal Classic (AD 750–900/1000) period, with some evidence of reoccupation during the Late Postclassic (AD 1200–1521) period. Considerable research efforts over the past three decades by the Belize Valley Archaeological Reconnaissance project (BVAR) have contributed significantly to our understanding of the Baking Pot site core and its hinterland. In this poster we present the results of recent excavations at Structure B7, a large audiencia (an elongated multi-roomed structure) that provided the primary formal entrance into the private palatial compound of Group B. Research in the 2019 field season focused on understanding the organization and spatial layout of elite monumental architecture based on questions regarding accessibility and interaction between elite agents within such compounds. This poster reports on the field methods, data collection, and analysis of the architecture and materials recovered during the 2019 field season.

Salgado, Jocelyn [63] see Leal Hernandez, Edgar

**Salgado-Flores, Sebastian (University of Texas, San Antonio)****[170]***Postclassic Firewood Management at Mensabak, Chiapas, Mexico: Using Forest Surveys and GIS Modeling to Predict Charcoal Midden Composition*

Over the last several decades, research in anthracology (the study of charcoal recovered from archaeological sites) has become increasingly relevant to our understanding of human-environment dynamics. The field's understanding of human fuelwood collection is currently based on a model guided by the "Principle of Least Effort," which expects wood gatherers to optimize the amount of energy gained from each firewood harvest. Since the difference in heat release between higher and lower quality fuelwoods is marginal compared to the heavy labor cost of cutting and transporting wood, this model assumes that ancient harvesters prioritized convenience and harvested species relatively indiscriminately, creating archaeological deposits of charcoal that more or less mirror the full range of species available in the site catchment area. This paper uses charcoal identification, lidar data, forest surveys, and GIS modeling to test this assumption, and shed light on how site placement and social practices affected Postclassic Maya fuelwood choices.

**Samec, Celeste (Instituto de Ciencias Naturales Alexander von Humboldt, Universidad de Antofagasta, Chile), Hugo Yacobaccio (Consejo Nacional de Investigaciones Científicas y Técnicas) and Patrick Roberts (Max Planck Institute)****[72]***Late Holocene Pastoralism and Environmental Change in the Puna Highlands of South America: Stable Isotope Analysis of Camelids Bones and Teeth*

The goal of this work is to study llama herding in the Puna Highlands of Atacama during the final period of the Late Holocene (700 years BP to present day), focusing on the link between mobility and climate change. South American camelids are the only large mammals that were domesticated in the Americas and llamas have been an important resource for Andean societies as a source of meat, fiber, and transportation. In the Puna Highlands, transhumant camelid pastoralism developed ~4000 years BP and remains an important economic activity today. In this work, we will present stable isotope compositions of modern and archaeological llama bones and teeth ( $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values measured on bone collagen, as well as  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  values measured on tooth enamel). The information obtained from the stable isotope analysis of modern llama tissues with known movements and diets will be used as a reference for the interpretation of the stable isotope composition of the llama specimens recovered at the archaeological site of Cueva Chayal. Overall, the combination of bulk bone collagen analysis and teeth enamel sequential analysis will provide valuable information to understand how the diet and mobility of domesticated camelids varied from a diachronic perspective.

**Sampeck, Kathryn (Illinois State University)****[132]***Nahua Diaspora and Cacao*

A significant amount of archaeological evidence demonstrates that Late Postclassic Mesoamericans exchanged cacao intensively and over long distances. A reason for high-volume cacao commerce in the fourteenth and fifteenth centuries was the expansion of its use from a ritual offering and the ingredient in socially important foods and beverages to a commodity money, as well. Although most anyone could grow some cacao, only a few places managed to grow and process cacao at a high enough volume to satisfy common exchange across Mesoamerica; those places were strongly connected to Nahua populations embedded within regions inhabited by Maya and other Mesoamericans. This Nahua diasporic association is not just with cacao, but particularly high-volume and widely distributed cacao circulation above and beyond the reach of large political entities such as the Triple Alliance. This contribution will interrogate how roles in commodity production and circulation relate to processes of diaspora and identity formation and maintenance in the Late Postclassic.

**Sampeck, Kathryn (Illinois State University)****[186]***Chair*

Samson, Alice [96] see Martinez Milantchi, Maria Mercedes

**Samuelsen, John (Arkansas Archeological Survey, University of Arkansas)****[96]***An Isotopic Assessment of Late Prehistoric Interregional Warfare in the Southcentral United States*

There is a great need to develop better methods to identify and quantify warfare when it occurs without accompanying written documentation, and to consider alternative explanations of data. This study tests if late-prehistoric Caddo communities in southwest Arkansas were committing large-scale acts of violence against neighboring regions. Concurrent archaeological evidence of increased violence in the Southern Plains and the Eastern Woodlands may reflect increasing tensions between regions. Alternatively, unusual burial treatments often attributed to warfare might indicate alternative practices involving transport of partial skeletal remains for special burial at important regional centers. Previous research has suggested that deposits of skulls and mandibles at the Crenshaw site in southwest Arkansas were victims of warfare from other regions, but research based on Sr isotopes suggested they were local burials. This study recognizes the weakness of using Sr isotope data alone and uses Pb isotopes in combination to evaluate the geographic origin of the remains. In order for this to be accomplished, a clearly developed method for constructing an isotopic background for Pb isotopes was needed. This study used ancient human and animal teeth to construct a background for southwest Arkansas and other regions in surrounding states to assess the humans' geographic origins.

**Sanchez, Fabiola (University of Victoria), Joel Palka (Arizona State University) and Joshué Lozada (INAH)****[189]***Women's Hands in the Rock Art of Mensabak Lake, Chiapas, Mexico: An Approach from the Agency Theory*

Representations of hands in rock art is a polysemy motif registered among different archaeological sites in Chiapas, Mexico. Painted hands are a recurrent representation in the cliffs of Mensabak Lake in the Lacandon Rainforest, where these paintings were made by both positive and negative techniques. This paper will discuss the semantics of hand representation in rock art and will compare the results of the study with present-day Maya Lacandon. The team used a participative methodology to measure hands of men and women from different ages to identify the sex and age range of the people who made prints on the cliffs. Those results indicated that 22% of the hand prints in the rock art in Mensabak Lake were made by young women. The action and participation range of young Maya women used in rituals in the sacred cliffs has been made using the human agency theory. Parallel to this research, we will use the ethnographic data gathered to contrast Maya Lacandon women's role in current rituals performed in the shrines in the surroundings of this sacred lake.

Sanchez, Fabiola [59] see Lozada, Josuhé

Sánchez, Rodrigo [157] see Martínez-Carrasco, Andrea

**Sánchez de la Torre, Marta (SERP, Universitat de Barcelona), Xavier Mangado (SERP, Universitat de Barcelona), François-Xavier Le Bourdonnec (IRAMAT-CRP2A), Bernard Gratuze (IRAMAT-CEB) and Mathieu Langlais (PACEA)****[77]***Lithic Procurement at Montlleó Open-Air Site (SW Europe): Tracing Past Human Routes*

Montlleó open-air site (Prats i Sansor, Catalonia) is located in one of the largest high-attitude valleys in the Pyrenees, the Cerdanya Valley, in southwest Europe, at 1,144 m asl. The site is in a natural road to cross the Pyrenees in the eastern part. The site, discovered in 1998 and excavated since the 2000s by a multidisciplinary research team from the SERP (University of Barcelona), was occupied by hunter-gatherer groups during the Upper Paleolithic. Research has previously identified at least two different chronocultural occupations: one possibly dated from the Badegoulian (16,900 ± 110 BP and 18,860 ± 80 BP non cal) and another from the Lower Magdalenian (15,440 ± 80 BP and 15,550 ± 140 BP non cal). Lithic raw materials recovered at Montlleó are diversified by the presence not only of exogenous rocks, such as chert, but also by local rocks, such as rhyolite, quartz, quartzite, and lydite. The archaeopetrological study of the recovered lithic set has included micropaleontological, petrographical, and geochemical analyses (energy dispersive X-ray fluorescence and laser ablation-inductively coupled plasma-mass spectrometry). Results have allowed the determination of raw material origins, showing a great knowledge of the Pyrenean territory and making evident the relationship between both Pyrenean slopes during the Late Glacial Maximum.

**Sánchez Mosquera, Amelia (Consultora en Patrimonio y Cultura)****[149]***Agricultura ancestral y dinámica social en Quito desde el Formativo hasta la República Temprana*

Durante el monitoreo arqueológico de la línea 1 de Metro de Quito se identificó 23 evidencias de campos de cultivos antiguos. Los resultados de los análisis confirman su presencia desde el periodo Formativo, y una persistencia hasta el periodo republicano. Se observó que las evidencias más antiguas se encuentran hacia el NW de la ciudad. Por primera vez se analizan testimonios encontrados desde el norte y hacia el sur de Quito. Todo el esquema de uso funcionó en torno al aprovechamiento de humedales y el monocultivo del maíz doméstico.

**[149]***Chair*

Sandoval, Fernanda Lucia [71] see Perez, Angelica

Sandweiss, Daniel [6] see Landazuri, Heather

**Sanger, Matthew (National Museum of the American Indian)****[109]***Discussant*

Santander, Boris [68] see de Souza, Patricio

Santiago, Louis [23] see Fedick, Scott

Santiago, Sandra [155] see Alcántara, Rosa

Santoro, Calogero [144] see Herr, Sarah

Santoro, Calogero [114] see Ugalde, Paula

Santos, Roberto Ventura [87] see Pugliese, Francisco

**Sanz Borràs, Montserrat (Universitat de Barcelona), Joan Daura (Universitat de Barcelona), Dan Cabanes (Rutgers University), Natalia Égüez (Universidad de La Laguna) and Ángel Carrancho (Universidad de Burgos)**

[174]

*Recognizing Early Use of Fire in the Paleolithic of Europe*

Controlling the use of fire was a technological milestone in human evolution. The beginnings of the control of fire remain controversial because preserved hearths containing a combination of combustion residues are easily altered and their identification in the archaeological record can be hindered by taphonomic biases. Excavations at the Gruta da Aroeira (Portugal) have yielded evidence that we interpret as one of the earliest examples of anthropogenic fire recorded in western Europe to date. The site is one of the very few Middle Pleistocene localities to have provided a fossil hominin cranium associated with Acheulean bifaces in a cave context with evidence of human occupation dating to ca. 400 ka (Marine Isotope Stage 11). Our interpretation is based on the study of the by-products of burning (charcoal, bones, sediments and lithics) from the site's layer X (mostly, from sub-layer Xc), employing soil micromorphology, organic chemistry, Fourier Transform Infrared spectroscopy (FTIR), magnetic properties, elemental composition, energy-dispersive X-ray spectroscopy, and the analysis of spatial distribution patterns. Our results add to the still-limited knowledge about the controlled use of fire in the Lower Paleolithic and contribute to ongoing debates on the behavioral complexity of the Acheulean of Europe.

**Sato, Takao (Keio University), Ryohei Sawaura (Okinawa Prefectural Museum and Art Museum), Junmei Sawada (Niigata University of Health and Welfare), Takehiko Watanabe (Keio University) and Takashi Nara (Niigata University of Health and Welfare)**

[72]

*Hunting Activities of Upper Paleolithic Humans in the Japanese Archipelago*

Much of the Japanese archipelago is covered with layers of acidic loam originating from volcanic eruptions. For this reason, there are very few Paleolithic sites that contain well-preserved faunal remains. In fact, there are only six known sites on the four main islands of Japan (Hokkaido, Honshu, Shikoku, and Kyushu Islands) which have seen the excavation of faunal remains. In addition, most of these are the remains of large terrestrial mammals such as Naumann's elephant (*Palaeoloxodon naumanni*), a large species of deer (*Sinomegaceros yabei*) and the steppe bison (*Bison priscus*), which shows the importance Paleolithic hunters in the Japanese archipelago placed on big-game hunting. However, we unearthed a large number of remains of Japanese hares (*Lepus brachyurus*) located in close proximity to backed knives from the Shitsukari-Abe Cave in the northernmost part of Honshu. According to ethnographical descriptions, many modern hunters use traps or special sound decoys to hunt Japanese hares regardless of the region they are based in, thus making the aforementioned results highly significant. In this paper, we will report on the Shitsukari-Abe Cave excavation results and reexamine the hunting activities of Paleolithic humans in the Japanese archipelago.

Saucedo Zavala, Alfredo [101] see Carballo, David

Saumur, Jennifer [155] see Davila, Carol

Sawada, Junmei [72] see Sato, Takao

Sawaura, Ryohei [72] see Sato, Takao

Sawyer, Alicia [95] see Holcomb, Justin

**Sayre, Matthew (High Point University)**

[90]

*Heritage, Museums, and Place Making at Chavín de Huántar*

The Formative site of Chavín de Huántar in Peru is widely regarded as an important early pilgrimage center. This reputation was passed on to Spanish chroniclers by early colonial inhabitants of the site. Yet, in many ways the site has occupied a more important space in the national historical narrative than it has in local history and identity. In this paper I explore the contrasting senses of the heritage of Chavín de Huántar in Lima and in the region surrounding the site. This will involve discussions of recent political history, counter-operations against guerilla forces, the battles over where to store important artifacts, and the recent construction of a large museum in the town of Chavín de Huántar.

**Scaffidi, Beth (University of California, Merced), Aleksa Alaica (University of Toronto), Luis Manuel Gonzalez La Rosa (University of Toronto) and Kelly Knudson (Arizona State University)**

[45]

*Local People and the Circulation of Nonlocal Animals and Objects: Rethinking Interregional Mobility in the Arequipa Yunga during the Circum-Wari Era*

The Wari imperial era (ca. AD 600–1000) is known for heightened interregional interaction, evinced by the relative abundance of nonlocal artistic styles throughout the Andes. Wari-era sites generally show greater variability in human  $^{87}\text{Sr}/^{86}\text{Sr}$  (a marker for

nonlocal origins) than other eras (Scaffidi and Knudson 2020), but it remains unclear whether this was uniformly the pattern throughout the Andes. At many Middle Horizon sites, it remains unclear whether artifacts and animals were actually moved between communities and regions, or whether imperial styles were rendered on locally made objects. To address these questions, we compare  $^{87}\text{Sr}/^{86}\text{Sr}$  variability at Wari hinterland sites in the Arequipa yunga between camelids and artifacts (trophy heads, weaving implements, and textile components). We also use archaeological and water  $^{87}\text{Sr}/^{86}\text{Sr}$  isoscape models to identify probable nonlocal animals and objects and their likely provenience zones. Significantly more artifacts (67%,  $n = 46$ ) are nonlocal than camelids (18%,  $n = 71$ ) (Chi-square = 28.659,  $p < 0.001$ ). This, combined with the near-coastal and near-highland  $^{87}\text{Sr}/^{86}\text{Sr}$  signatures of these objects and animals suggests that down-the-line exchange of artifacts was more common than camelid caravans into near-neighboring zones, calling into question the assumption of heightened Wari-era interregional interaction in this region.

**Schaefer, Benjamin (University of Illinois, Chicago), Gabriel Prieto (University of Florida) and John Verano (Tulane University)**

**[182]**

*My Heart in Their Hand: Inferring Psychosocial Stress from a Mass Child Sacrifice, Pampa La Cruz, Peru*

Child sacrifice has been practiced by many ancient societies over time although archaeological evidence is often lacking. Scholars have attempted to investigate the motivations behind intentional state-sanctioned killings; however, the missing archaeological context leaves these interpretations up for debate. Outside of modern-day Trujillo, recent excavations in Huanchaquito-Las Llamas (HLL) recovered the largest mass sacrifice event in the Americas dated to the terminal Late Intermediate period (ca. 1400 CE). These tributes were drawn from adjacent river valleys and sacrificed during the decline of the Chimú domination of the North Coast. This study draws on data derived from assaying endogenous cortisol in archaeological hair strands from human sacrifices ( $n = 40$ ) at a new sacrificial site north of HLL known as Pampa La Cruz. Hair grows approximately at a rate of 1cm a month and allows for reconstructing monthly patterns of stress leading up to sacrifice. Preliminary results suggest high cortisol levels indicate elevated psychosocial stress that was exacerbated by environmental catastrophe and social instability during the thirteenth and fifteenth centuries CE. This project aims to investigate how various social processes may have played a pivotal role in regulated cortisol production, social inequity, and overall health prior to sacrifice.

Scheifler, Nahuel [28] see Gutierrez, Maria

Scherer, Andrew [136] see Roche Recinos, Alejandra

Schild, Kristin [35] see Kelley, Alice

**Schirmer, Ronald (Department of Anthropology, MSU Mankato)**

**[105]**

*Beyond the Big Valley: Expanding the Temporal, Spatial, and Cultural Context of Red Wing's Silvernale Phase*

The Red Wing Region in the northern Mississippi valley is best known for the Silvernale phase characterized by extensive but ambiguous evidence of some kind of relationship to Middle Mississippian communities downriver. The last two decades of research here have greatly clarified the nature of Red Wing communities during this phase as far less Middle Mississippian than previously thought, and have also highlighted the need to pay greater attention to the presence of materials and traits not related to the Cahokia sphere. Contemporaneous with the Silvernale phase, Red Wing's connections stretch from northern Wisconsin and Minnesota west and south through the eastern Dakotas, southwestern Minnesota, and northern Iowa, indicating connections with groups affiliated with Plains Village, Middle Missouri, and Mill Creek traditions, as well as with various, poorly understood Late Woodland groups. Moreover, evidence from Red Wing indicates that these connections were long-standing and persistent, beginning before and lasting after the period of Middle Mississippian interactions, and integrated many different communities through time, across environmental and cultural boundaries.

**Schlanger, Sarah (Independent Researcher)**

**[49]**

*Exploring the Complexities of Managing Cultural Landscapes and Associated Data through the Lens of the Greater Chaco Landscape*

There may be no more vexing heritage resource issue facing public land agencies today than the management of culturally significant landscapes. The challenges begin with identification. They continue through the definition of critical values and appropriate conservation measures and are exacerbated by issues of data use and sharing among critical landscape constituencies. The foremost constituents are associated descendant populations, but cultural heritage management specialists, the archaeological research community, historic preservation interests, and the public also depend on these landscapes to meet their needs and interests. Resolving these issues becomes critical when seemingly stable landscapes are proposed for development. The current focus on the Greater Chaco Landscape provides an opportunity to explore management models for cultural landscapes, our understanding of the distinct data needs of constituent communities, and how the core idea of a culturally significant landscape can help to meet and enhance shared interests. Here I describe existing models for documenting cultural landscapes, identify some data gaps and processual shortcomings, and propose a framework for identifying critical values and monitoring landscape integrity.

**Schleher, Kari (Maxwell Museum, University of New Mexico), Michelle Turner (Crow Canyon Archaeological Center), Benjamin Bellorado (Crow Canyon Archaeological Center), Mariana Lujan Sanders (University of New Mexico) and Genevieve Woodhead (University of New Mexico)**

[26]

*Lumping and Splitting: Design Variation on Mancos Black-on-white Pottery in the Central Mesa Verde Region*

Within the central Mesa Verde region, the Mancos Black-on-white pottery type is an enduring enigma. Mancos Black-on-white was produced from AD 920–1180 and includes a wide range in variation in design and technology. During its production period, nearly identical designs were used across the broader Ancestral Pueblo world. In the Cibola and Kayenta regions, for example, a similar range of designs were used, but archaeologists have separated this range of design variation into distinct, temporally sensitive, pottery types. Under the rubric the Northern Chaco Outliers Project, Crow Canyon Archaeological Center is investigating the Lakeview Community, a cluster of four great houses in southwestern Colorado. Mancos Black-on-white is one of the most common pottery types recovered. Because of its prevalence and the vast amount of variation in the design and technology present on Mancos sherds, Crow Canyon archaeologists have devised a detailed, attribute-based analysis conducted on a sub-set of the 70,000 sherds analyzed to date. The goal of this project is to test whether these differences in design and technology correspond to temporal or production group differences across the community, allowing for more fine-grained discussions of this variable pottery type. Our presentation reports the preliminary results from this exciting study.

Schleher, Kari [2] see Hegmon, Michelle

Schleher, Kari [26] see Schwindt, Dylan

**Schmader, Matthew (University of New Mexico)**

[46]

*First Contact, Pueblo Resistance, and Multiethnic Conflict on the Vázquez de Coronado Expedition of 1540–1542*

The immense expedition into the American Southwest led by Francisco Vázquez de Coronado from 1540 to 1542 was the first contact from outsiders experienced by many indigenous groups of the region. Coronado's entourage included Europeans from several countries, North Africans, Blacks, and Native soldiers from numerous Mexican ethnic groups. Well over 2,500 people made their way into the Southwest and made contact with today's western pueblos, Rio Grande pueblos, and Plains groups with long-lasting results. Conflicts that occurred at several key sites reflect the multiethnic mix of the participants, along with mixed technologies and warfare tactics. Ongoing research at one of the major expeditionary conflict sites, Piedras Marcadas Pueblo (located north of Albuquerque, NM), has been funded by the American Battlefield Protection Program. The site contains a mixture of medieval European military technology, indigenous Mexican weaponry, and evidence of Pueblo resistance rarely seen at contact period sites. Results of recent funded fieldwork highlight the roles of those involved and directly related materials found at the battle site.

**Schmid, Magdalena (Kiel University) and Fiona Petchey (University of Waikato, New Zealand)**

[130]

*Will Summing of Radiocarbon Dates Unlock Scales of Socio-environmental Transformations?*

Demography is a key factor in investigating the relationships between population levels, along with resource availability, environmental dynamics, social organization, and mobility. Prehistoric human activities and population levels can be modeled using summed probability distributions of calibrated radiocarbon dates (SPD), which can be directly compared with climate trends. SPDs, however, can be complex, because they can reflect: (1) population growth/decline represented by peaks/troughs in the analysis, (2) human mobility, (3) plateaus in the calibration curve, or (4) sampling bias. Using kernel density estimation modeling, this paper evaluates a new comprehensive radiocarbon dataset from New Zealand ( $n = 2,200$ ), which is the best dated example of island colonization in the Pacific and has a relatively short 750-year period of settlement. This project develops a regional and temporal marine reservoir curve which enables, for the first time, integration of 950 shell dates in chronological models. A combination of terrestrial and marine radiocarbon ages provides more precise temporal control of archaeological sites relating to Polynesian settlement and subsequent key markers of Maori prehistory, ultimately shedding new light on the impacts of the Little Ice Age on human demography.

**Schmidt, Morgan (Museu Paraense Emilio Goeldi), Jennifer Watling (University of São Paulo), Sam Goldberg (Massachusetts Institute of Technology), Taylor Perron (Massachusetts Institute of Technology) and Afukaka Kuikuro (Kuikuro Indigenous Association of the Upper Xingu)**

[66]

*Formation Processes, Fertility, Spatial Extent, and Carbon Content of Anthropogenic Soils in the Upper Xingu, Southern Amazon*

Recent research in the Upper Xingu carried out in partnership with the indigenous Kuikuro community (Associação Indígena Kuikuro do Alto Xingu; AIKAX) has revealed that modified soils associated with archaeological remains and possibly with ancient cultivation areas may be much more extensive than previously thought. We are working to determine the fertility, carbon content, and overall spatial extent of these soils in the region. Ethnographic research with Kuikuro farmers has revealed the intentionality inherent in the formation of fertile dark earth soils (*terra preta*) around contemporary villages as well as the importance of ancient dark earth sites. Remote sensing and artificial intelligence will allow us to extend our ground-truth data to a wider area to estimate overall extents of modified soils. Combining ethnographic, archaeological, microbotanical, environmental, and satellite data will allow more robust interpretations of land use in the past that resulted in the creation of anthropogenic soils.

Schmidt, Morgan [66] see Watling, Jennifer

**Schnell, Joshua (Brown University)****[115]***Ancient Maya Dentistry: New Evidence for Therapeutic Dental Interventions and Dental Care Practices*

The ancient Maya are often highly regarded for their skill in dentistry—evidenced by long-standing traditions of filing and inlaying teeth. These procedures had a considerable success rate suggesting a pervasive knowledge of dental anatomy among practitioners. However, this study of aesthetic practices has overshadowed the study of the therapeutic interventions and hygienic practices. These aspects of Maya dentistry are often taken for granted and have received comparatively little attention despite archaeological, iconographic, and textual evidence attesting to the importance of oral health. This paper derives from an ongoing dissertation project aiming to assess oral care practices in the Maya lowlands through a large-scale bioarchaeological study of dentitions. Using a multiphase methodology including optical microscopy, dental casting techniques, and scanning electron microscopy, this project seeks to evaluate the prevalence and spatiotemporal distribution of dental interventions such as tooth cleaning, toothpicking, caries manipulation, and dental extractions in the Maya lowlands. It also contextualizes these practices within their social, cultural, and economic milieu, including patient-practitioner networks, urbanism and access to care, and models of market exchange. Here I report on preliminary results of this ongoing study.

**Schollmeyer, Karen (Archaeology Southwest)****[37]***Animal Remains and Archaeological Context in the Mogollon Area, AD 1000–1450*

This poster examines contextual patterns in deposits of animal bones from the Mimbres and upper Gila areas of southwest New Mexico from the Mimbres Classic through Cliff phase Salado periods (AD 1000–1450). Remains of common animal species in contexts like sheet middens and room fill are often interpreted as food remains. Less common animal taxa are more often recovered in contexts such as purposeful floor deposits, floor feature fill, and deposits people left behind in partially filled-in rooms or other contexts where “ordinary” use of a structure had clearly ended. Some deposits include taxa associated with religious activities in southwestern ethnographies, such as carnivores, raptors, and water birds. Some taxa are most common as food remains, but are also sometimes associated with unusual contexts where people imbued them with other important meanings. Comparing distinctive animal bone deposits across time and space allows a more nuanced understanding of variation in the uses of animal taxa for food, raw materials, and for ritual and important events.

**[37]***Chair***Schoville, Benjamin (University of Queensland) and Jayne Wilkins (Griffith University)****[151]***Late Pleistocene Occupation in the Southern Kalahari: New Results from the North of Kuruman Paleoarchaeology Project*

Recent investigations of the southern African Late Pleistocene archaeological record have transformed our understanding of the biocultural evolution of our species. Although the intensity of research on coastal and near-coastal records is greater than in the interior, new fieldwork is beginning to balance this research disparity. Here we report the recent excavations and survey work that has identified Earlier, Middle, and Later Stone Age occupation in the southern Kalahari Basin. Through excavations focused on the stratified deposits at Ga-Mohana Hill North Rockshelter, the evidence for symbolic behaviors suggests adaptive complexity on par with the coastal record. Coupled with surface lithic scatter evidence from our survey work in the Tswalu Kalahari Reserve provides insights into how water availability structured foraging activity in this semiarid landscape. Identifying behavioral variability in the southern Kalahari provides an important opportunity to investigate early human adaptability, a key component for the subsequent dispersal of humans into arid and semiarid regions around the world.

Schreg, Rainer [21] see Fisher, Lynn

**Schreiner, Thomas (University of California, Berkeley)****[48]***Production and Use of Lime for Preclassic Architecture and Causeway Construction in the Mirador Karstic Basin*

Excavations over several decades in the Mirador Basin of northern Guatemala, combined with detailed experimental data, have revealed extraordinary use of lime products in the construction and maintenance of Maya causeways, architecture, and associated art. This paper will consider both the quantitative utilization and qualitative innovations which together demonstrate the power and impact of architectural lime as a defining element of early Maya civilization.

**Schrenk, Alecia****[12]***Chronic Care in the Archaic Midwest: A Bioarchaeological Analysis of Healthcare Provisioning and Chronic Illness at Carrier Mills, IL (6000–3000 BC)*

Bioarchaeology has provided useful data on the relationship between subsistence patterns and human health. Yet few studies have considered healthcare provisioning in their models. The Bioarchaeology of Care (BoC) is a four-stage method for empirically testing the possibility of healthcare provisioning in the past. Using the BoC, this study examines the relationship between chronic illness, subsistence patterns, and healthcare among the Middle Archaic (6000–3000 BC) hunter-gatherers of Carrier Mills, Illinois. The site was a seasonal base-camp that was used predominantly during the fall and winter with a small subset of the population living at the site year-round. Sixteen cases of chronic illness (5 tuberculosis, 10 treponemal infection, 1 blastomycosis) were observed in the Carrier Mills skeletal collection. However, 47% of individuals who contracted these diseases survived to old age. In each case, individuals had impairments that affected mobility and would have required healthcare for survival. Midwestern hunter-gatherers'

usage of seasonal base-camps during the Middle Archaic period may have enabled increased access to healthcare provisioning, which allowed sick individuals to survive into old age. This study provides insights into the daily experiences of managing chronic illness for the Archaic hunter-gatherers of Carrier Mills, Illinois.

Schroder, Whittaker [181] see Murtha, Timothy

**Schroeder, Bryon (Center for Big Bend Studies, Sul Ross State University)**

[65]

*Late Archaic Maize in the Trans-Pecos of West Texas: Implications and Future Research*

The recovery of Late Archaic maize from the Trans-Pecos, peripheral to the American Southwest, adds to an expanding list of primary crop acquisition by foragers that occupied the arid region. The region, however, lacks clear demographic and settlement patterns diagnostic of this period from adjacent regions. Lacking key similarities, local researchers argued the early use of cultigens was superficial. But it is now clear the initial use of maize was both early and extensive across the Trans-Pecos and Southwest with variable effects on settlement and subsistence. This has led to a debate on how to label this early period of cultivar use; is it an extension of archaic lifeways with limited food production, or the onset of an earlier agricultural period? What is clear is the use of maize preceding the formative period spans an appreciable area of diverse desert ecotones. Therefore, situating the role of maize as well as the initial introduction and intensity of use in the Trans-Pecos region is dependent on a larger context that includes all known examples. This paper explores the role of food production in the Trans-Pecos with new radiocarbon and dietary isotope data adding to this larger discussion of early maize use.

Schroeder, Bryon [6] see Niquette, Richard

**Schurr, Mark (University of Notre Dame) and Madeleine McLeester (Dartmouth University)**

[131]

*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.

Schwadron, Margo [130] see Hadden, Carla

**Schwartz, Christopher (Arizona State University), Kelley Taylor (Sacred Scarlets) and Michelle Hegmon (Arizona State University)**

[91]

*The Human Experience of Transporting and Raising Scarlet Macaws at Paquimé in Chihuahua, Mexico*

In the US Southwest and northwest Mexico, prehispanic people valued birds as dietary resources, for their ritual significance, as integral elements of Indigenous cosmologies, and for the economic value of their feathers. Their multifaceted significance is clearest at the site of Paquimé in northern Chihuahua where archaeologists have found evidence for the long-distance transport and local raising of scarlet macaws (*Ara macao*), despite a nearest natural habitat hundreds of kilometers to the south in eastern and southern Mexico. Though the macaws of Paquimé have been well-studied, traditional zooarchaeological approaches occasionally lose sight of how human-animal interactions shaped the daily lives of people in the past. This paper employs an Archaeology of the Human Experience approach to examine what the experience of transporting and raising scarlet macaws would have been like for traveling tradespeople and the prehispanic inhabitants of Paquimé. We draw on ethnohistoric accounts of human-macaw interaction, archaeological understandings of exchange and long-distance transport, and contemporary macaw biology to point out challenges and potential solutions their human keepers could have employed.

[91]

Chair

**Schwarz, Kevin (ASC Group Inc.)**

[173]

*Iterative Temporal Hygiene and Bayesian Analyses of Radiocarbon Datasets: The Impact of Kernel Density Estimation on Clarifying Temporal Relationships among Woodland Period Phases, Middle Scioto Valley, Ohio*

The accumulation of radiocarbon dates for Scioto Valley Woodland period sites has created a palimpsest, which inhibits chronological understanding of cultural change. The project iteratively integrates temporal hygiene and Bayesian analyses of large radiocarbon datasets from multiple sites, in an attempt to clean up problematic features of such datasets and provide for accurate archaeological inference. Temporal hygiene is applied and compared using three levels of stringency, in order to eliminate problematic assays, which result from early low-accuracy radiocarbon dates and non-optimal selection and reporting practices. Kernel density estimation (KDE) smoothing reduces statistical over-dispersion, which results from summing measurement imprecision and issues with the calibration curve. Bayesian analysis is built into the KDE routine, resulting in a more accurate



analysis than otherwise possible. This degree of subtlety of the analysis would be impossible if null hypothesis statistical testing (NHST) were used alone, due to inherent conceptual limitations in NHST. Analysis of 22 radiocarbon dates from five sites at the Columbus Southerly Wastewater Treatment Plant, and comparisons of 64 dates from several relevant regional sites, provide for a refined chronology. This chronology better temporally defines previously overlapping Hopewell hamlet occupations, terminal Middle Woodland–early Late Woodland nucleated settlements, and Newtown phase village occupations.

**Schwindt, Dylan (Crow Canyon Archaeological Center), Kari Schleher (Maxwell Museum, University of New Mexico), Michelle Turner (Crow Canyon Archaeological Center), Grant Coffey (Crow Canyon Archaeological Center) and Benjamin Bellorado (Crow Canyon Archaeological Center)**

**[26]**

*Using Computer Vision and Deep Learning Algorithms to Predict Pottery Types: An Example Using Ancestral Pueblo Pottery from the Central Mesa Verde Region*

Computer vision, machine learning, and artificial intelligence techniques have made much progress in the past several years. Cloud computing has rendered these tools more accessible than ever to researchers in a wide range of fields. Here we explore applications of these models to classify Ancestral Pueblo pottery types in the central Mesa Verde region of southwestern Colorado. We explore a range of models, from deep learning models based solely on image analysis to models that include imagery combined with simple, user-provided observations to predict pottery typology. We also compare deep learning models that predict typology directly with more traditional models that use attributes to predict topology and models that combine both approaches. Finally, we discuss the most promising predictive models for public education products about archaeology and ancient Indigenous technologies.

Scissons, Todd [109] see Hanson, Kelsey

**Scott, John (University of Bristol, Metcalf Archaeology)**

**[153]**

*Crystal Bennett and the 1965 American Embassy Medain Saleh Expedition in Saudi Arabia*

British archaeologist Crystal Bennett (1918–1987) is considered one of the formidable British female archaeologists of the Middle East, conducting investigations across Jordan and beyond from 1957 to 1983. As Dame Kathleen Kenyon's student at the University of London in the early 1950s, she was introduced to Biblical archaeology during the Jericho project in northern Jordan. After Jericho, Bennett joined the Jerusalem British School of Archaeology's (BSAJ) Petra excavation and began her career as a classical Middle Eastern archaeologist focused on the Biblical nations of Edom and Nabataea. In 1965, the US Ambassador to Saudi Arabia accompanied by Bennett led an expedition to the Nabataean site of Medain Saleh in Saudi Arabia. It was the first modern archaeological assessment of Medain Saleh, now a UNESCO World Heritage Site. In 1970, Bennett became the director of the BSAJ and began her work at Busayra, the main administrative and religious center of Edom. She established the British Institute at Amman for Archaeology and History in 1975; she became its first formal director in 1978. Crystal Bennett fundamentally advanced Jordanian archaeology using scientific methods and received an Order of the British Empire (OBE) for this work. This paper focuses on the Medain Saleh expedition.

**Scott Cummings, Linda (PaleoResearch Institute Inc.)**

**[20]**

*What's in a Microscopic Signature? Can We See Social Acceptance and Resistance?*

Colonization of Central and North America involved Spanish mission construction and growing wheat necessary for Eucharist bread. Using evidence of threshing technology, represented by cut phytoliths, as an indicator of trait adoption, we examine missions in California and the southwestern Puebloan region. Introduction of a new religion, new icons, new structures, and new food into traditional cultures is examined using quality of threshing evident in these locations. Traditional threshing sledge use in Spain, the Near East, and circum-Mediterranean produces tiny to microscopic cut straw fragments, establishing a standard. This also was observed in California adobe. The New Mexican Pecos Mission adobe samples, however, yielded wheat seeds and large straw fragments with cuts, indicating coarser chopping and suggesting resistance to adoption of the new system. Challenges of supplanting well-known maize cultivation and processing by wheat in the Puebloan community are compared with success in introducing wheat cultivation and processing to people in California who did not have a grain-based economy. Maintaining standards appears to have been more difficult in New Mexico, suggesting other challenges in a transition not only from maize to wheat, but also in religion and socially, as is evidenced by the Pueblo Revolt of 1680.

**Scott Cummings, Linda (PaleoResearch Institute Inc.)**

**[160]**

*Discussant*

Scott Cummings, Linda [155] see De Lucia, Kristin

Searcy, Michael [55] see Snow, Meradeth

**Sedig, Jakob (Harvard University), Vagheesh Narasimhan (University of Texas, Austin) and Brianna Flynn (University of Texas, Austin)**

**[37]**

*Automatic Classification of Mimbres Pottery Styles through Convolutional Neural Networks*

This poster describes our attempt to address some long-standing questions about Mimbres pottery through convolutional neural network-based classifiers. Over the past few years the field of computer vision has made major strides in classification and segmentation tasks particularly due to the availability of rich training data and development of deep learning-based methods. We used over 8,000 images of Mimbres bowls to train a neural network to distinguish and sort bowls into Style I, Style II, and Style III types. After this initial training proved successful, we retrained the neural network to distinguish between micro-seriation types (e.g., early/late Style II and early/middle/late Style III) and bowls with design elements characteristic of the upper Gila or Mimbres River valleys. In addition, after the AI sorted the bowls into our specified categories, we used metadata associated with the bowls to address questions about production locales and changes through time in Mimbres pottery. Here we present the model we have developed along with results of its application on our dataset and also introduce a new web-based portal for upload of a new bowl for automatic classification into different styles.

**Sedig, Jakob (Harvard University)**

**[55]**

*Chair*

**Sedig, Jakob (Harvard University)**

**[79]**

*Discussant*

Sedig, Jakob [55] see Nakatsuka, Nathan

Sedig, Jakob [55] see Punzo Díaz, José Luis

Sedig, Jakob [55] see Sirak, Kendra

**Seeber, Katherine (Historic Mitchelville Freedom Park)**

**[109]**

*Development and Praxis of Community-Based Archaeology at Historic Mitchelville Freedom Park*

Over the last four years Historic Mitchelville Freedom Park (HMFP), the site of the first Free Black Town in America (est. 1861), has begun a plan to develop the area into a heritage destination. HMFP aims to reconstruct some of the original buildings, develop educational programs, and have a walking and guided tour, among other things. Archaeology at the park has been integral at helping to both locate Mitchelville-era resources and also to develop ethical and sustainable ties with the ancestral Gullah and local Black community. This paper will discuss how using a framework of Indigenous and landscape archaeologies has crafted community-engaged archaeological research as well as addressing the realities of conducting community-based research in targeted communities.

**Segsneider, Martin (NIhK), Hauke Jöns (NIhK), Moritz Mennenga (NIhK) and Jonas Enzmann (NIhK)**

**[98]**

*The SPLASHCOS Viewer: The First Online Atlas of Submerged Prehistoric Sites in Maritime Europe and the Mesolithic Site of Strande, Kiel Bay*

The EU-funded SPLASHCOS network promoted the fledgling discipline of "Continental Shelf Prehistoric Research." This discipline is based on an interdisciplinary research approach combining archaeological, geophysical, geological, oceanographic, and biological methods. Investigations so far have already enormously expanded the available knowledge about prehistoric life on the now-submerged landscapes that were drowned with the sea level rise at the end of the Last Glacial. In many cases the excellent preservation conditions in waterlogged sediments for everyday objects, tools, and structures made of organic materials have provided completely new insights into prehistoric life. The 25 states that have joined the project have screened their databases and publications for relevant data on prehistoric sites and agreed to publish the archaeological data via a web-based viewer. All in all, there are approximately 2,900 Stone Age sites from 19 countries. These data provide an excellent basis to start further investigations, which are needed to understand and protect our underwater cultural heritage. As an example for such further research, the current investigations on the Mesolithic site of Strande, dating from 5300 to 4900 BC, are presented. The site has excellent preservation conditions and lies in a water depth of 6 m.

**Seibel, Scott (AECOM)**

**[35]**

*The Water and the Land: How the Private Sector and Government Work Together to Plan for Climate Change Impacts to Cultural Resources*

Government, inclusive of the local, state, and national levels, is the largest aggregate landholder in the United States and has under its direct jurisdiction the largest array of cultural resources in the country, not to mention the cultural resources under jurisdictional oversight. As such, government is at the spear's point of climate change impacts to cultural resources and thus the need to develop responses to preserve important heritage on behalf of its constituents. That said, the direct ability of government to develop solutions and respond directly is limited by staffing constraints dictated by annual budgets and circumscribed mandates focused on the locations and resources under their direct control and oversight. Conversely, while the private sector typically controls only relatively small and discontinuous landholdings and has no legal mandate, it has a broader, more holistic perspective on potential solutions due to the range of clients it serves, the geographies it covers, and its greater flexibility to engage staff with specialized knowledge and expertise. This poster demonstrates how AECOM as a company works with municipal, state, and federal government agencies to provide strategies and solutions that address climate change impacts to their important cultural resources.

**Seidemann, Ryan (Louisiana Department of Justice) and Christine Halling (Louisiana Department of Justice)****[67]***Assessing the Taphonomic Alterations of 29 Human Anatomical Specimens Confiscated in Louisiana*

Anatomical specimens used for teaching frequently become available for sale online. In one Louisiana case, authorities confiscated 29 human anatomical specimens. These specimens are used to highlight the breadth of information that can be gathered from such isolated human remains. Anatomical specimens are easily identified by the techniques used to prepare them for teaching purposes, which can include calotte cutting, hooks, and springs to reattach the mandible. Postmortem alterations of these specimens result from frequent handling by students and teachers, increasing the likelihood of damage, loss of teeth, pen or pencil marks, or even the buildup of a patina on the surface. The specimens discussed here are all human skulls displaying subtle variations of preparation that appear indicative of different anatomical supply companies' preparation techniques. These specimens represent individuals of all ages and ancestry, with evidence of pathological conditions and cultural modifications including labret wear, generalized porosity, and evidence of infectious disease processes. Anatomical specimens pose unique challenges with regard to postmortem damage that can make analysis more challenging, but may contain verifiable information and clues to the anatomical company that prepared the skull.

Seidemann, Ryan [20] see Garcia-Putnam, Alex

Seidemann, Ryan [20] see Halling, Christine

**Seifert, Martina (Hamburg University)****[124]***Discussant*

Seifert, Martina [124] see Babucic, Nikola

Seifert, Martina [124] see Linstädter, Jörg

Seifert, Martina [124] see Stempfle, Sabrina

**Seikel, Katherine (AmaTerra Environmental; Australian National University), Mindy Bonine (AmaTerra Environmental) and Timothy Griffith (AmaTerra Environmental)****[25]***The Headwaters Site: Preliminary Site Analysis and Featured Finds*

Site 41CM204, the Headwaters Site, is a serially occupied archaeological site in New Braunfels, Texas. The site is located at the headwaters of the Comal River and was occupied seasonally for approximately 8,000 years, up to and including the historic period. However, the Archaic period deposits are the most notable, with excavations revealing over 30 identified features, particularly burned rock middens and earth ovens from hot-rock cooking activities. Excavations conducted by AmaTerra Environmental Inc. at the Headwaters site in 2018–2019 recovered over 100,000 artifacts and samples. This poster presents the results of the 2018–2019 excavations focusing on feature types, artifacts, and preliminary analysis of site components.

Seikel, Katherine [83] see Levin, Maureece

Seitsonen, Oula [93] see Égüez, Natalia

Selden, Robert, Jr. [74] see Etter, Bonnie

Selden, Robert, Jr. [74] see Covey, R. Alan

Seligson, Kenneth [22] see Landa, Yesenia

Sellet, Frederic [1] see Potter, Bethany

**Semanko, Amanda (New Mexico State University)****[72]***Prehistoric Dogs of the Southwest*

For over 15,000 years, dogs have been accorded varying social roles within human society. In view of this, the Canine Surrogacy Approach derives from observations that dogs often consume the same food as people and accompany humans during migration. Dogs are commonly granted similar burial customs, as well. I explore this proxy approach through the case study of a Georgetown-phase (AD 550–650) dog burial from Kipp Ruin, a Mimbres site in southern New Mexico. Analyses of stable isotopes shed light on the diets of both dogs and humans, and I will demonstrate their potential to identify mobility patterns as well. To further contextualize the life histories of dogs, I compare the frequency and circumstances of dog burials in the Southwest with ethnohistoric and ethnographic data from indigenous southwestern cultures.

**Semon, Anna (American Museum of Natural History)****[11]***Surveying New York City Collections at the American Museum of Natural History*

The North American Archaeology Collection at the American Museum of Natural History contains more than 4,000 cataloged objects from New York City. These accessions were acquired or donated to the museum between 1869 and 2017. In this poster, I examine these legacy collections by exploring the materials and artifact types collected from the area. In addition, I present spatial data associated with these accessions and focus on reconstructing several site locations within the boroughs, including City Island, Pelham Bay Park, and Van Cortlandt Park in the Bronx; Inwood and Washington Heights in Manhattan; and Mariner's Harbor, Old Place, Tottenville, and Watchogue in Staten Island. This research helps to explore city development through time and improves our understanding of past landscapes in New York City.

Semon, Anna [8] see Musch, Abigail

Seowtewa, Octavius [109] see Hanson, Kelsey

**Serra Puche, Mari Carmen (IIA-UNAM)**

[71]

*Los volcanes y Xochitécatl-Cacaxtla un paisaje sagrado*

En épocas prehispánicas, las comunidades rodeadas de sierras, sistemas montañosos y, principalmente, por los grandes volcanes de la zona media de Mesoamérica, poseyeron una estructura ritual íntimamente ligada con la devoción a estos accidentes orográficos, al grado, que está ha generado una línea de continuidad que aún se puede apreciar en las ceremonias y ritos de los pobladores actuales. Las exploraciones arqueológicas que hemos realizado en el antiguo centro ceremonial de Xochitécatl y sus alrededores, están en el vértice de un extenso sistema de aprovechamiento de recursos naturales y zonas de cultivo y construido en la cima de un volcán extinto. Su relación con los volcanes es única, desde, la plataforma de la plaza central, que hemos llamado Basamento de los Volcanes, se contempla al Suroeste las grandes elevaciones de la Sierra Nevada, la cual culmina en las cimas del Popocatepetl y el Iztaccíhuatl, al oriente se puede apreciar el perfil femenino de la Malinche. En la traza arquitectónica de Xochitécatl-Cacaxtla es evidente la importancia que tenían estas cimas en la vida y cosmovisión de sus habitantes, por lo que podemos concluir que los edificios del conjunto son las réplicas del lejano perfil de las montañas, una maqueta simbólica.

Shahack-Gross, Ruth [191] see Butler, Don

Shank, Cody [119] see Beach, Timothy

Shannon, Amy [72] see Moss, Madonna

**Shantry, Kate (Washington State University)**

[142]

*Enamel Rocks Resulting from Culturally Heating of Quartzite*

Quartzite is a commonly identified material used in the past as heating stones. The quartz minerals in quartzite stones are stable to around 500°C, at which point the quartz mineral experiences a chemical transition or inversion. A second inversion occurs at around 1500°C, causing the morphology to appear similar to tooth enamel. This allows for identification of heated quartzite stones post-use. Results of experimental heating of quartzite in an outdoor fire and a controlled furnace are presented here in an effort to increase field identification and interpretation of culturally heated rock.

**Sharp, Kayeleigh (Southern Illinois University, Carbondale; Johnson County Community College)**

[118]

*Northern Gallinazo: A Transformational View from the Lambayeque Region, Peru*

Gallinazo sociopolitical organization is rarely considered outside the Virú Valley heartland. My recent work in the Lambayeque region of northern coastal Peru brings to light several anomalies that force reevaluation of long-standing ideas. Today, there are several persistent yet mistaken observations that continue to skew the perception of prehispanic Andean civilization on Peru's north coast, one of two regional hubs that saw the emergence of multiple complex societies over time. In the Lambayeque region in particular, a notable settlement pattern consisting of (1) large-scale monument building near (2) dramatic natural landforms (3) juxtaposed by stone-masonry residential complexes (4) often found in association with canal systems, and (5) mineral resources is observed throughout the first millennium. The strong association of this site form and the abundant presence of pottery decorated with emoji-like Gallinazo expressions are most intriguing. Two prominent Gallinazo sites, (1) Songoy-Cojal situated in the mid-Zaña Valley and (2) Huaca Letrada in the La Leche Valley, provide strong evidence that the pattern endured for several centuries. Might the Lambayeque region hold answers to questions of independent Gallinazo developments and social identity? In this paper, I present new lines of evidence that help to place the northern Gallinazo polity in perspective.

Sharp, Kayeleigh [182] see Shimada, Izumi

**Sharpe, Ashley (Smithsonian Tropical Research Institute), Nicole Smith-Guzmán (Smithsonian Tropical Research Institute) and Richard Cooke (Smithsonian Tropical Research Institute)**

[178]

*A Preliminary Multi-isotope Assessment of Precolumbian Humans from Panama*

This study presents data on the first multi-isotope analysis of precolumbian humans in Panama. We use carbon ( $\delta^{13}\text{C}$ ), nitrogen ( $\delta^{15}\text{N}$ ), oxygen ( $\delta^{18}\text{O}$ ), and strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) isotopes to determine the diets and mobility patterns of individuals from seven archaeological sites: Cerro Mangote, Sitio Sierra, and Cerro Juan Díaz in central Pacific Panama; Cerro Brujo and Sitio Drago along Panama's northwest Caribbean coast; Jicarita Island in the Gulf of Chiriquí; and Pedro González Island in the Gulf of Panama. Our initial hypotheses were that individuals from coastal settlements would consume more marine resources than those from inland settlements, that dependency on maize in the diet would increase over time, and that there would be little evidence for mobility. Generally, the results did not support these hypotheses, with the inland community of Cerro Juan Díaz regularly consuming marine food, maize consumption being variable over time at different sites, and evidence of nonlocal individuals appearing at multiple sites, including one possible case of an individual who had been moved after death. These results emphasize the complex nature of human activities and the value of incorporating multiple lines of archaeological, osteological, geochemical, and ecological evidence for interpreting bioarchaeological data.

**Sharratt, Nicola (Georgia State University)**

[106]

*Crafting Continuity, Crafting Change: A Compositional Approach to Communities of Practice in the Moquegua Valley, Peru*

In many regions of the south-central Andes, the transition from the Middle Horizon to the Late Intermediate period was accompanied by significant disruption to regional sociopolitical and economic systems, including the organization of craft production and the long-distance circulation of craft objects. Ongoing research in the Moquegua Valley provides a nuanced, local level, and diachronic perspective on the lived experience of the almost five centuries that are bookended by the end of the Middle Horizon states (ca. AD 1000) and the beginnings of Inka imperial rule (ca. AD 1476) in the valley. Drawing on visual and compositional analyses (LA-ICP-MS) of ceramic sherds spanning these 500 years as well as a comprehensive chemical data base of clays from Moquegua, this paper seeks to identify the geographic and temporal scope of communities of practice in the valley. I suggest both that existing communities of practice were essential to continuing patterns of resource procurement and production that endured across generations despite localized population displacement, but also that emerging communities of practice were key participants in the reformulation of intravalley relations and networks.

**Shaw, Justine (College of the Redwoods) and Thania Ibarra Narvaez (Escuela Nacional de Conservación, Restauración y Museografía)**

[119]

*Everyday Life during the Late Terminal Classic in the Coahuah Region*

Following a peak in construction activity during the Terminal Classic, most of the 105 sites documented in the Coahuah Region in the central Yucatán Peninsula were abandoned with only a fraction boasting minor Postclassic activity in the form of small shrines and temples. However, at a number of settlements, a much-reduced population continued during a newly defined phase termed the Late Terminal Classic. During this time, in addition to open-fronted (C-shaped) structures, residents built small, round foundation braces and scavenged tools and ceramic vessels from earlier structures. Excavations of the round constructions have revealed a mix of cultural continuities and innovations as inhabitants struggled to continue in what would have been an extremely challenging and turbulent time period. The excavations are able to provide details about what everyday life was like through the patterning of soil chemistry, ancient starches, and artifact distributions in and around four of the round structures. This patterning is considered in comparison to a variety of archaeological and ethnographic examples and the methods used to consolidate and preserve these structures are also discussed.

Shaw, Matthew [151] see Phillips, Natasha

**Shaw-Müller, Kyle (University of Toronto, St. George Campus), John Walden (University of Pittsburgh), Qiu Yijia (University of Pittsburgh), Anaïs Levin (Cambridge University) and Julie Hoggarth (Baylor University)**

[152]

*Measuring Dimensions of Exchange and Economic Transition in Three Districts of Lower Dover, Belize*

Although Hirth's (1998) distributional approach has been recently applied to identifying markets at Classic Maya centers, much research still has yet to be done on the diversity and origins of Classic Maya modes of exchange. This picture is even less clear at small Late Classic (AD 600–900) Maya centers such as Lower Dover, Belize, where evidence for Hirth's configurational and contextual hypotheses is often ambiguous: the former requires clear architectural evidence of market exchange, while the latter is irrelevant to small polities. We analyze multiple household variables including artifact frequencies and architectural volume to assess the presence of a centralized marketplace through application of the distributional approach and to describe other shifts in modes of exchange for Lower Dover. The sample consists of 23 commoner and intermediate elite settlement groups spread over three districts. Univariate and multivariate analyses strongly suggest that market relations proliferated at Lower Dover in the Late Classic, and that other exchange relationships, including commensal modes of exchange, may have changed substantially. This study not only illustrates the exchange relationships of a small Classic Maya polity, but also employs a diversity of methods that may prove fruitful for further economic research.

[152]

Chair

**Sheets, Payson (University of Colorado)**

[138]

Moderator

**Sheets, Payson (University of Colorado)****[178]***Natural Disasters and the Avoidance of Complexity: Arenal Villages in Comparative Context*

Small sedentary villages were established by about 4,000 years ago in the Arenal area of Costa Rica. The egalitarian nature of internal organization continued until the Spanish conquest, with no evidence of significant inequality developing, socially, economically, religiously, or politically. However, they were subjected to occasional violent explosive volcanic eruptions from Arenal volcano. The larger eruptions forced evacuations, but villagers returned to their ancestral homes, and resumed pilgrimages to their cemeteries. They maintained a remarkable continuity of culture in spite of the stresses. A case where Ancestral Puebloans in the US Southwest reestablished egalitarianism after disastrous conditions is compared. Contrasts with the complex societies of Mesoamerica, particularly the Maya and Teotihuacan, are presented. They suffered more greatly than these two "simpler" societies beyond the boundaries of Mesoamerica. The advantages of small-scale societies facing unanticipated massive stresses are presented. Some of those advantages could be employed in hazard planning in present-day societies, to reduce risk, property damage, injuries, and deaths.

**Shelley, Nathan (Texas A&M) and Kelly Graf (Texas A&M)****[34]***A Preliminary Spatial Analysis of the Late Pleistocene Components at the McDonald Creek Site, Interior Alaska*

The McDonald Creek site (FAI-2043) is located about 30 miles south of Fairbanks, Alaska, in the Tanana Flats. Results of archaeological testing and excavations between 2013 and 2019 identified three distinct archaeological components, Components 1, 2, and 3 dating to about 13.8 ka, 12.7 ka, and 5 ka, respectively. Approximately 50,000 pieces of archaeological materials have been found in situ with three-point provenience, and most of these come from the earliest component. The high density of artifacts and features in the early components at McDonald Creek provide a rare opportunity to gain insight into site use, adaptive strategies, and settlement organization of these early inhabitants of Beringia. For this poster, we model the artifacts from Components 1 and 2 using ArcGIS and ArcScene to display both 2D and 3D maps of each component separately and in relation to each other. Then we use these models to document horizontal artifact clustering in relation to field-identified features to document activity areas and test the degree of vertical separation between components.

Shelley, Nathan [34] see Graf, Kelly

**Shephard, Christopher (Virginia Department of Transportation)****[163]***Material Bodies, Living Objects: Bodily Adornment and Death in the Algonquian Chesapeake*

This paper explores the relationship between the human body and the objects that adorned them within the Late Woodland through early colonial (AD 900–1680) Algonquian Chesapeake. Drawing on theories that cite the human body as the battle ground upon which political authority is established, I seek to explore the ways in which adornment objects (extensions of the body) were deployed to expand, counteract, or contradict human agency. Historic Algonquian interactions with shell and copper, tangible metaphors for birth and social action, demonstrate that these materials exhibited humanlike qualities and, at times, animated relations with the insentient (the skeletal remains of dead relatives, for instance). At the same time, these shifting animacies were bound up in the transformation of people and their bodies into something more akin to objects, as slaves, war trophies, and skeletal remains that were commingled, burned, or buried. Having witnessed burial ceremonies, the chiefly (re)distribution of shell and copper ornamentation, and rituals aimed at suppressing dangerous nonhuman actors, seventeenth-century English colonials knew the significance of beads and beadwork in the Powhatan political sphere. Efforts then were aimed at controlling these objects and by proxy, the Algonquian bodies that they adorned.

**Sherfield, Anne (Arizona State University)****[101]***Differential Access and Socioeconomic Inequality at Teotihuacan*

I investigate patterns of social and spatial inequality at Teotihuacan, Mexico. Differential access to civic resources is a well-documented mechanism of socioeconomic differentiation in historic cities and can be measured by analyzing movement within the built environment. I measure differential access at Teotihuacan by simulating movement pathways from residential structures to public facilities within the city. The locational data for this study was gathered from publications of excavated structures and the Teotihuacan Mapping Project's architectural survey. A hypothetical street network for the city of Teotihuacan is simulated from an axial map of the city. GIS-based spatial network analysis provides insight into pedestrian movement patterns within the city. Network distances between public facilities and residential structures are used to evaluate patterns of access within the city. This project shows the constraints that the urban environment had on the movements of individuals within Teotihuacan and whether differential access to public spaces may have contributed to creating and maintaining social inequality at Teotihuacan.

Sherfield, Anne [30] see Crawford, Trinity

Sherman, Diana [183] see McBrinn, Maxine

**Sherman, Simon (University of Memphis), Ryan Parish (University of Memphis), Philip Carr (University of South Alabama), Diana Greenlee (Poverty Point Station Archaeology Program) and Youngsang Kwon (University of Memphis)****[77]***A Re-evaluation of Surface-Collected Projectile Points or Knives from the Poverty Point (16WC5) Site Using Reflectance*

*Spectroscopy*

Nondestructive reflectance spectroscopy (VNIR-FTIR) was applied to 845 chert projectile points/knives (ppks) from the Poverty Point site (16WC5) in order to characterize the toolstone lithic networks utilized by the Late Archaic (4000–2500 BP) inhabitants of that site. This was the first systematic application of an archaeometric technique to identify the geological source of chipped stone at Poverty Point. Most of the analyzed ppks were sourced to the mid-south geographical region. However, some chert source identifications, based solely on the VNIR-FTIR measurements and subsequent statistical analyses, were considered suspect. In a follow-up blind study, two analysts with considerable knowledge of the lithic raw material sources of the region examined each artifact with respect to its visual characteristics and other relevant macroscopic information. After agreeing on the likely source, they assigned a confidence score ranging from 1 to 10 for each identification. These visual identifications are here compared with the VNIR-FTIR source determinations. By considering when and how the two techniques agreed or disagreed, we can identify potential problems that could arise during similar analyses. Clearly, improving the application of this nondestructive chert sourcing technique will strengthen our conclusions and provide a more accurate depiction of past lifeways.

Shillito, Lisa-Marie [95] see Holcomb, Justin

**Shimada, Izumi (Southern Illinois University), Haagen Klaus (George Mason University), Brandi MacDonald (MURR, University of Missouri), Kayeleigh Sharp (Southern Illinois University, Carbondale) and Ken-ichi Shinoda (National Museum of Nature and Science, Japan)**

[182]

*Defining the Organization of Middle Sicán (Peru) Governance*

What do the multiplicity and coexistence of monumental mounds commonly called huacas at a single site represent about group(s) that built them? Do these huacas symbolize distinct, unrelated (in terms of kinship), competing sociopolitical groups or, conversely, related, multiple lineages, or something else? These questions guide our ongoing research at the Middle Sicán capital of Sicán on the north coast of Peru. In essence, we aim to clarify the organization of Middle Sicán leadership. Six monumental huacas at the site were all built close in time (ca. 1000 CE) using the same construction method and materials, but have different configurations and dimensions. They all have an elite cemetery closely attached. Associated artifacts and art show that they all share the same religion. In this paper we discuss emerging results of the systematic, multi-pronged comparison of varied samples from two best-preserved huacas in regard to the technology and chemical composition (INAA) of fine ceramics, funerary customs, and bioarchaeological and stylistic-iconographic features. The first two analyses have already revealed some important differences. We highlight both differences and similarities between the two huacas and consider their implications for competing hypotheses regarding the nature and form of the Middle Sicán governance.

Shimada, Izumi [16] see MacDonald, Brandi

Shinoda, Ken-ichi [182] see Shimada, Izumi

**Shiratori, Yuko (Kyoto University of Foreign Studies) and Angel González López (North Carolina Museum of Art)**

[122]

*The Female Terracotta Sculpture at the North Carolina Museum of Art: Pastiche or Fake?*

Large-scale female terracotta sculptures were extensively produced in the Mixtequilla region of Veracruz during the Late Classic period. It is likely that numbers of these sculptures were looted and smuggled into the United States prior to the 1970 UNESCO Convention on Cultural Property. This paper focuses the female terracotta sculpture at the North Carolina Museum of Art (NCMA), which shows the characteristics of large-scale female terracotta sculptures from the Mixtequilla region. The authors examined the sculpture under natural and ultraviolet light, considering its aesthetics, visible restorations, and fragments, and conducted provenance research. The investigation also included an interview with Brígido Lara, the restorer at the Museo de Antropología de Xalapa, because the possibility of the NCMA sculpture being one of his creations had arisen. This presentation revisits and recalls Lara's forgeries of sculptures from Veracruz.

**Shott, Michael (University of Akron)**

[49]

*Discussant*

Shott, Michael [74] see Thulman, David

**Sides, Lauren (University of Arizona)**

[70]

*Visibility and Memory on the San Giuliano Landscape*

At the height of its occupation during the Etruscan period, inhabitants at the San Giuliano plateau in northern Lazio, Italy, constructed hundreds of rock-cut tombs in the surrounding escarpment, effectively creating a "city of the dead" adjacent to their city of the living. Intervisibility between the necropolis and plateau would place inhabitants of San Giuliano in constant visual contact with the deceased, functioning to incorporate shared understandings of cosmogony, the afterlife, and the mythic identities of the dead via memory into their daily lives. This paper examines conceptions of memory and social organization at San Giuliano through viewshed analysis between the necropolis and habitation area. Substantial changes to the vegetation and geology of the San Giuliano landscape since the Etruscan period make modern assessments of intervisibility unfeasible. However, viewshed analysis in

ArcGIS makes reconstructing intervisibility possible. Total and cumulative viewshed models revealed statistically significant visibility between the necropolis and eastern edge of the plateau. Furthermore, multiple viewshed analysis from clusters of tombs separated by location, style, and chronology reveals significant changes in intervisibility after the fifth century, evidencing ripples in San Giuliano social organization that correlate with regional shifts in Southern Etrurian economics and trade networks.

**Siebrecht, Matilda (Groningen University)**

[179]

*#Arctic: Social Media and the Communication of Arctic Archaeological Knowledge*

Public outreach is an essential part of Arctic archaeology, and the range of platforms available for the dissemination of data has developed significantly over the last decade. To ensure ethical accountability to Indigenous communities, policy makers, and funding bodies, the relevance of archaeological research must be shared with the wider public. This is especially true in Arctic regions, where the majority of archaeological information is (or should be) relevant in some way both to Inuit cultural heritage and current issues in Inuit communities. Archaeologists therefore have a moral obligation to both ensure that their research contributes to modern-day issues and share their data and results with those that are impacted. The digital opportunities for facilitating such outreach has developed significantly since the earliest discussions of "digital public archaeology," as has internet connectivity in Inuit communities, and the online presence of society in general. Familiarity with the media-consumption habits and needs of particular groups is therefore important, as is an understanding of how social media can be used to share and highlight current archaeological research. This presentation aims to provide an overview of current dissemination opportunities that can aid researchers in the communication of Arctic archaeological knowledge through these updated platforms.

[179]

Chair

**Siebert, Courtney (Texas State University), Nicholas Herrmann (Texas State University) and Todd Ahlman (Texas State University)**

[32]

*Geophysical Investigations of Eighteenth- and Nineteenth-Century Sites on Sint Eustatius, Dutch Caribbean*

Sint Eustatius served as a free port in the late seventeenth century, enabling the island to prosper in an evolving global economy. To better understand the role Sint Eustatius played in globalization, archaeological assessments have occurred at SE094 (Fort Amsterdam), SE095 (historic plantation), SE127/410 (Lazaretto), and SE600 (unmarked cemetery). These investigations were conducted to locate the extent and integrity of any prehistoric and historic archaeological sites on the property for continued preservation. Geophysical investigations, including ground-penetrating radar (GPR) and gradiometry, were conducted in 2017 and 2019 to locate subsurface structures or features, including the possible location of the village associated with the plantation's enslaved community. GPR data were collected using a 400 mhz antennae and the gradiometer data was recorded using a single axis fluxgate gradiometer. Although most commerce on the island revolved around free trade, several plantations were in operation on the island and were largely supported by the enslaved community. This data contributes to our understanding of site use and the role the plantation played during the colonial period and provides insight into the lifeways of the individuals which contributed to the island's wealth.

Siebert, Courtney [32] see Karastamatis, Kallista

**Silva, Fabiola and Lorena Garcia (Universidade Federal de Sergipe)**

[66]

*Landscapes of the Mid-Low Xingu: Archaeology, Temporality, and Longue Durée Indigenous Stories*

This presentation deals with the archaeological research carried out in the indigenous land Koatinemo, together with the Asurini do Xingu Indigenous people. From this experience, a reflection on the temporality of the landscapes and on the *longue durée* Indigenous stories of the mid-low Xingu region was performed. Two horizons of reflection were combined on the approach. The first one deals with persistent places interconnected with the experience of living in the places, the contact with the historical narratives, and the Asurini's oral tradition. The second one concerns the artifactual landscape that has been materially transformed over the time and consists of visible marks left by different human activities throughout the time. In methodological terms, the study applies techniques of archaeological survey and analysis of ceramic collections from the identified archaeological sites in the referred Indigenous land. At the end, the communication presents a contribution on current knowledge about the Indigenous ancestry of the landscape and the way it is related to the history of the Asurini and of the populations of Juruna and Karib languages from the mid-low Xingu.

**Silverstein, Jay (School of Advanced Studies, University of Tyumen), Robert Littman (University of Hawai'i) and AbdelRahman Medhat (GEM)**

[96]

*Uncommon Scents: The Greco-Roman Fragrance Industry at Thmuis, Tell Timai, Egypt*

Ancient sources reference the quality and importance of perfume manufactured in the Mendesian nome through the periods of Hellenistic and Roman control of Egypt. Archaeological evidence has identified areas of manufacture for Greek-style *lekythoi*, Roman Unguentaria, and possibly a location to produce incense at the site of Tell Timai that dates to the period of Cleopatra VII. Sourcing analysis has demonstrated that special clay was imported from a great distance suggesting an extensive network of trade and possibly an investment in the magical properties of perfume bottles. Experimental archaeology has resulted in the recreation of the Mendesian perfume bringing the famous fragrance back to life. A picture of an extensive multinational network involved in the manufacture, marketing, and distribution of Mendesian perfume indicates an industry that spanned the Mediterranean world.



**Simon, Rebecca (History Colorado - OAHP)****[75]***Discussant***Simon, Rebecca (History Colorado - OAHP)****[160]***Discussant***Simon, Rebecca (History Colorado - OAHP)****[187]***Discussant*

Simonetti, Renato [98] see Cartajena, Isabel

**Simova, Borislava (Tulane University)****[61]***Tracing the Relationship between E Groups and Emerging Social Integration at the Site of Actuncan, Belize*

One of the earliest known examples of permanent architecture in the Maya Lowlands, a distinctive plaza-structure complex known as an E Group, is also one of the most commonly encountered architectural groups present within Preclassic sites throughout the region. The rapid adoption of permanent architecture and widespread standardization in its form suggest incredible intraregional integration within the Lowlands, but the nature of this integration remains an important topic of discussion. This presentation reviews techniques and data generated from the E Group at the site of Actuncan, located in the Mopan River valley of Belize, for the examination of local community integration. The construction history of Actuncan's E Group indicates the presence of local antecedents to the formal complex. Through each phase of occupation, how can the construction techniques and uses of the architectural group inform our understanding of the developing local community? Which practices were innovated with the growth of the complex and which indicate long-standing connections within the river valley? This approach offers an opportunity to study the changing arrangement and uses of the constructed space and develop a case study for the role of architecture in anchoring local communities and promoting social integration at multiple scales.

**Simpson, Diana (University of Nevada, Las Vegas)****[127]***Beyond the Brutality: Ritualized Violence in the Archaic Period Southeast*

The Archaic period of the southeastern United States is characterized by major environmental and ecological changes that likely stimulated ideological changes visible in the archaeological record. This period also demonstrates widespread direct violence that transcends ecologically based explanations. In particular, the contradictory lack of defensive architecture in tandem with compounding evidence for widespread trophy taking and killings suggest a deeper meaning behind these violent actions. Focusing on shell burial mound sites within the Middle Tennessee River Valley of Alabama, this research investigates how violence emerged and was ritualized during the Archaic period and how this contributed to transformations in broader cultural processes within these groups. As Dr. Martin's student, I am constantly encouraged to employ a well-rounded multidisciplinary approach, using a fine-grained biocultural analysis to interrogate ritual violence in a more nuanced way focusing on lived experience, performance, and culturally specific patterns. This approach to research that Dr. Martin embodies and trains her students in allows my work to make significant contributions both to our understanding of how ritual violence was enacted within these southeastern groups and to a growing anthropological literature on the complex ways that ritual violence is embedded in ideology and daily practices through time and space.

**Simpson, Erik (Bureau of Land Management, Farmington Field Office)****[46]***Rethinking the Pueblo II Period in the Upper San Juan Region of the American Southwest*

The Upper San Juan region of northern New Mexico and southern Colorado is an area of unique cultural developments related to, but differing from, the adjacent Chaco, Mesa Verde, and Rio Grande regions. Our knowledge of both internal developments and status of relations with external groups is poorly understood in comparison to those neighboring regions. This is especially true for the Pueblo II period (AD 950–1100) where most research has focused on the northernmost edge of occupation and often in the context of Chacoan intrusion at Chimney Rock Pueblo. There are two distinct and contemporaneous Upper San Juan occupations (northern and southern) by peoples with shared identities and cultural roots in the preceding Pueblo I period (AD 700–950). Summaries of these populations are presented along with chronological indicators for properly identifying southern Pueblo II period sites. This presentation explores the differences in northern and southern Upper San Juan populations and how their amalgamation resulted in formation of the Classic Gallina culture of the twelfth and thirteenth centuries.

Singh, Ravindra Nath [123] see Bates, Jennifer

**Singleton, Robin (University of Oklahoma), Karissa Hughes (University of Oklahoma), Ron Van Den Bussche (Oklahoma State University), Nawa Sugiyama (University of California, Riverside) and Courtney Hofman (University of Oklahoma)****[30]***Captive Management and Sacrificial Power: Using Ancient Genomics to Study Animal Sacrifice in Teotihuacan*

Excavations of the Moon and Sun Pyramids (1998–2004) at Teotihuacan have yielded both human and animal sacrifices, interred as part of state rituals. These rituals demonstrated the power of the state, and the species chosen reflected that power. Isotopic and zooarchaeological analyses of the sacrificed animals show that some of them were held for extended periods of time before their deaths—they have skeletal lesions associated with restraints and evidence of maize based diets—while others were sacrificed fairly quickly. We conducted genomic analysis on golden eagle (*Aquila chrysaetos*) remains that were sacrificed and interred in Teotihuacan to determine the relationships among sacrificed individuals and compared them with extant populations. These relationships provide insight into how the eagles were procured and managed before sacrifice. By investigating the resource cost for obtaining and keeping these animals for sacrifice, we can improve our understanding of the ritual economy in Teotihuacan and the greater Mesoamerican region.

**Sion, Julien (ArchAm-CEMCA), Jennifer Arguijo (Universidad Nacional Autónoma de Honduras), Divina Perla-Barrera (Universidad Autónoma de Yucatán), Ricardo Rodas (Universidad San Carlos de Guatemala) and Antolín Velásquez (Universidad San Carlos de Guatemala)**

**[132]**

*Reorganización socio-política entre lago y montañas: El sitio de Los Naranjos y la cuenca de Yojoa durante el Postclásico Temprano*

Durante la transición entre Clásico y Postclásico (siglos IX-XII dC), se observan notables cambios en las dinámicas de ocupación y la organización socio-política de los sitios del Noroeste de Honduras, así como en las redes de intercambio a larga distancia con la Zona Maya o la Gran Nicoya. Sin embargo, debido a las dificultades para localizar los asentamientos posteriores a la caída de los grandes centros de poder clásicos, este período sigue siendo poco comprendido. Es en la perspectiva de estudiar las reorganizaciones de las sociedades en esta región fronteriza que se decidió investigar el sitio de Los Naranjos en la Cuenca del Lago Yojoa, considerada como un cruce natural entre varias zonas de Honduras y como el límite sureste de Mesoamérica. Los trabajos anteriores realizados en esta área sugerían que a partir del final del Clásico existió una ruptura drástica en el patrón de asentamiento, lo que confirman los resultados preliminares de PARYNA que demuestran también que la ocupación de este período de transición era más importante de lo que se consideraba hasta ahora, ya sea dentro del sitio de Los Naranjos o en el territorio cercano, en particular en la Montaña de Santa Bárbara.

Sion, Julien [181] see Lemonnier, Eva

Sipes, Eric [187] see Gordon, Falcia

**Sirak, Kendra (Harvard Medical School) and Jakob Sedig (Harvard Medical School)**

**[55]**

*Exploring Male Sex-Bias in Ancient DNA Research*

Preliminary research and anecdotal evidence suggest that there is an overrepresentation of male samples relative to female samples in published ancient DNA research; however, the reason behind this bias is poorly understood. In this paper, we quantify this sex bias within an ancient DNA database of 3,365 individuals for whom sex was reliably assigned. We compare sex calls made using molecular methods to osteological sex assessments, exploring their rate of agreement. We find that ~58% of individuals were sexed as male using molecular methods, and that this is most often consistent with the osteological assessment. We then explore possible explanations for male bias, including some discrepancy between osteological and genetic sex calls that introduces an unforeseen bias, superior preservation of more robust male skeletons, preferential burial treatment of male individuals in the past (e.g., males buried in more prominent positions), intentional sampling bias introduced by researchers (e.g., preferencing male individuals in order to obtain Y chromosome data), and a higher sequencing success rate for male individuals for reasons that are unclear. This research aims to clarify if male overrepresentation is the result of research design and methods, and therefore correctable, or reflective of ancient cultural practices.

**[55]**

*Chair*

**Sitek, Matthew (University of California, San Diego; St. Cloud State University)**

**[182]**

*Communities in the Campo: Household Excavations at a Tiwanaku Frontier Settlement in the Middle Locumba Valley, Peru (ca. AD 500–1100)*

In this paper I present preliminary findings from extensive household excavations at the large multicomponent site, Cerro San Antonio (L1), in the middle Locumba Valley in southern Peru. While the site represents a valuable dataset for nearly all periods of Andean prehistory, this current research has targeted domestic remains with clear affiliations to the Tiwanaku polity, which influenced much of the south-central Andes during the Middle Horizon (ca. AD 500–1100). Defined by three separate domestic sectors, the Tiwanaku occupation at Cerro San Antonio appears to be one of the largest settlement enclaves outside Tiwanaku's highland center over 200 km away in Bolivia. Taking a holistic approach to the domestic assemblage this paper will present initial results from ceramic, lithic, faunal, botanic, and textile analysis coupled with detailed built environment and other context-driven spatial data. Excellent material preservation, shallow deposits, and a detailed, micro-context excavation strategy have yielded an unprecedented view into the domestic activities and community practices that defined the daily lives of the site's Middle Horizon occupants. This will be a powerful comparative dataset for those studying the Tiwanaku polity and daily life in the ancient Andes more generally.

**Skaggs, Sheldon (Bronx Community College CUNY), Adam King (University of South Carolina), Christina Luke (Koç University), George Micheletti (University of Central Florida) and Terry Powis (Kennesaw State University)**

**[116]**

*Place-Making, Erasure, and the Death of Kingship at the Ancient Maya Site of Pacbitun, Belize*

During the Late Classic period (550–800 CE) at Pacbitun, a sequence of events took place that changed the landscape of power and sacredness in the site's core during a tumultuous time in the Belize River Valley. The sequence of caches and burials likely began in order to consecrate a new courtyard (Court 3) and establish the new center of power at the site. These were dedicatory offerings that established the new court as the locus of new royal activity. At some point during the Late to Terminal Classic period (800–900 CE), similar dedicatory offerings and burials were placed to the west of the central cache. Sometime after these new offerings were incorporated into the sacred landscape of Court 3, they were disturbed. The area was burned and neither the burials nor artifacts were covered up by later construction. Presumably the dedicatory offerings from this new royal line were desecrated, and Court 3 was abandoned, signaling the likely end to kingship at Pacbitun. We intend to explore how the processes of dedication, rededication, and desecration are visible in the other aspects of Pacbitun's built environment, and how life in the hinterlands changed as power changed hands as kingship ended.

**Skosey-LaLonde, Elena (University of Connecticut; ICAREHB), Mussa Raja (Universidade do Eduardo Mondlane, ICAREHB), Gideon Hartman (University of Connecticut), Nuno Bicho (ICAREHB) and Ana Gomes (ICAREHB)**

**[68]**

*Paleoenvironmental Conditions of Holocene Southern Mozambique: Multiproxy Data from Coastal Lake Nyalonzelwe Cores*

To understand the role climate played in facilitating the development and expression of human behaviors, our interdisciplinary research team cored the interdunal Nyalonzelwe lake (Inhambane coast, southern Mozambique) during the summer of 2019. Lake Nyalonzelwe sits 5 m above MSL and is sheltered from the Indian Ocean by a Pleistocene dune system. Its sedimentological record presents over 6 m of stratigraphic variability, including a varve sequence spanning the basal 2 m, making it an incredibly rare record of seasonal resolution climatic variability. This multiproxy approach uses both malacological samples and elemental (CNH) approaches to analyze bulk sediment. Dominant mollusk species *Melanoides tuberculata*, *Bellamya* sp., *Eussoia* sp., *Bulinus* sp. and *Macra* sp., were imaged using a desktop SEM system, and their calcite:aragonite ratios were determined using ATR-FTIR, creating an intimate look at the environmental parameters of these fresh and brackish water specimens' postmortem environments. Together, these data present a unique signature of paleoenvironmental variability during the last 7500 cal BP years of southern coastal Mozambique, recording signals of human-environmental interactions, and illuminating the importance of climate research in the region. This work was supported by the project PTDC/HAR-ARQ/28148/2017 (Portuguese Science and Technology Foundation).

**Skosey-LaLonde, Elena (University of Connecticut; ICAREHB)**

**[185]**

*Discussant*

Slade, Alan [74] see Thulman, David

**Slatowski, Jenna and Lori Lee (Professor)**

**[184]**

*Low-Fired Ceramic Chronologies at Fort Mose*

Fort Mose was the first free black settlement in the United States, built in Spanish territory on land previously occupied by the Eastern Timucuan. This paper explores the ceramics of Fort Mose and delves into the chronology of site use based on ceramic types. Indigenous ceramics and colonoware provide insight into the presence and cultural interaction of different cultural groups at Fort Mose. By considering the prehistory and history of the indigenous peoples in the area and free African Americans who lived at the Fort, we can piece together the social and economic contexts of ceramic producers and users.

**Slovak, Nicole (Santa Rosa Junior College)**

**[182]**

*The Middle Horizon Period at Ancón: A Reassessment*

Ancón, Peru, represents one of the largest precolumbian cemeteries in the Andes. Discoveries of more than 3,000 burials spanning the length of Andean history cement Ancón's continuous role as an important location to commemorate the dead. Less clear, however, is whether Ancón supported a concurrent residential population throughout this time, particularly during the Middle Horizon. The traditional narrative holds that Ancón was home to a permanent settlement beginning in the Middle Horizon—perhaps even serving as a Wari outpost. A reexamination of data from Middle Horizon Ancón contexts, however, suggests that the site functioned primarily—if not exclusively—as a cemetery during this period and that Wari influence was minimal. Additionally, a review of Middle Horizon Ancón burials demonstrates that the overwhelming majority date to the latter part of the Middle Horizon. All of this indicates that Ancón was largely abandoned as a place of residence at the end of the Early Intermediate period, serving instead as a small cemetery at the start of the Middle Horizon. The site surged as a major cemetery toward the end of the period, and transformed yet again at the start of the LIP into a permanent habitation site.

Smallwood, Ashley [74] see Jennings, Thomas

**Smeeks, Jessica (Binghamton University) and Rebecca Spring (TRC Companies Inc.)****[118]***Enemies and Allies: GIS Analyses of Late Intermediate Period Defensibility and Settlement Patterns in the Huamanga Province of Peru*

Warfare theorists argue that scholars must move beyond social evolutionary theories and realize that warfare and sociopolitical organization are not autonomous and self-regulating; one cannot be understood in isolation from the other. Instead, scholars need to focus on the interrelationships between and interdependency of military infrastructure and societal structure. Only through the analysis of this interrelationship can scholars begin to understand warring societies across time and space. The Peruvian Late Intermediate period (LIP; AD 1000–1450), the period between the collapse of the Tiwanaku and Wari States and the rise of the Inca Empire, is an ideal time period to study this relationship, as it has often been characterized as a time of violent conflict and social strife. This paper uses geographic information systems (GIS) analyses to consider how defensive practices and regional site organization changed throughout the LIP in the former core of the Middle Horizon (MH; AD 600–1000) Wari Empire—the Huamanga Province of Ayacucho, Peru. GIS analyses at the regional level evaluate the relationship between hilltop sites, examining spatial distribution, ceramic distributions, and sensory connections (intervisibility). Meanwhile, site-level analyses assess site defensibility, focusing on movement analysis (accessibility) and visibility analysis (visual range and invisibility to outsiders).

Smeeks, Jessica [16] see Spring, Rebecca

**Smith, Alexander (SUNY Brockport)****[184]***Frost Town Archaeology 2019–2020: Pedagogy and Public Practice*

Frost Town Archaeology (FTA) is a historical archaeological project through SUNY Brockport and the Rochester Museum and Science Center that explores the site of Frost Town, a once thriving logging area that was gradually abandoned during the early twentieth century. FTA examines the environmental devastation of the Euro-American presence in the Finger Lakes region, as well as the social dynamics that developed out of the logging industry. The first field school season was launched in 2019. For three weeks the team excavated the Hall Residence, a mid-nineteenth-century house foundation that was abandoned around 1913. The undergraduate students who attended were taught archaeological methods and then asked to teach those methods to 12–15-year-old campers during our final week of work. This paper will discuss the results from FTA's 2019 season, including the lessons learned from pushing field school students to engage in public archaeology with younger audiences. Since the summer of 2019, efforts have continued at Frost Town, though significantly reduced because of COVID-19. This paper will discuss the limits of public archaeology, the impact of the pandemic, and the future of Frost Town Archaeology in 2021.

**Smith, Allison (University of Alabama) and Elliot Blair (University of Alabama)****[137]***A Social Network Exploration of Models of Social Space and Community Organization at Moundville*

Moundville is one of the largest Mississippian sites in North America consisting of at least 29 earthen mounds positioned around an open plaza. Numerous researchers have remarked on the regularized spatial layout of the site, arguing that the formal arrangement of the mounds and plaza reflect social organization at the site. No fewer than four detailed models have been proposed to explain the social aspects of this formal arrangement, though most researchers now subscribe to a model that argues that the layout of the mounds closely resembles the spatial arrangement documented among the historic Chickasaw, where kin groups allocated space around a political authority based on rank. In this paper we use the methods of social network analysis to evaluate the competing models for the organization of social space at Moundville. Ceramic data, including sherd counts and modes, from all central and periphery mounds were used to establish network ties. Initial results suggest most mounds are closely tied; however, at least one mound, Mound P, demonstrates significant separation from the other mounds. This implies a distinct contrast that may not be addressed by previous models of the formal layout of Moundville.

**Smith, Geoffrey (University of Nevada, Reno)****[95]***Discussant*

Smith, Geoffrey [27] see Bradley, Erica

Smith, Geoffrey [95] see Sturtz, Sara

**Smith, Gerad (University of Alaska Fairbanks)****[19]***Household Archaeology of Shaw Creek, Alaska*

This study compares the remains of two prehistoric houses to those of the protohistoric past. Each housepit represents a different archaeological tradition, dating roughly to 1,000 and 2,000 years ago. If house features represent a stable material culture correlate reflecting a culture's core concept of the family unit, the comparison allows us a viewpoint of how that changed through time. Past findings suggest that rising local demographics and a shifting resource base influenced a change in land-use practices, resulting in intensified territoriality, reduced regional movements, increased seasonal sedentism, and increased use of materials only available with a band's territory. These changes are reflective in the shifting concept of the household, which changes from one containing only small, natal families ~2,000 years ago, to households hosting two natal families by ~1,000 years ago.

Smith, Heather [74] see Jennings, Thomas

**Smith, Jaye and Jeffery Clark (Archaeology Southwest)****[46]***Citizen Science in Action: Preserving the Ray Robinson Collection from the Safford Basin, Arizona*

In 2015, centenarian Ray Robinson wanted to find a permanent home for thousands of artifacts he collected from numerous sites in the Safford Basin, Arizona, during the late 1950s and 1960s, including items from the Bonito Creek Cave Cache. 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. In 2018, Archaeology Southwest assembled a team of over 30 citizen scientists to prepare the collection and process the artifacts to a "repository-ready" state for permanent storage at ASM. During 2018/2019 lab sessions, the Robinson Collection Team, with the assistance of Archaeology Southwest's Preservation Archaeologists, inventoried and identified artifacts from the "Cork Site," a previously undocumented Salado site in the Safford Basin. The Safford Basin was a vibrant cultural crossroads in the late prehispanic era (1200–1450 CE), and there are few documented collections from this region. Collections from this site and others represented in the Robinson Collection fill an important gap in Salado knowledge. This paper will give a brief overview of the history of the Ray Robinson Collection, the importance of citizen scientist participation, and the preliminary results of artifact processing of the "Cork Site" assemblage.

**Smith, Karen (South Carolina Department of Natural Resources)****[153]***Celebrating the Design Work of Bettye J. Broyles*

Like many archaeologists, the late Bettye J. Broyles discovered what she wanted to do in her twenties while enrolled in college. It was there where Broyles's archaeological career began to take shape, and by summer of 1954 she had embarked on her first field school. Broyles went on to do archaeology in Georgia, North Carolina, West Virginia, Mississippi, and Alabama, eventually returning to her Tennessee roots in the 1980s. Indeed, the details of much of her life were penned by Hester A. Davis and featured in the aptly named book *Grit-Tempered: Early Women Archaeologists in the Southeastern United States*. My interests concern Broyles's pottery design work, only briefly described in *Grit-Tempered*. Though only one publication resulted from her efforts to reconstruct Southeastern paddle stamped designs—an article that appeared in a Southeastern Archaeological Conference Bulletin—Broyles's design work has served as a legacy and inspiration to those who have followed. In this paper, I discuss Broyles's approach to design reconstruction and some of the insights she gleaned from it. I then describe recent work on a software program that seeks to reveal the design patterns that Broyles so carefully documented.

**Smith, Kevin (Haffenreffer Museum, Brown University) and Gudmundur Ólafsson (National Museum of Iceland, Retired)****[148]***Of Monsters and Men: Material Culture, Movement, and Symbolism at Surtshellir, a Western Icelandic Viking Age Ritual Site*

Over the course of 850 years, Surtshellir—a massive lava cave in western Iceland's rugged interior—was variously described as a geological wonder, a shelter for outlaws, an abode of ghosts and spirits, a tourist's dream, a place of torture, the wilderness, an archaeological site, and the home of Surtur, destroyer of gods and men. Focusing on data gained from excavations inside the cave in 2012 and 2013, this paper considers how the site's material culture assemblage and expanded suite of radiocarbon dates affects (re)interpretation of the site and, in turn, what Surtshellir's archaeological record suggests about Norse mythology, ritual practice, and the roles of Norse elites in early Icelandic society. We examine, in particular, evidence gained from pXRF analyses of objects recovered from the cave, what these objects suggest about the status of those who gathered there, and what they tell us about those individuals' movements to, and within, the cave's dark zone. Turning to the places of origin, colors, and symbolism of the objects left within the cave, we will consider what was chosen and what was avoided when objects were selected for use and sequestration inside this uniquely important, subterranean Viking Age ritual site.

**[148]***Chair*

Smith, Kevin [148] see Marengère, Véronique

Smith, Laura [153] see Harle, Michaelyn

**Smith, Maria (Syracuse University) and Alex Garcia-Putnam (University of Wyoming)****[147]***Behind the Man of "Pro and Profit": Weaving a Colonial City from the Obraje de San Marcos de Chincheros*

During the early Colonial period in Peru Antonio de Oré, a native of the Canary Islands, moved to Peru in hopes of finding fame and fortune. In the 1570s Oré established the Obraje (textile mill) de San Marcos de Chincheros (ca. AD 1570–1823) outside of Huamanga (Ayacucho). At the *obraje* the mainly indigenous workforce was forced to produce large quantities of textiles for little compensation. Through his exploitative business practices Oré was able to make substantial financial contributions to the growing city of Huamanga, through which he gained a reputation as a man "of pro and profit" (Salas 1979). Pro, because of his charitable contributions to the foundation and support of Catholic convents and churches in the city; profit, because of the wealth he amassed through his unacknowledged exploitation of indigenous communities, wildlife, and natural resources. In 2019 excavations were undertaken at the Obraje de San Marcos de Chincheros. Through the preliminary analysis of artifacts from the *obraje*'s workshops, dormitories, and cemetery, this paper examines the ways in which rural indigenous laborers, wildlife, and natural resources contributed to the growth of urban colonial communities.

**Smith, Michael (Arizona State University) and Aundria Arneson (Arizona State University)**

[11]

*The Growth Trajectories of Mesoamerican Cities*

[WITHDRAWN]

**Smith, Michael (Arizona State University)**

[104]

*Discussant*

Smith, Michael [101] see Blumenfeld, Dean

Smith, Michael [30] see Crawford, Trinity

**Smith, Monica (UCLA)**

[94]

*Discussant*

Smith-Guzmán, Nicole [178] see Sharpe, Ashley

**Snitker, Grant (USFS, Southern Research Station), Sean Bergin (Arizona State University) and Pete Cadena (Okanogan-Wenatchee National Forest)**

[10]

*R-Based Solutions for Synthesizing Cultural Resource Survey Data to Assess Changing Land-Use Patterns in the Okanogan-Wenatchee National Forest, WA*

Archaeological research has benefited from decades of site-specific projects, regional comparisons, and theory building from case studies. However, recent research themes concerning the emergence of complex social-ecological systems and long-term land-use legacies require new approaches to archaeological data. Large-scale syntheses of archaeological, paleoenvironmental, and geographical information provide an effective way forward to address these themes. In more concise terms—"big questions" often require "big data" to help answer them. Cultural resource data collected by the US Forest Service is one such "big dataset" and represents an incredible investment in time, resources, and expertise. This poster presents the initial results of a pilot study to develop an R-based workflow to digitize, extract, and synthesize USFS archaeological information across the entirety of the Cle Elum Ranger District, within central Washington's Okanogan-Wenatchee National Forest. Our results indicate that synthesizing district-level archaeological data reveals patterns of land-use and survey coverage that were otherwise not recognizable. This work has the potential to not only strengthen this dataset's role in forest-wide cultural resource management but also to reposition cultural resources as a valuable tool in creating knowledge and developing policy with direct influences on the health of human-environmental relationships in the future.

**Snitker, Grant (USFS, Southern Research Station)**

[165]

*Moderator*

**Snow, Meradeth (University of Montana) and Michael Searcy (Brigham Young University)**

[55]

*Migrating Genes, or How to Avoid the Free-Ranging Genome*

Migration studies address huge distances, such as the colonization of the Americas, and smaller regions, such as the peopling of specific sites. The use of genetics as a medium to enhance our understanding of population movement can be an asset. There are potential pitfalls, however, such as the misrepresentation of DNA freely ranging across the landscape without the aid of human vectors or motivations. Genomic data must be interpreted through the lens of all available data from the site and surrounding region to best understand how it fits into human movement. These ideas will be discussed with the mitogenome data accumulated from the site of Paquimé in Casas Grandes, Mexico, which has long been tied to hypotheses of migration from the south (such as the *pochteca*) and north (such as the *Mimbres*). How such migrations are identified genetically and fit into the larger understanding of the site will be discussed, particularly in respect to the cultural fluorescence that marks the transition from the *Viejo* to *Medio* time periods. While mitogenome data points to in situ population growth, there is evidence that fits with the archaeological record that individuals were migrating into the region from both the north and south.

**Snow, Susan (San Antonio Missions National Historical Park), Lynn Kim (University of Texas, San Antonio) and Steve Davis (Journal of Texas Archeology and History)**

[140]

*Beta Testing a New Gunflint Database Using Citizen Scientists in the Time of COVID*

The *Journal of Texas Archeology and History (JTAH)* has developed a comprehensive new program for recording gunflint attributes (50+ potential) and site data (40+ items) based on a set of universal standards, taxonomy, methods, and procedures that allow a cloud-based, open-access comparative database to be constructed comprised of North American artifacts. In 2018 San Antonio Missions National Historical Park was approached by *JTAH* to serve as a beta test site for the North American Gunflint Database Project (NAGDP). The park agreed to participate utilizing its Citizen Scientist program with community member volunteers. This paper discusses beta test results from the perspective of engaging citizen scientists in complex lithic analysis as well as difficulties encountered due to the COVID-19 pandemic. It will discuss the next steps in the project from the standpoint of continued

improvement to the NAGDP based upon user feedback derived from the NPS beta test and methods that the new analytical data may be employed to further understand human interactions at the San Antonio Missions and South Texas, especially in the area of "locally manufactured/local material."

**Soares, Justin (University of Iowa) and Rui Mataloto**

[10]

*Metallic Motivations? Using GIS to Determine the Role of Metal and Mineral Resources in Changing Settlement Location Preferences between the Bronze and Iron Ages in Evora, Portugal (2200 BCE–400 CE)*

Bronze Age settlements in the Evora district of Portugal are typically located in rocky terrain with an apparent preference for locations in the highlands. During the Iron Age we see a shift of this settlement pattern, as highland sites are abandoned and new settlements appear at lower altitudes. Was the initial selection of highland sites influenced by the availability of metallurgical resources, particularly copper or tin, at the summits of these mountains? This paper uses GIS to analyze known Bronze and Iron Age settlements and metal and mineral distribution in the region to determine if a correlation exists settlement location and metal resources. Specifically, is there a relationship between the location of Bronze Age settlements and copper and tin, and did the introduction of iron in the first millennium BCE diminish the usefulness of such sites, therein leading to their abandonment and the establishment of new settlements closer to iron resources? While there are, no doubt, multiple factors to consider in understanding the factors behind settlement relocation, determining the role of metal and mineral resource availability is worthy of particular attention given the technological changes of this time.

Soe, Nyein Chan [150] see Macrae, Scott

Sol-Castillo, Felipe [178] see Murillo-Herrera, Mauricio

**Soler-Arechalde, Ana (UNAM), Laura Beramendi-Orosco (UNAM) and Galia González-Hernández (UNAM)**

[50]

*Archaeomagnetic Studies in Xalla: Contributions to the Chronology of Teotihuacan*

The results of three sampling stages carried out in Xalla, a neighborhood with the Teotihuacan government offices under the direction of Dr. Manzanilla in 2001, 2003, and 2012 are presented. A total of 28 archaeomagnetic samples were taken and processed in the Laboratory of Paleomagnetism of the UNAM. Secular variation curves of the geomagnetic field for that area of the country were constructed with data from Wolfman (1990), Hueda et al. (2004), Soler et al. (2006), Hernandez-Avila (2005), Romero (2008), and Terán (2013). The new data used in the curves have been corroborated by radiocarbon dating. Bayesian statistics were employed for archaeomagnetic dating. Ten dates have been obtained, one Miccaotli, one Tlalmimilolpa, and eight Xolalpan, two of which correspond to the great fire that caused the abandonment of the city. The data is compared with the chronology proposed by Beramendi et al. (2009) with data from Teopancazco and other chronological series from the central neighborhoods of Teotihuacan.

Soler-Arechalde, Ana [50] see Beramendi-Orosco, Laura  
Soler-Arechalde, Ana [50] see Rosado-Fuentes, Alejandro

Solís, Reyna [50] see Melgar, Emiliano

**Somerville, Andrew (Iowa State University), Isabel Casar Aldrete (Universidad Nacional Autónoma de México), Daniel Dalmás (University of Utah) and Pedro Morales (Universidad Nacional Autónoma de México)**

[72]

*Investigating the Pleistocene-Holocene Transition in the Tehuacan Valley of Mexico: New Dates and Isotopic Data*

The dry caves and floodplain archaeological sites of the Tehuacan Valley in Puebla, Mexico, excavated by Richard S. MacNeish and his team in the 1960s, contained some of the earliest macrobotanical evidence for domesticated New World plants, including maize, avocados, and chili peppers. While many studies have focused on the levels associated with these domesticated cultigens, less attention has been paid to the earliest deposits of the caves, which according to the excavators, spanned the Pleistocene-Holocene boundary. Here we present new AMS radiocarbon dates from the lowest levels of Coxcatlan cave (Ajuereado and Riego Phases) and stable isotope data from faunal bones ( $N = 200$ ) from nine site locations within the valley to document the timing of human occupation and to reconstruct the ecological contexts in which the early inhabitants lived. The AMS dates give us a new early date for cultural sequence in Tehuacan and the stable isotope results allow us to reconstruct environmental changes over time. These data increase our ability to model human adaptations to the post-Pleistocene environments in Mexico and help us understand how such adaptations may have led to increases in sedentary lifeways and ultimately to the origins of agriculture.

[72]

*Chair*

**Somerville, Andrew (Iowa State University)**

[161]

*Discussant*

Somerville, Andrew [177] see Forest, Marion  
Somerville, Andrew [68] see Royer, Julien

Sommer, Christian [151] see Bader, Gregor

Son, Pham Thahn [74] see Marwick, Ben

**Sorresso, Dominique (University of Florida)**

**[125]**

*Establishing Provenance and Population Movements of the Vacant Quarter Phenomenon through Ceramic Traditions*

The Vacant Quarter is a phenomenon that involved the movement of hundreds, possibly thousands, of sedentary communities in mid-continental North America during the Mississippian period (~AD 1450–1550). Many of the details surrounding this phenomenon are still debated. This study narrows in on two subregions of the Vacant Quarter: (1) the Upper Tombigbee River drainage in Mississippi and Alabama and (2) the Middle Cumberland River drainage in Tennessee. This pilot study analyzes an assemblage of shell-tempered ceramics from multiple archaeological sites in these two subregions. Petrographic analysis is used to determine provenance as well as to understand whether elements of the ceramic manufacturing process were consistent between sites. Ultimately, these analyses will shed light on subregional differences in population flows prior to the Vacant Quarter abandonment that potentially reflect climatic, ecological, or social instability that may have preceded the event. This research may also clarify the speed (gradual or fast) and nature of the abandonment (constant or oscillating), as well as potential patterns of political factionalism or coalescence prior to the abandonment. Preliminary analysis shows site specific recipes that likely utilize local clays, although similar shell preparation strategies seem to have been used across all sites.

**Sosa Aguilar, Danny**

**[46]**

*People, Piedras, and Pictographs: Collaborative Archaeology in Abiquiú, New Mexico*

A partnership with the Merced del Pueblo de Abiquiú in New Mexico includes a co-created archaeology research project that incorporates Abiquiuseños in research design, as well as a community leadership-vetted proposal and memorandum of agreement. This project strives to create ethical and accountable archaeology that is rooted in how archaeology can positively impact the contemporary community. This research addresses community-based questions archaeologically and stems from a larger ongoing project called the Berkeley-Abiquiú Collaborative Archaeology Project (BACA) that supports the Merced del Pueblo de Abiquiú in reasserting federal recognition and water rights and reclaiming lost ancestral lands. This aspect of the project operates in conversation with these issues by investigating archaeological features and material culture found throughout Abiquiú, specifically on and around the Abiquiú Mesa. This project engages in methodology centered on collaborative archaeology to tell a narrative of a precontact Abiquiú history as it has been co-created over time by Abiquiú landscape narratives and material culture. This knowledge can then be deployed by the community to identify material culture and areas of interest within the neighboring Santa Fe and Carson National Forests as part of Abiquiú ancestral Pueblo history.

**Sparks-Stokes, Dominique (University of Cincinnati)**

**[2]**

*The Impact of Ceramic Raw Materials on the Development of Hopewell and Preclassic Maya Pottery*

**[WITHDRAWN]**

Spencer, Charles [74] see Covey, R. Alan

Spicola, Erin [64] see Kassabaum, Megan

Spitzer, Megan [91] see Wellman, Hannah

Sprain, Courtney [17] see Pavlovics, Victoria

**Spring, Rebecca and Jessica Smeeks (Binghamton University)**

**[16]**

*Walls and Pathways: GIS Analyses of Defensibility and Spatial Organization, Huamanga Province, Peru*

This project uses Geographic Information Systems (GIS) to analyze Late Intermediate period (LIP) spatial organization and defensibility practices in the Huamanga Province, Peru. The Peruvian LIP (AD 1000–1450) is the period between the collapse of the Tiwanaku and Wari States and the rise of the Inca Empire. This is an ideal time period to study the inter-relationship between warfare and sociopolitical organization, as it has often been characterized as a time of violent conflict and social strife. We explore archaeological survey data from the 2018–2019 PIA-PAPITA field seasons to assess defensibility traits including site elevation, slope, viewsheds, and restriction of access. In addition, spatial organization of structural elements, in particular walls, are evaluated for least cost pathways and physical limitations of movement within the site, while artifacts are looked at to determine density clustering and potential intra-site relationships.

Spring, Rebecca [118] see Smeeks, Jessica



**Springer, Corinne (Natural History Museum of Utah) and Shannon Boomgarden (University of Utah)****[41]**

*Experimental Archaeology Applied to Archaeological Investigations in Range Creek Canyon: Emery and Carbon Counties, Utah*  
 Archaeological investigations in Range Creek Canyon, in east-central Utah, have led to the identification of 500 prehistoric sites. The majority of sites that can be affiliated are linked to the Fremont Culture, semi-sedentary horticulturalists occupying the region 300–1175 CE. Sites range from long-term habitation sites, artifact scatters, rock art, and granaries. Examples of each category can be found from the valley floor to the towering cliff. Some site types are found clustered together, particularly multi-structural habitation sites and artifact scatters. The Range Creek Field Station, operated by the Natural History Museum of Utah at the University of Utah, has been focused on experimental archaeology in an attempt to understand the costs and benefits associated with subsistence strategies employed by the Fremont. These experiments include growing plots of heritage maize, monitoring water levels in the creek, and harvesting wild resources. The long-term goal of these projects is to increase our understanding of the distribution and availability of resources used by the ancient inhabitants of the canyon to better understand factors relevant to the observed patterning of these sites.

Springer, Corinne [41] see Boomgarden, Shannon

Springer, James [88] see Weiss, Elizabeth

Stahlschmidt, Mareike [151] see Steele, Teresa

**Stainton, Adrienne (Texas State University), Ashley McKeown (Texas State University) and Nicholas Herrmann (Texas State University)****[32]**

*Analysis of Cultural Retention in an Eighteenth-Century Enslaved African Community in the Dutch Caribbean*

The island of Sint Eustatius, once the world's wealthiest free-trade port, played an important role during exploitation and globalization of the New World. This research project addresses the retention and/or loss of traditional cultural practices of enslaved Africans in the wake of European presence and influence at burial ground SE600. If traditional cultural practices were retained, then SE600 should provide evidence of retention through mortuary practices within the African cemetery. Artifacts from SE600 recovered during the 2012–2019 excavations were used for qualitative analysis. Spatial analysis of funerary attributes was analyzed using photogrammetry and documentation from the 2012 and 2017–2019 excavations. Comparative samples used to assess cultural retention are from West African and/or African American burial grounds, chosen based on the similarity of date ranges. The relevant frequency of variables at SE600 as well as the Fisher Exact test of independence between variables at each site suggest both loss and retention of African cultural mortuary practices compared to other enslaved and/or freed African burial grounds. In an effort to assess the movement of traditional practices of enslaved Africans brought to the New World through globalization, the project's goal was to assess retention and loss of African mortuary practices observed at SE600.

Stanchly, Norbert [152] see Micheletti, George

Stanchly, Norbert [72] see Praet, Estelle

Stanton, Travis [154] see González López, Angel

**Stark, Barbara (Arizona State University)****[122]***Discussant***Stark, Miriam (University of Hawai'i, Manoa)****[79]***Discussant*

Stark, Miriam [150] see Bhattacharyya, Tiyas

Stark, Miriam [150] see Heng, Piphai

Starkovich, Britt [72] see Wong, Gillian

**Stauffer, John (Washington University in St. Louis)****[51]***Chair***Stauffer, John (Washington University in St. Louis)****[120]**

*The Disintegration of Style and Memory: Mound 3 Assemblages at Lake Jackson*

At the 75th annual meeting of the Society of American Archaeology, Claudine Payne proposed that Lake Jackson's Mound 3 served as a repository for ritual heirlooms that could no longer be used in the manners their creators intended. This paper revives her hypothesis to examine the role of this archaeological context at the geographic and temporal periphery of the Braden Style horizon. As this symposium's participants agree that artworks in this style transform objects used for ritual into political resources, I entertain the notion that a loss of essential ancestral knowledge for their use is accompanied by risks associated with their misuse. Consequently, Mound 3's construction could be interpreted as a preventative measure that secured these potent heirlooms with the deceased individuals whose voices could no longer be heard by the living. From the author's perspective, Lake Jackson thus provides an important bookend in discussions about the communicative qualities of Native North American iconography.

Stauffer, John [51] see Mersmann, Joy

**Steele, Teresa (UC Davis), Alex Mackay (University of Wollongong) and Mareike Stahlschmidt (Max Planck Institute for Evolutionary Anthropology)**

[151]

*Life in the Margins: The Pre-Still Bay Deposits from Varsche Rivier 003, Southern Namaqualand, South Africa*

Varsche Rivier (VR) 003 is located in the Knersvlakte, the quartz-gravel plains of southern Namaqualand, South Africa. While currently a marginal, low-rainfall region within the Succulent Karoo Biome, conditions were more favorable during the Late Pleistocene. VR003's pre-Still Bay deposits provide an opportunity to examine earlier adaptations within the Middle Stone Age. Luminescence dating of feldspar and  $^{230}\text{Th}/\text{U}$  dating of ostrich eggshell (OES) indicate accumulation 95–75 ka. Faunal remains indicate that the landscape was wetter and grassier than present. Secondary gypsum formations throughout the sequence indicate a switch from these wetter conditions to dry conditions later in time. The lithics include common notched and denticulated flakes and silcrete dominants. ~90% of silcrete cores show signs of thermal alteration prior to flaking, with evidence of further reduction of heat-fractured pieces, indicating the presence of low-investment heat treatment. The fauna and OES are extensively burned; we did not observe hearths, but micromorphology samples preserve microscopic fragments of charcoal and heated bones. Marine shell indicates site catchment area, because VR003 is currently 43 km inland. Some OES appears to be flaked and could represent flask apertures. The recovered marine shells, flasks, and pigments have patterned distributions that reveal changes through time.

Steele, Teresa [33] see Lagle, Susan

Steffen, Anastasia [35] see Bergman, Stephanie

**Steinbrenner, Larry (Red Deer College)**

[132]

*The Mixteca-Puebla International Style as a Mesoamerican Marker in Postclassic Greater Nicoya: A Reevaluation*

The beautiful polychrome ceramics of Pacific Nicaragua's Sapoá period (800–1300 CE) have long been touted as the southernmost manifestation of the Mixteca-Puebla phenomenon in lower Central America. Traditionally, these ceramics have been treated as de facto cultural markers of two independent migrant groups of Mesoamerican origin: the Chorotega, Otomangueans who arrived first and who are usually associated with the earlier-appearing Papagayo Polychrome (a ceramic type with apparent linkages to the southeastern Maya Periphery) and the Nicarao, later-arriving Nahuas who are commonly linked to the later-appearing Vallejo Polychrome, the ceramic type that demonstrates the most striking stylistic similarities to central Mexican "codex-style" art. This paper will reevaluate these traditional assumptions in light of evidence that both ceramic types were produced by potters working in a common potting tradition of likely Central American origin rather than in two distinct traditions of Mesoamerican origin.

**Steinman, Charles (Columbia University), Michele Hayeur Smith (Brown University) and Soumen Mallick (Brown University)**

[148]

*The North Atlantic Wool Trade, ca. 1000–1400: A Strontium Isotope Approach*

North Atlantic islands were colonized by settlers from Norway and the British Isles in the ninth century, bringing agricultural practices from Northern Europe. Wool and fish dominated exports from Iceland from the Viking Age, although the impact of the wool trade remains understudied. We examine textile collections from museums to explore the intensity and extent of this trade by strontium isotope analysis. The data we find provide us with information about how wool moved across the North Atlantic during this period. In turn, this helps us understand when and how wool began to connect very distant communities. We draw on our specific case study to offer suggestions on how to better use strontium isotope data for archaeological purposes and how to improve our methods of data collection and analysis. We furthermore view our archaeological and geochemical data in tandem with historical sources that deal with medieval North Atlantic woolen cloth. Our paper focuses especially on the challenges of reconciling archaeological, geochemical, and historical methods, approaches, and data.

**Stemp, W. James (Keene State College), Jaime Awe (Northern Arizona University) and Christophe Helmke (University of Copenhagen)**

[158]

*The Implements of the Blade House: The Function and Symbolic Significance of Laurel-Leaf Bifaces from Caves in Central Belize*

Large, finely made laurel-leaf chert bifaces have been recovered from the ancient Maya cave sites of Actun Chapat, Actun Tunichil Muclnal, Actun Yaxteel Ahau, and Je'reftheel, which are located in central Belize. By considering these laurel-leaf bifaces from the perspectives of lithic raw material, production techniques, symbolism, and use-wear, we seek to develop a better understanding of these artifacts as ritually significant objects recovered from subterranean locales. Analysis results indicate that most of these bifaces

were made at Colha and traded in finished form throughout the eastern Maya Lowlands. Laurel-leaf bifaces share similar manufacturing techniques with large silhouette eccentrics and, like these, were symbols associated with the power of divine kings, lightning, and sacrifice. Such symbolic meanings also likely connect them to the deities Chaak and K'awiil, both of which demonstrate strong associations with caves. Use-wear analyses provide evidence that some of these bifaces were used for cutting meat and bone, supporting their use as knives in sacrifice. Combining our analyses with ethnohistoric and ethnographic data further assists in understanding laurel-leaf bifaces as both functional implements for and powerful symbols of sacrifice within the context of ancient Maya ideology and worldview.

**Stempfle, Sabrina (Hamburg University), Jörg Linstädter (German Archaeological Institute), Décio Muianga (Universidade Eduardo Mondlane), Martina Seifert (Hamburg University) and Nikola Babucic (Hamburg University)**  
[124]

*Bantu Arrival in Southern Mozambique: Ceramic Analysis as a Source of Information for Dating, Diversity, Technology Transfer, and Nutrition*

In 2016, a research cooperation between the Eduardo Mondlane University and the German Archaeological Institute was started. Since then, this cooperation performed various surveys and geomagnetic prospection and developed with Hamburg University a dedicated research project which this contribution introduces. The introduction of pottery to southern Africa is associated with the immigration of early farmers, the Bantu speakers, about 2,000 years ago. Recent research challenges this model since distinct pottery was found in archaeological contexts of hunter-gatherer or hunter-herder communities. Furthermore, the Bantu pottery in Mozambique, called Matola pottery, has been dated a few hundred years earlier, challenging the previous attribution to Early Farming Communities. The current research project aims to study the Matola pottery using archaeometric approaches to test the Bantu model and to investigate the beginning of pottery production in southern Africa regarding dating, the process, and the diversity in raw material, techniques, and use. The absolute ages will be reevaluated by radiocarbon dating, thermoluminescence dating, and compound specific lipid dating. The diversity in raw material, technique, and use within the classified pottery unit will be determined using polarized light microscopy, lipid analysis, X-ray fluorescence analysis, and infrared spectroscopy.

Stempfle, Sabrina [124] see Babucic, Nikola

Stempfle, Sabrina [124] see Linstädter, Jörg

**Stephen, Jesse (Defense POW/MIA Accounting Agency) and Joshua Toney (Partnerships and Innovations)**  
[38]

*Applying the Power of Partnerships to the Search for America's Missing in Action*

The Defense POW/MIA Accounting Agency's mission is to provide the fullest possible accounting for our missing personnel from past conflicts to their families and the nation. We search for missing personnel from World War II, the Korean War, the Vietnam War, the Cold War, the Gulf Wars, and other recent conflicts. Our research and operational missions include coordination with countries and municipalities around the world, and also involves a growing number of partner organizations who work closely with the agency. DPAA has initiated and developed its partnerships program over just the past few years. This symposium offers a closer look at its results by opening a window into the efforts, and perspectives, of a select group of partners themselves. From university departments to cultural resource management firms, from the simple coordination of information to the complexity of launching massive field projects, from the involvement of accomplished scholars to passionate amateurs—the power of partnerships already excites. With more than 82,000 Americans still missing, however, we aim here to not only discuss the successes of the program but to also foster dialogue regarding how partnerships can be a sustainable and effective tool in the context of the accounting effort.

[38]

*Chair*

**Stephens Reed, Lori (Aztec Ruins National Monument/Chaco Culture National Historical Park), Aron Adams (Aztec Ruins National Monument/Chaco Culture National Historical Park) and Jeffery Wharton (Aztec Ruins National Monument)**  
[100]

*A Closer Look at the Big Picture: Great House Community Dynamics at Aztec Ruins National Monument, Northwest New Mexico*

Three Chacoan great houses (Aztec North, West, and East) comprise the focal point of the Ancestral Pueblo community at Aztec Ruins National Monument in the Animas Valley of northwestern New Mexico. The well-known occupational histories of Aztec West and East, established through decades of tree-ring dating, includes over 4,000 tree-ring dates taken from structural timbers. Aztec North and the associated community of habitation sites contained within the monument are less well known, but integral to the establishment of the great house settlement. With completion of an archaeological inventory for all property within the monument boundary, the story of the Aztec great houses and the people who built these grand structures has expanded. Utilizing several analytical tools, such as ceramic mean dating, tree-ring dating, architectural attributes, and GIS resulting from the inventory and past excavation projects, we propose a settlement history for the Aztec great houses and community. Our goal in this presentation is to offer a cohesive story of a great house community with its local founding during the late AD 1000s, Chacoan heyday in the early AD 1100s, revitalization movement in the post-Chaco era, and final migration and depopulation by AD 1290.

[100]

*Chair*

**Sterling, Kathleen (Binghamton University)**

[81]

*Beyond Leaky Pipelines and Glass Ceilings: Equity Issues on the Academic Track*

Achieving equity in academia is framed as a process of shattering glass ceilings, letting everyone climb as high as their abilities allow. The leaky pipeline metaphor relies on a future with enough diversity-in-waiting that some of it will flow to higher ranks. These

metaphors give the impression that no one is acting badly, the system works as it should, and we just have to wait. Archaeology has an image that may make this situation worse than academia in general—our colonialist history and masculinist image reflects the face of power in the discipline. Looking at the people in power and not seeing oneself reflected is not enough to discourage students and early-career scholars. However, witnessing patterns of harassment and bullying, tenure denials, extra service that is less valued, lower pay, and other indignities, and being on the receiving end of microaggressions does a great deal of damage. What are some of the current gaps in academic archaeology, so we might determine where the most urgent work is needed? What concrete actions might we consider that will ensure equity in archaeology?

**Stewart, Brian (University of Michigan), Kyra Pazan (Museum of Anthropological Archaeology, University) and Genevieve Dewar (University of Toronto)**

**[151]**

*That High Lonesome Sound: The MIS 5a (~80 ka) Middle Stone Age Lithic Assemblages from Melikane Rockshelter, Highland Lesotho*

**[WITHDRAWN]**

Stewart, Brian [24] see Feak, Angela

Stinchcomb, Gary [24] see Kelsey, Brady

Stinson, Susan [81] see Herr, Sarah

Stock, Janet [143] see Perez, Gary

Stock, Jay [40] see Hanson, Annalys

**Stöckli, Matthias (Universidad del Valle de Guatemala)**

**[84]**

*Some More Thoughts on the Study of Prehispanic Soundmakers*

The study of prehispanic musical instruments or soundmakers stored in museum collections was certainly foundational to the history of music archaeology. Due to the fact that they were most often decontextualized, those studies used to concentrate on one of two aspects of many of these artifacts; namely, their iconography or their acoustics, more rarely also on both. The holistic interpretation of this double nature continues to be a major concern of organological studies within music archaeology. That such an interpretation of their representational and sonic aspects would call for a thorough spatial, social, and cultural contextualization of these artifacts is a claim easy to make but often difficult to implement on the basis of the archaeological evidence. Another topic of this paper is the tendency in recent music archaeology to prefer the supposedly more neutral term “soundmakers” over “musical instruments” when talking about those artifacts. The underlying concepts of these two terms are also worth to be discussed in some length.

**Stokes, Robert (Eastern New Mexico University) and Joseph McConnell (Eastern New Mexico University)**

**[143]**

*A Mimbres Mogollon Sacred Landscape as Seen from an Early Classic Period Communal Structure at City of Rocks State Park, Southwestern New Mexico*

In this paper, we discuss elements of what we argue were components of a sacred landscape imbued with meaning as seen from a Mimbres Mogollon communal structure at City of Rocks State Park in southwestern New Mexico. The structure dates to the early Classic period and falls into the poorly understood period of time marking the evolution of Mimbres communal spaces from the burning of Late Pithouse period great kivas (AD 950) to the use of oversized surface rooms and plazas at pueblos after AD 1050. We explore why this rare isolated communal structure is where it is and what its role may have been with regard to the adoption of elements of Mesoamerican mythology during the early Classic period. The dramatic near and far landscape elements that encircle the site create a unique viewshed that we argue have clear connections to elements of Mesoamerican mythology and iconography, such as Mimbres-style depictions of the feathered/horned serpent and naturally occurring fertility/ regeneration imagery. We suggest that this early adoption and syncretization of elements of Mesoamerican mythology set the stage for the subsequent Mimbres use of the Hero Twins mythology previously discussed by others (e.g., Patricia Gilman and Marc Thompson).

**Stoll, Marijke (Indiana University) and Hilary Leatham (University of Chicago)**

**[135]**

*Changing Paradigms in Oaxaca Archaeology: Examining the Past to Understand Our Future*

Over the past century, archaeology in Oaxaca had gained a reputation among American researchers as a space rife with contentious debates. On the other side of the border, Mexican researchers remained disconnected from these scholarly debates, in part because little effort was made to build a dialogue between the American and Mexican academics. To address this divide, junior scholars have organized the Diálogos en Oaxaca Archaeology project, bringing together American and Mexican-based researchers working in different regions of Oaxaca and on various research themes and time periods. This presentation traces the history of archaeology in Oaxaca, starting first with Ignacio Bernal and Alfonso Caso's work at Monte Albán and Kent Flannery's Human Ecology Project, before connecting it to the next wave of researchers in the 1990s and onward. This historiography of Oaxacan

archaeology casts a critical eye on paradigmatic shifts and highlights what is at stake in contemporary debates, especially with regard to heritage and stewardship of the past. By reassessing the past and cultivating “bridges” between scholars, we challenge the asymmetrical knowledge production that has plagued Oaxacan archaeology over the last century in order to build more equitable futures.

[135]

Chair

**Stone, Jessica (University of Oregon), Caroline Kisielinski (University of Kansas), Justin Tackney (University of Kansas), Scott Fitzpatrick (University of Oregon) and Dennis O'Rourke (University of Kansas)**

[83]

*Tracking Human Dispersals to Palau Using Ancient DNA: Results from the Chelechol ra Orrak Site*

Initial settlement of Remote Oceania represents the world's last major wave of human dispersal. While transdisciplinary models involving linguistic, archaeological, and biological data have been utilized in the Pacific to develop basic chronologies and trajectories of initial settlement, a number of elusive gaps remain in our understanding of the region's colonization history. This is especially true in Micronesia, where a paucity of human skeletal material dating to the earliest periods of settlement has hindered biological contributions to dispersal models. The Chelechol ra Orrak site in Palau contains the oldest known human remains in Micronesia (3000–1800 cal BP), and therefore provides an excellent opportunity for direct study of initial population dispersals into the region via ancient DNA (aDNA). Here, we present results from research involving the recovery of aDNA along with new radiocarbon dates from individuals interred at the site. A combination of targeted sequencing of the mitochondrial control region and hybridization capture of full mitochondrial genomes has yielded evidence of haplotypes consistent with Island Southeast Asian origins and population affinities. Together, current results demonstrate genetic distinctiveness between other ancient Pacific Island and modern Palauan data but still support archaeological and linguistic models suggestive of an Island Southeast Asian origin.

Stone, Jessica [130] see Hanna, Jonathan

**Stone, Pamela (Hampshire College)**

[127]

*Skeletal Transcripts as Ancestral Voices, a Legacy of Interdisciplinary Work: Recognizing the Contributions of Dr. Debra L. Martin to American Archaeology and Beyond*

Using the skeleton as a transcript of past experiences is not new, and over the last 40 years more nuanced interpretations, through intersectional, humanistic, scientific models have been developed. In the field of bioarchaeology this work has been impacted by the many exceptional contributions of Dr. Debra Martin. She has guided our profession, investing her own rigorous methodologies and theoretical analysis to promote engaged, multidisciplinary research, and best practices while upholding ethical standards. My own work, which considers larger systemic issues that impact and influence how bodies on the margins are understood, continues to be influenced by her support, mentorship, and friendship. As I examine how anthropology has constructed the “normal” and the “deviant” body, over the last 30 years, from the Native American Graves Protection and Repatriation Act, to rethinking the reproductive body, through embodiment and structural violence theory, and in my current work on critical white feminism, my intertwining of skeletal analyses within these larger discourses is emblematic of the way I was mentored to do anthropology; not just from a reductionist lens, but through an intersectional prism. I am honored to share how my research has been, and continues to be, impacted by Deb's mentorship and support.

[127]

Chair

Stone, Pamela [127] see Ralston, Clair

**Stone, Samantha (Oregon State University) and Samuel Burns (Oregon State University)**

[144]

*Voices in Conversation: Assessing 36 Years of Demographics in a Professional Archaeology Newsletter*

Academic research is comparable to a conversation. As in all conversations, certain voices are amplified while others are underrepresented. Much of this academic conversation happens in peer-reviewed journals and academic books, but informal conversations outside of these arenas are often overlooked. We are studying the conversation of a specialized academic community—archaeologists working on the Late Pleistocene of the Americas—to elucidate its demographic structure. Our dataset is the *Mammoth Trumpet*, the newsletter of the Center for the Study of the First Americans. This newsletter, published quarterly from 1984 to the present, is aimed at a professional and avocational audience and provides regular diachronic snapshots of the state of the field over a 36-year period. This phase of the project consists of collecting data on each individual mentioned in the newsletter, documenting the frequency of mentions, the context, and basic demographic data. This data will be used to examine the structure of this unique academic conversation and how its demographics have changed over time. We hope to provide insight into the practice of archaeology over the last 36 years and to demonstrate the value of professional academic newsletters for documenting the demographics of academic conversations.

Stratford, Dominic [151] see Val, Aurore

**Stricklin, Dominica**

[72]

*Terminal Classic Practices Reflected in Diet and Geolocation: The B-4 Peri-abandonment Deposit at Xunantunich, Belize*

This study applies isotopic analyses of carbon ( $\delta^{13}\text{C}_{\text{coll}}$ ) and nitrogen ( $\delta^{15}\text{N}_{\text{coll}}$ ) from bone collagen, with carbon ( $\delta^{13}\text{C}_{\text{ap}}$ ), oxygen ( $\delta^{18}\text{O}$ ), and strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) to faunal remains excavated from a peri-abandonment deposit at the ancient Maya site of Xunantunich during the Terminal Classic period. Peri-abandonment deposits represent a distinct phenomenon in the Late to Terminal Classic Maya society, a time of social and environmental changes. Peri-abandonment deposits reflect a wide variety of materials: utilitarian ceramics to broken tools, animal remains, items associated with burial practices or other ritual activities, and occasionally human remains. These deposits may represent human acts of resistance to change in their social and ecological environment, reorganization of previous practices, both, or neither. While numerous studies have tried to explain the practices that created these deposits, fewer studies have used multi-isotopic methods in studying animal remains present in these deposits. The dietary results from animal remains in this study indicate no controlled feeding of animals in the B4 deposit, with the exception of one canine which likely consumed a diet similar to its human owners. Geolocation information from these animals reflects a pattern of local sourcing, suggesting expedient acquisition from around the Belize River.

Striegel, Mary [46] see Eldredge, Kaitlyn

Stroebe, Kelsi [40] see Fahey, Brian

**Stroth, Luke (University of California, San Diego), Mario Borrero (University of California, San Diego) and Geoffrey Braswell (University of California, San Diego)**  
[23]

*Plant Use in Elite Domestic Context at Nim li Punit (AD 150–830), Belize*

We describe the paleobotanical collection from Nim li Punit (AD 150–830), a small-scale center in the Toledo District, Belize. The samples were collected from Structure 50, a range building that we interpret to be a Late Classic (AD 700–830) elite domestic context. This was a time of growth and change for Nim li Punit, where new construction coincided with novel political connections and favorable environmental conditions. The macrobotanical collection provides a snapshot of elite diet and lifeways during the dynamic Late Classic period.

Stroth, Luke [89] see Borrero, Mario

Stuart, David [76] see Barrientos, Tomas

Sturdevant, Clark [81] see Colaninno, Carol

**Sturtz, Sara (ASM Affiliates) and Geoffrey Smith (University of Nevada, Reno)**  
[95]

*Renewed Investigations at Leonard Rockshelter*

Leonard Rockshelter is located in Pershing County, Nevada. Initially mined for bat guano, workers discovered artifacts in 1938, prompting a visit by Robert Heizer. Heizer returned to excavate the site in 1950 and reported more than 2 m of stratified deposits from which he recovered a modest assemblage of perishable and lithic artifacts. Of interest to the University of Nevada Reno's Great Basin Paleoindian Research Unit (GBPRU) was Heizer's find of obsidian flakes in association with guano that returned a radiocarbon date of 11,200  $^{14}\text{C}$  BP. This Clovis-era date prompted the GBPRU to return to the site in 2018 and 2019 to evaluate Heizer's claim of a potential Clovis-era occupation and gain a better understanding of the site's stratigraphy. We discuss our 2018 and 2019 excavations with a focus on understanding the age of the deposits and Leonard Rockshelter's importance in the western Great Basin.

Suafo'a Taua'i, Epifania [47] see Klenck, Joel

**Suaza Español, María Angélica**  
[186]

*The Hacienda and the Formation of Cultural Traditions in Nueva Granada*

The hacienda in Nueva Granada was a space of domination by the Europeans in their colonial expansion in America. In it, a multiplicity of intercultural relationships were woven between indigenous people, enslaved Africans and Spanish. This melting pot of individuals with different cultures and originating from various societies found themselves on the farm creating relationships of domination-subordination around the land. Thus, Indigenous people and Africans who were brought as slaves to these lands had to create adaptation strategies to survive in the face of the new reality imposed by Europeans on the American continent. The hacienda space was the setting where new habits were created, adapted, and innovated, which over time cemented deep-rooted cultural traditions, arising from Spanish colonialism.

Sugiura, Yoko [71] see Nieto Hernandez, Rubén

Sugiyama, Nawa [94] see Hsu, Teresa

Sugiyama, Nawa [30] see Singleton, Robin  
 Sugiyama, Nawa [155] see Takatsuchi, Ryohei  
 Sugiyama, Nawa [100] see Taxis Muñoz, Ariel

Sugiyama, Saburo [155] see Takatsuchi, Ryohei  
 Sugiyama, Saburo [100] see Taxis Muñoz, Ariel

**Sullivan, Alan (University of Cincinnati)**

[165]

*Discussant*

**Sullivan, Kelsey (University of California, Riverside), Kenichiro Tsukamoto (University of California, Riverside) and Jaime Awe (Northern Arizona University)**

[140]

*Craft Specialization in the Hinterland: Lithic Tool Production within Dispersed Urban Landscapes at El Palmar (Campeche, Mexico) and across the Maya Lowlands*

Dispersed urban landscapes are mosaics of individual interactions generated through a range of social and economic processes. Large-scale lithic production provides a lens for understanding the interconnected nature of economies between hinterland communities and central polities, yet it remains relatively underexplored in Classic period Maya society (AD 250–850). Growing evidence, however, suggests that patterns exist in the ancient Maya lithic production. Understanding these patterns sheds light on the economic implications of craft productions in urbanization processes. This paper explores a hinterland community, Took' Witz, located in the hinterland of El Palmar, a large Classic Maya polity in southeastern Campeche, Mexico. The site has evidence of several large-scale chert biface production areas, in the form of numerous debitage deposits. We will discuss the results of recent excavations of a lithic deposit at the site and the subsequent debitage analysis, as well as the relationship between independent producers and polity-wide economic systems. These data will be juxtaposed to other known lithic production communities in the Maya lowlands, with a particular focus on central Belize, to advance the understanding of ancient Maya urbanism and economy.

**Sundstrom, Linea (Day Star Research)**

[126]

*Lame Bull Speaks: The Lukin Ledger and Pikuni Blackfoot History*

A Pikuni Blackfoot notebook created sometime between 1904 and 1911 and linked to the descendants of Lame Bull contains a winter count, a record of two treaty conferences, and a list of the leaders of various nations comprising the Blackfoot Confederacy, recorded as pictographs. An unknown person has annotated some of the pictographs in English. The record provides a Blackfoot perspective on contact-era history. In addition, the specifics of the pictographic system provide a key to interpreting some northern Great Plains rock art.

Sundstrom, Linea [53] see Bies, Michael

Supernant, Kisha [81] see Hodgetts, Lisa

Surovell, Todd [192] see Herron, Molly  
 Surovell, Todd [28] see Ricketts, Macy

**Sutter, Richard (Purdue University, Fort Wayne), Gabriel Prieto (University of Florida, Gainesville), Jordi Rivera (University of Florida, Gainesville) and Celeste Gagnon (Wagner College)**

[159]

*The Biological Relatedness between the Salinar (400 BC–AD 100) and Other Prehistoric Populations of the North Coast of Peru: A First Approximation Using Nonmetric Dental Traits*

Following the demise of the Early Horizon (800–200 BC) and Chavín influence in the Central Andes, archaeologists—historically—have hypothesized that cultural changes on the north coast of Peru, such as the “White-on-Red” cultural traditions, as well as the Salinar, were due to an influx of highland peoples. We test this hypothesis through biodistance comparisons of Salinar skeletal populations from the Moche Valley to other populations from the region using genetically influenced tooth trait frequencies. Preliminary results support the hypothesis that there was an influx of people into the region sometime leading up to the terminal Early Horizon Salinar era (400 BC–AD 100), who interbred with preexisting Late Preceramic (2100–1800 BC) and Initial period (1800–800 BC) coastal peoples. The implications of these results are discussed.

Sutton, Mark [133] see Burnell, Taylor

**Suyuc, Edgar**

[48]

*La arquitectura preclásica de El Mirador: Vista desde la Acrópolis La Pava*

Dentro de las investigaciones del Proyecto Cuenca Mirador, se cuentan las realizadas en La Acrópolis Triádica La Pava. En los resultados se evidencian rasgos arquitectónicos relevantes de la ocupación del Preclásico Tardío en El Mirador. Durante esta presentación se expondrán los hallazgos de las excavaciones en esta edificación, que forma parte del Complejo La Danta. Se considerarán estos datos para discutir el posible alcance de una homogenización arquitectónica en este período y su significado tanto a nivel del sitio como regional.

Suyuc, Edgar [48] see Hansen, Richard

**Swenson, Edward (University of Toronto)**

[45]

*Cosmopolitics and Community Reformation in Middle Horizon Jequetepeque*

In his analysis of Shang authority structures, Campbell attacks the search for ancient states in the archaeological record as founded on “an illusory and anachronistic projection of modern political contingencies” (2009:821). Indeed, a narrow focus on rational leadership strategies or the application of rigid trait lists distort the historical realities of Andean political institutions and how they variably articulated with diverse social fields (*sensu* Bourdieu), whether families, lineage confederacies, cults, *wak’as*, or artisans, etc. In this paper, I examine how distinct social networks, especially emerging corporations of craft specialists, contributed to the cosmopolitanism, intensified social interactions, and religious transformations characteristic of the Late Moche period in the Jequetepeque Valley. In the end, I argue that centralized institutions did not simply impose the socio-physical spaces, technologies, and ideologies that commonly define the Middle Horizon. Instead, they were in large part (re)made and sustained by local communities and the material corpora they produced and consumed.

**Swogger, John (Archaeological Illustrator)**

[83]

*A Different Way to View the World: Comics, Outreach, and Cultural Heritage in the Islands of Yap and Palau, Micronesia*

Comics can not only be an engaging and accessible medium for public outreach in archaeology but also help strengthen connections between such outreach and other aspects of cultural heritage. Applied comics utilize specific kinds of visual storytelling devices such as explicitly identified narrators, visual contextualization, and a constructivist approach to information to communicate archaeological data, process, and interpretation. Using the same approaches to communicate other kinds of related stories about the past can place archaeological outreach within a much wider conceptual milieu—embracing ecological, cultural, historical, and biographical storytelling about the past, and more closely partnering with community and Indigenous perspectives. This has significant implications for the broader context of community-based outreach in the Pacific, particularly as regards archaeology’s relationship with issues such as development and the impact of climate change. Such an approach offers the opportunity to build a different kind of public voice and visibility for archaeology, while simultaneously promoting a more networked place for archaeology within community-based heritage working. This paper will draw on recent comics projects in the Pacific dealing with archaeological excavation and research, traditional culture and educational practices, government cultural heritage policy, and ongoing post-World War II reconciliation.

**Symanski, Luis Claudio (Federal University of Minas Gerais)**

[186]

*Color Lines, Material Culture, and the Negotiation of Social Space in the Sugar Plantation Fazenda do Colégio, Campos dos Goytacazes, Brazil*

This work addresses the dynamic of social relations at the sugar plantation Fazenda do Colégio, in northern Rio de Janeiro state, Brazil, through the analysis of the refined and coarse earthenwares recovered from the planters’ house midden and from two slave quarters areas. I argue that these ceramic items exerted a central role in the construction and maintenance of social and cultural borders, not only between these two groups but also in the slave quarters space. These material items were imbued with values, aesthetics, and aspirations that enhanced the structuring social and racial categories operating in the plantation society.

**Szremski, Kasia (University of Illinois)**

[157]

*Success and Power through Networking: Lessons from Chancay Elites in the Huaura Valley*

During the LIP, the north-central coast of Peru was inhabited by small but dynamic polities that were actively engaged in interregional networks of trade, intermarriage, and warfare. However, we know little about how these groups interacted with or were incorporated into the Inca Empire and it has long been assumed that they meekly submitted to Inca advances. This paper seeks to reexamine how some small-scale polities engaged with the Inca through a critical rereading of colonial period documents related to the Chancay, a group that rose to prominence in the Huaura and Chancay valleys between 900 and 1570 CE. Drawing from a combination of archaeological data from the Chancay, Huaura, and Huanangue Valleys together with a reanalysis of data from documents such as the 1549 and 1583 Visitas to the Huaura Valley, the Justicia 396, and the Historia Anonima de Trujillo, this paper will argue that a faction of Chancay elites based in the Huaura Valley actively built relationships with the Inca that they then leveraged to shift power away from the traditional elites based in the Chancay Valley. Through doing so, this paper will show how small-scale groups were often able to “manipulate” the Inca to gain local advantages.

[157]

Chair



**Szumilewicz, Amy (Southern Illinois University, Carbondale)****[182]***The Portable Murals and Painted Shrouds of Middle Sicán Tombs*

The primacy of textiles as the preeminent expressive medium of identity and alterity is well documented in Andean prehistory. Based on the study of three types of textiles including tapestry woven patches and painted cloth housed in the Ethnological Museum of Berlin as they compare to mixed-media mounted canvases found in situ at the site Sicán, this paper spotlights the interrelatedness and significance of textile and painted arts in the Middle Sicán, or Classic Lambayeque, period between 900–1100 CE. With the majority of preserved, diagnostically Sicán specimens deriving from the central coastal site of Pachacamac, these portable objects expose the breadth and ubiquity of Middle Sicán emblems and ideas during the Late Intermediate period. Assessment of function and depositional patterns intimate the variable roles of textiles in funerary contexts. From self-enhancement through small, emblematic and bold patches for personal adornment, to shrouds and seals sanctifying a burial, and finally, monumental, though mobile architectonic dressings, Sicán aesthetic expression is proven to be technologically complex, brilliantly colorful, and more iconographically diverse than is typically characterized through their better known metallurgical and ceramic products.

**[182]***Chair***Szuter, Christine****[79]***Discussant***Szymanski, Ryan (Petrichor Research)****[170]***Historical Ecology of Demographic and Economic Change in the Highlands of Western Kenya: Archaeobotanical and Mycological Evidence*

The last several millennia of cultural history in the western Kenyan highlands have been marked both by punctuated periods of considerable demographic and economic change, and by continuous in-situ processes of genetic, linguistic, and economic interaction and admixture. Historical linguistic and archaeological models of the peopling of this region have, among other contributions, offered a rough timeline for the “arrival” and incorporation of various food production and landscape management practices into the economic repertoire of western highland populations. Archaeobotanical and mycological evidence is presented here which, in concert with a review of existing archaeological and historical-linguistic knowledge, broadly supports previously advanced narratives of the development of this region's economic lifeways over the last ca. 1,500 years. Greater reliance on mixed farming/pastoralism and plant cultivation are argued to have characterized the period ca. 700 BP to the present, replacing earlier strategies emphasizing tuber cultivation, herding of domestic stock, and hunting-gathering and/or exchange with foraging groups. A centuries-long period of landscape change (ca. 500–900 BP), during which fire-based land management practices were increasingly employed, is posited to be a key timeframe for the development of landscape management strategies enabling what became traditional lifeways during the late Iron Age.

Tackney, Justin [1] see Potter, Bethany

Tackney, Justin [83] see Stone, Jessica

Tadlock, Amy [6] see Lewis, Michael

**Taieb, Juliette (ArScAn [Archéologies environnementales] / Université Paris 1 Panthéon-Sorbonne), Claire Alix (Université Paris 1 Panthéon-Sorbonne), Glenn Juday (University of Alaska, Fairbanks), Owen Mason (INSTAAR, University of Colorado) and Christophe Petit (ArScAn [Archéologies environnementales])****[179]***Revisiting and Extending the Kobuk River Tree-Ring Master Chronology: A Unique Record for Paleoclimate and Archaeology in Northwestern Alaska*

The first and only millennial tree-ring chronology (AD 978–1941) in northwest Alaska was developed in the 1940s by archaeologist and dendrochronology pioneer J. L. Giddings. Constructed from living trees and archaeological samples from the Kobuk River valley, Giddings's sequence established the chronology of the “Arctic Woodland Culture.” As Alaskan archaeology shifted to the search for the Earliest Peoples, radiocarbon dating offered broader applicability in wood-lacking sites, supplanting dendrochronology. Since 2010, researchers have returned to excavate coastal Birnirk and Thule houses in northwest Alaska, realizing the greater chronometric precision of tree rings and their paleoclimatic applications, to supplement Giddings's database with architectural wood that refines the chronological and climate framework within AD 750–1200, a pivotal period in the development of Inuit culture. We present the results of conventional dendrochronology (ring-width) of 250 archaeological spruces (*Picea* sp.) from the Kobuk River and northern Alaska. We cross-dated sites using floating chronologies, comparing our sample sequences ( $n = 70$ ) with Giddings's, extending its weakly defined earlier centuries (pre-AD 1400) by increasing sample size five-fold. The augmented sequence offers extended spatiotemporal resolution for climate and archaeological studies in northwestern Alaska, focusing on the Medieval Climate Anomaly and transition to Little Ice Age.

Taieb, Juliette [179] see Alix, Claire

**Takatsuchi, Ryohei (University of California, Riverside), Nawa Sugiyama (University of California), Saburo Sugiyama (Arizona State University; Okayama University), Tanya Catignani (George Mason University) and Yolanda Peláez Castellanos (Universidad de las Américas, Puebla)**

**[155]**

*Spatial Distribution of Ceramics and Lithics at the Plaza of the Columns Complex, Teotihuacan, Mexico*

Teotihuacan (150 BCE–550 CE), located in the northeastern Basin of Mexico, was a large urban center that was built of a heterogeneous ethnic and socioeconomic population. The Plaza of the Columns and the Plaza North of the Sun Pyramid, in Teotihuacan's core ceremonial zone, are posited as palatial-administrative complexes. The occupants of these two complexes left behind a rich history of artifacts and structures, ranging from ornate and elaborate to subdued and utilitarian artifacts. We present a 3D database of ceramic and lithic artifacts, integrated into our 3D architectural map collected during 2015–2019 field seasons. Resulting in a multi-artifact spatial distribution map in GIS we identify the function of the different areas, define the chronology based on materials' forms and styles, and explore activities associated with specific contexts. The variation in spatial distribution and density provide information on possible areas of consumption and production through the use and function. Most importantly, correlations between distributions of multiple artifact types can be plotted to detect patterned human actions across space (horizontally) and time (vertically). We plan to continue adding to and revisiting this dataset each field season to eventually construct comprehensive perspectives of the two complexes.

Tamberino, Anthony [29] see Liss, Brady

Tapia Mendoza, Everardo [133] see Velasco Fuentes, Rocio

Tarleton, Matthew [119] see Powis, Terry

Taube, Karl [154] see González López, Angel

Taylor, Amanda [39] see Rorabaugh, Adam

Taylor, Christopher [11] see McKee, Brian

**Taylor, Corinne, Megan Perry (East Carolina University) and Robert Tykot (University of South Florida)**

**[20]**

*Reconstructing the Childhood Diet of an Eighteenth- to Nineteenth-Century North Carolina Land-owning Family*

Breastfeeding and weaning practices can impact a child's immune system development and nutritional status and cause long-term health effects. Here we explore the potential relationship between the weaning process and childhood frailty in a late eighteenth- and early nineteenth-century land-owning family in coastal North Carolina. The 10 individuals recovered from the Gause family cemetery in 2017 and 2018 include six children under the age of eight. Incremental  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  of dentin collagen of 12 teeth along with 10 bone samples provide a record of dietary and trophic level shifts that occurred during the weaning and post-weaning periods. The timing of weaning in addition to the composition of solid foods used to supplement breastmilk will be compared between subadult and adult individuals to identify whether particular childhood diets or weaning practices link with childhood mortality. These data are supplemented by macroscopic, radiographic, and histological evidence for metabolic deficiencies that may also impact childhood morbidity and mortality. Overall, this evidence will identify the weaning practices and dietary supplementation of "elite" land-owning families in the Lower Cape Fear region and their potential impact on population frailty.

**Taylor, Katie (Boise State University), Cheryl Anderson (Boise State University) and Debra Martin (University of Nevada, Las Vegas)**

**[78]**

*Heritable Nonmetric Traits: A Study of a Bronze Age Tomb at Tell Abraq, UAE*

This research investigates the use of heritable nonmetric traits as a means for assessing population variation and biological relatedness within an archaeological sample using the human skeletal tomb assemblage from the Bronze Age site of Tell Abraq (2100–2000 BC). A total of 410 individuals representing all ages and both sexes were interred in the tomb. An analysis of 16 heritable nonmetric traits was conducted on the adult remains for both cranial and postcranial elements. Of the eight elements analyzed, two elements in particular had results potentially indicating biological homogeneity in this sample. The first was the patella, with a high frequency of segmented patellae at 4.46% (7/157), compared to the lower frequency of vastus notch presence at 32.48% (51/157). The second was C1, which had a high frequency of posterior bridging of the atlas at 25% (21/84) and accessory foramen at 10.71% (9/84). Aside from these findings, the other nonmetric trait results from this study suggest that the individuals interred in this tomb exhibited limited biological variation. This study's findings when combined with previous lines of evidence all support hypotheses that consanguineous unions were possibly a cultural practice during the late Bronze Age at Tell Abraq.

Taylor, Kelley [91] see Schwartz, Christopher

**Taylor, William (University of Colorado, Boulder), Jamsranjav Bayarsaikhan (National Museum of Mongolia) and Isaac Hart (University of Utah)**

[93]

*High-Altitude Hunting and the Emergence of Mobile Pastoralism in Eastern Eurasia*

The emergence of herding economies prompted drastic changes to life in eastern Eurasia—situating the cold, arid steppes of Mongolia as a center of the ancient world. Although a growing body of evidence points to an important role for mountain zones in this transition, issues of archaeological preservation have prevented a clear understanding of the subsistence base for early pastoral societies. High mountain snow and ice patches, which preserve organic biological and cultural material, provide rare snapshots into the exploitation of high-mountain zones. We present the results of archaeological survey of snow and ice patches in the Altai Mountains of western Mongolia, representing a near-continuous record of more than 3,500 years of human activity. Our results demonstrate a crucial role for alpine big-game hunting in eastern Eurasia's early herding societies, with strong evidence for exploitation of the argali sheep (*Ovis ammon*). Analysis of recovered artifacts provides direct insights into Bronze Age projectile technology and hunting strategies and suggests ceremonial treatment of argali remains. Together, these finds indicate that big-game hunting in mountain zones played a significant role in the emergence of mobile pastoralism in eastern Eurasia and formed an important component of subsistence across the later Holocene.

**Taylor Riccio, Kia (Syracuse University)**

[2]

*Blurring Historical Lines: Cultural Divisions in the Lesser Antilles*

This poster presentation complicates the cultural and temporal divisions of pottery types in the Caribbean. Specifically, this work seeks to elucidate the overlapping nature of Kalinago, Taíno, European, and Maroon pottery styles in the Lesser Antilles. Using archaeological material and data from La Soye, Dominica, and reference works from across the Lesser Antilles and the Caribbean, this project displays the entangled nature of Kalinago expansion and European contact. Douglas Armstrong, Corinne Hofman, William Keegan, and Mark Hauser, among several others, continue to make incredible strides dismantling the disjointed binaries in Caribbean Archaeology. Regrettably, these binaries have captured the public mind beyond what the archaeological and historical data supports. Not only do these cognitive divides curb the potential for cultural crossovers, but they also homogenize Caribbean cultures into simplistic, and often diametrically opposed, groups. Caribbean archaeologists are moving away from these monochromatic divisions in favor of interconnected and diversified webs of relation. Such endeavors necessitate a blurring of historical lines, including pre- and postcolumbian, indigenous and European, and Kalinago and Taíno. To buoy these efforts, this presentation expresses the emergence of these mythical binaries, and diagrams entangled and overlapping cultural artifacts in Dominica and the broader Caribbean through visual aid.

Tellez, Joe [143] see Perez, Gary

Tembe, Enio [124] see Muianga, Décio

Tepper, Yotam [191] see Butler, Don

**Terry, Richard (Brigham Young University) and Daniel Bair (University of Puerto Rico, Mayagüez)**

[48]

*Soil Chemical Analysis of the Floors of Walled Enclosures within the Mirador Basin*

Geochemical analyses of soils and floors have proven useful in the interpretation of ancient human activities. Lidar images of the Mirador basin have brought to light Preclassic walled enclosures in the Mirador basin. Soil chemical analysis in combination with lidar and excavation data helped determine the ancient uses for the enclosures. Extractable phosphorus and metallic ions were very low suggesting that the limestone bedrock floors were kept clean. The P and metals were elevated just inside the south and north walls of each enclosure. This is evidence that animals used those areas that might have provided some shade. The most likely animals to have been produced for ritual and food use were domestic dogs.

**Testard, Juliette (Université Paris 1 Panthéon-Sorbonne)**

[139]

*"Serpent Skin" and "Diamond Grid" Motifs on Epiclassic and Postclassic Figurines Skirts*

In Mesoamerica, the wearing of wide belts, skirts, and huipils is characteristic of feminine representations. From the Epiclassic period onward, but more frequently in the Early Postclassic period in Central and Western Mexico, the skirts of certain feminine figurines start to wear what has been called, among many other names, the "serpent skin" motif, sometimes in association with the *xicalcolihqui* (stepped-fret, or *greca* in Spanish). Scholarly consensus proposes that the "serpent skin" motif, composed of diamond patterns, would have originated in Teotihuacan before spreading with Early Postclassic Mixteca-Puebla decorated ceramics, and becoming very common in Aztec period ceramics, figurines, and pictorial codices. Several authors assert that the "serpent skin" motif is associated with femininity, fertility rituals, and power. In the light of several Epiclassic and Early Postclassic figurines examples from Xochitécatl (Tlaxcala), Tula (Hidalgo), and El Palacio (Michoacán), and in resonance with what we know of these motifs in the Late Postclassic period, I will try to discern their possible variants and to propose a set of meanings and what they tell us about these feminine representations, their roles, and status in a diachronic perspective.

**Texis Muñoz, Ariel (Universidad de las Américas, Puebla), Tanya Catignani (George Mason University), Nawa Sugiyama (University of California, Riverside) and Saburo Sugiyama (Arizona State University; Okayama University)**  
[100]

*Mapping Teotihuacan's Inception: Patlachique Phase Ceramics Distribution on the Lidar Map*

The Patlachique Phase (100 BCE–ca. 100 CE) is underrepresented in the archaeological record since most sites were probably covered by the Classic period city of Teotihuacan (200–550 CE). This phase likely represents the beginning of the urbanization process in the Teotihuacan Valley, during a period of exponential growth seen in Central Mexico. We examined the spatial distribution of Patlachique architecture and material culture using lidar data, collected in 2015 by the Project Plaza of the Columns Complex (PPCC), and the surface survey ceramics collected during the 2017–2018 PPCC field seasons. A density analysis of our data indicates the existence of multiple possible civic-ceremonial structures related to the Patlachique Phase, suggesting the lack of a preeminent core and several possible autonomous groups existing during this time. The final spatial distribution map of this phase will allow us to inquire about the nature of these sites, and their role in the dynamics of Central Mexico during the Terminal Formative period (100 BCE–200 CE). This work will expand on previous research conducted by groups led by René Millon and William T. Sanders in the 1960–1970s and will help to identify the maximum extent of this phase in the Teotihuacan Valley.

Thaher, Ahmad [140] see Barket, Theresa

Thelen, Thomas [100] see Aldana, Gerardo

**Thies-Sauder, Meagan (Illinois State University)**  
[134]

*Discussant*

Thomas, Ben [193] see Langlitz, Meredith

**Thomas, David (American Museum of Natural History) and Erick Robinson (Utah State University)**  
[39]

*Impacts of Abrupt Climate Change Events on Human Paleodemography in the Great Basin*

A central question of research on prehistoric human-environment interaction concerns the role of abrupt versus gradual climate and environmental changes on human demography. This research requires high resolution, regional-scale paleoenvironmental records that provide researchers with the ability to discern variable spatial and temporal scales of ecosystem responses to climate change. Another requirement of this research is the development of human paleodemographic proxies that can be arrayed as continuous time series and directly compared to continuous time series generated from proxy paleoenvironmental data. In this presentation we compare radiocarbon proxies of human demography and high resolution paleoenvironmental records from different regions across the Great Basin. Results suggest regionally variable responses of human populations to abrupt and gradual climate and environmental change. This presentation advances knowledge of the specific scales of climate and environmental change driving human demography in the Great Basin.

Thomas, Jayne-Leigh [88] see Beisaw, April

Thomas, Julian [97] see Griffiths, Seren

**Thompson, Amanda (University of Georgia)**  
[110]

*Discussant*

**Thompson, Amy (Field Museum of Natural History), Gary Feinman (Field Museum of Natural History) and Keith Prufer (University of New Mexico)**  
[22]

*Classic Maya Household Inequality in Southern Belize*

Inequality is present in all forms of human societies, but the degree of inequality within a single city or region varies. Recently in archaeological contexts, inequality has been quantitatively evaluated based on house size using the Gini coefficient and Lorenz Curve, thus enabling the comparison of wealth measures and inequality between ancient cities of varying sociopolitical complexity and spatiotemporal regions. We use Gini coefficients and household size (area and volume) to assess inequality in southern Belize at nine Classic Maya (250–800 CE) cities. Inequality varies greatly within southern Belize. Variations in inequality are based on differential access to goods and the intergenerational transmission of wealth as some households are occupied longer than others. Understanding how inequality develops and the variations in inequality between communities are processes applicable to ancient and modern cities alike.

**Thompson, Amy (Field Museum of Natural History)**

[56]

Moderator

**Thompson, Christine (Ball State University), Nancy Knapke (Fort Recovery Museum), Brice Obermeyer (Tribal Historic Preservation Office, Delaware Tribe of Indians), Diane Hunter (Tribal Historic Preservation Office, Miami Tribe of Oklahoma) and Nekole Alligood (Delaware Nation Cultural Preservation)**

[109]

*Engaging Communities through Conflict: A Case Study in the Development of Truly Engaged Scholarship in Two Communities*

Initiation of community engaged scholarship is not an event. It is often a long-term developmental process, requires recursive planning and assessment, and often engages multiple communities. We present a case study of a research project that grew into a community and collaborative archaeological endeavor that balances engagement between two descendant communities of opposing sides of St. Clair's Defeat and the Northwest Indian War. Bridging the cultural gap between these two communities while maintaining commitment to accurate retelling of historical narrative presents many challenges. However, these challenges present direct opportunities to use anthropology in the public sphere to foster empathy and understanding through historical archaeological context. We engage with the popular, but uncritically one-sided, narrative represented in historical public interpretation and even school curricula. We confront this narrative with the full context of the historical and archaeological record. This confrontation facilitates frank, educational discussions about the innate humanity of the other side, leading to reflections about assumptions and a critical assessment of identity and self-history. These reflections enable engagement of both communities with the history and consequences of colonization for American Indians formerly of the Northwest Territory and beyond.

**Thompson, Jessica (Yale University)**

[58]

*Is Analogical Reference Possible for the Earliest Paleoarchaeological Assemblages?*

There is no consensus about how to define the first paleoarchaeological record, or how old it is. An assemblage of flaked stone artifacts from Lomekwi 3, Kenya, dates to 3.3 million years ago. Two fossil specimens at the 3.34-million-year-old site of Dikika-55, Ethiopia, preserve butchery marks on their surfaces. The strength of interpretation that these are anthropogenic sites from the Late Pliocene relies heavily on analogical inference. Where the fossils or artifacts manifest differently from later archaeological sites, stone tool flaking and butchery experiments offer an explanation for why these differences exist. However, these are still experiments conceived and conducted by modern humans in a modern context. The earliest paleoarchaeological record was created by hominins that were not analogous in anatomy, behavior, or life experience. They existed within ecological systems with no modern analogues. Moving more deeply into the paleoarchaeological record, therefore, faithful replication of complex suites of processes becomes less feasible. These theoretical and methodological challenges can be addressed by complementing replication studies with experiments that identify how the physical properties of materials (bone, stone) react to different kinds of forces, some of which may be created by very different agents.

Thompson, Jessica [40] see Hanson, Annalys

Thompson, Jessica [40] see Radican, Kelsey

**Thompson, Josephine (Mirador Conservation Fund), Carlos Morales-Aguilar (Cuenca Mirador), Richard Hansen (Foundation for Anthropological Research and Environmental Studies) and Ross Ensley**

[48]

*Preclassic Settlement Patterns and Natural Topography in the Mirador Karst Basin of Northern Guatemala*

A new model of Preclassic settlement patterns has emerged with the use of lidar to document a large-scale landscape in northern Guatemala. These patterns include highly sophisticated man-made hydrographic features, monolithic transportation networks, extensive residential complexes, and monumental civic complexes and associated natural topography. This new understanding of these inner-connected Preclassic Maya patterns sheds a light on the magnitude of the Preclassic demographic grandeur within the Mirador Karst Basin. The keen understanding of their natural world by the early Maya is demonstrated by their engineering of the natural landscape. With lidar, precise elevation measurements demonstrate how they engineered their structures, according to elevation and topography. In addition, a new understanding of Mirador's Karst Basin and its geography support the claim that the Cradle of Maya Civilization existed within this sophisticated cultural and natural system.

Thompson, Josephine [48] see Ensley, Ross

**Thompson, Lenore**

[99]

*Museums Are Repositories of Knowledge: Using Museum Collections to Recontextualize Culture Contact and Colonial Entanglements in the Pacific Northwest*

Museum assemblages enable and support conservation archaeologies by facilitating comprehensive and multifaceted studies that consider large study areas, time depth, and multiple artifact types. Museums can also work to facilitate ethical research practices by supporting conversation and collaboration between researchers and descendant communities. However, assemblages must be examined critically, acknowledging the colonial beginnings of many current collections. My research focuses on the specific ways that Indigenous populations on the Northwest Coast used copper to create a range of artifacts, and how these traditional practices changed through the fur trade and the colonial period spanning from the eighteenth to the twentieth century. Prior to contact, Indigenous copper resources in the region are thought to have largely been restricted to local sources such as native and drift metals. Examining the ways in which the metal was chosen and worked, and studying the objects created once European material

was introduced into Indigenous repertoires, allows for critical discussions regarding how Indigenous populations navigated this period of upheaval. This research has required access to a plethora of artifacts housed at several museums around the world and was only possible through collaboration with these repositories for archaeological and historic material and knowledge.

**Thompson, Thomas**

**[187]**

*It Brings Me No Joy to Tell You All This, but We Actually Found Gold Once: A Discussion of Visitor Engagement Using Historical and Archaeological Interpretation in Alaska Public Lands*

While they usually do not work in the capacity of Public Information Officers or interpretive staff, cultural resource managers and archaeological technicians are often the ones who are literally “fielding” questions from the public. These questions invariably deal with what “grand discoveries” we have made with finding human skeletal material or golden treasure. Rather than a discrete data assessment, this presentation will introduce anecdotal accounts of the types of questions fielded during visitor contacts at Alaska public lands including Klondike Gold Rush National Park, Denali National Park and Preserve, and the Tongas National Forest districts of Prince of Wales Island. In order to give a better sense of the context of visitation accounts, I will relate these questions within a spectrum of remoteness and accessibility of the public lands where visitation occurred, the type of visitation, and the type of visitor status (e.g., backcountry camper, cruise ship passenger, local tourism worker, hunting guide). My expectation is that this will encourage discussion on interpretation education across a wide spectrum of visitor encounters and improving methods for driving the point home of what the discipline of archaeology actually is and what our jobs actually entail.

Thompson, Thomas [187] see Beach, Sonya

**Thompson, Victor (University of Georgia)**

**[130]**

*Discussant*

Thompson, Victor [68] see Napora, Katharine

Thomson, Marcus [100] see Aldana, Gerardo

Thornton, Erin [80] see Phillips, Lori

**Throgmorton, Kellam (Crow Canyon Archaeological Center)**

**[79]**

*Discussant*

**Thulman, David (George Washington University), Michael Shott (University of Akron), Justin Williams (Roger Williams University) and Alan Slade (Texas Archaeological Research Laboratory)**

**[74]**

*Allometry, Modularity, and Integration: Applying Biological Concepts and Statistical Tests to Stone Tool Shapes*

Most landmark-based geometric morphometric statistical analyses of stone tools are lifted from biological applications. The concepts are not always directly applicable, leading to unfounded interpretations of statistical results. Sometimes the problem is an imprecise definition of terms, but often the problem is an imperfect translation of a biological concept to an archaeological problem. A key to proper translation can be understanding what is actually being tested in the statistics. Here, we work back from the statistical tests for allometry, modularity, and integration in the geomorph statistical R package to better understand how those biological concepts can be profitably applied to archaeology. The results give us deeper insight into how stone tools were designed and used.

**Tiesler, Vera (Universidad Autónoma de Yucatán) and Virginia Miller (University of Illinois, Chicago)**

**[154]**

*Heads, Skulls, and Sacred Scaffolds: New Studies on Ritual Body Processing and Display among the Ancient Maya of Yucatán*

Among late Maya religious complexes, Chichen Itza stands as a monumental landmark. Among the enigmatic aspects of Chichen's ceremonial innovations count skull racks, where the heads of sacrificed victims were exhibited in rows. It was the first Mesoamerican city to erect a permanent, decorated stone platform for the display of impaled heads, anticipating common Late Postclassic practice. Here, we explore skulls with marks of impalement and mandibles with perimortem trauma from both the Sacred Cenote and the Caracol complex, as well as images of skulls and bones. Our combined skeletal and iconographic data confirm increased head processing and exhibition at Chichen when compared to Classic period Maya centers. Nevertheless, these were not foreign introductions, but appear to have been practiced earlier on a minor scale at Terminal Classic Puuc centers. We posit that the exhibition of heads at these sites was a response to the religious and militaristic demands of a new era, culminating in Chichen Itza's dramatic public displays.

**[154]**

*Chair*

Tiesler, Vera [55] see Nakatsuka, Nathan

Tiesler, Vera [154] see Olivier, Guilhem

Tiesler, Vera [154] see Ruiz, Judith

**Tillison, Kevin (University College Dublin)**

**[174]**

*Life and Death of Wooden Vessels: Investigating Wooden Vessel Manufacturing and Woodcraft Within the Rural Settlements of Early Medieval Ireland AD 400–1100*

This PhD research project investigates rural settlements within early medieval Irish woodcraft (AD 400–1100) to ask the questions: what is craft and what makes a craftsman during this period? Over the past few decades numerous wooden items have been recovered from this period in Ireland, thus providing an opportunity to gain insight into the crafts represented and evoke the related themes of skill, specialization and status. Interpretations relating to woodcraft are based on a newly formed database of 1,765 wooden artifacts collated during this project, sourced from past archaeological investigations of rural-secular settlements from across Ireland. These objects were mostly recovered from wet anaerobic conditions that allowed for the preservation of organic materials. Specific focus has been given to wooden vessels (e.g., bowls, buckets, and tubs) of different manufacturing technologies (i.e., carved, stave-built, and turned) as these highlight differences in material selection and skills—even within the same manufacturing technology. This focus allowed for the question to be asked, what is craft, but also to what extent can the material remains recovered provide a clearer perspective on the relationship between the production of wooden objects, the people who made them and the surrounding society of this period.

**Tizzard, Louise (Wessex Archaeology) and Claire Mellett (Wessex Archaeology)**

**[98]**

*Across and beyond Site Boundaries: Maximizing the Legacy of Submerged Landscape Assessments*

The last 20 years have seen a massive increase in offshore development around the UK that has provided archaeologists the opportunity to find and examine new sites from areas of seafloor, in deeper waters and further from the coastline than was previously possible. Through the interpretation of geophysical and geotechnical data within development areas, collaboration between archaeologists, geologists, engineers, and other stakeholders has significantly advanced our understanding of preservation of inundated landscapes over large areas. However, the data and their associated reports, when available, are site specific, and although they have significant value for wider research seeking to understand the potential of “Doggerland,” this value is not necessarily realized on a regional and national scale. Using a case study, this paper will demonstrate how the value of site-specific data can be increased by (1) considering landscapes across and beyond their site boundaries, enabling the formulation of area-specific research questions; (2) using these research questions to inform site-specific aims and objectives rather than simply reacting to data availability; (3) utilizing all available data, including that collected for non-archaeological purposes; and (4) promoting wider engagement beyond the archaeological community.

Tizzard, Louise [98] see Evans, Amanda

**Tokovinine, Alexandre (University of Alabama) and Francisco Estrada-Belli (Tulane University)**

**[76]**

*The Team for the New Age: Naranjo and Holmul under Kaanul's Sway*

The paper presents the results of the last decade of archaeological and epigraphic research that clarify the history of the reigns of Holmul and Naranjo during the expansion of the Dzibanché dynasty in eastern Petén in the second half of the sixth century and the first half of the seventh century CE. The discussion focuses on the textual and material markers of the new geopolitical affiliations of the Sak Chuwen of Naranjo and the Chak Tok Wayaab of Holmul, including changes in polychrome ceramics, hieroglyphic writing, and the rhetoric of good governance and loyalty in public inscriptions. In the case of Holmul, changes in the urban landscape of the city are also observed. The new data clarify the relationship between the royal families of Naranjo and Holmul during the initial period of their subordination to Dzibanché. This perspective on alliances and secondary hierarchies within the domain of the Kaanul kings is extremely important for the understanding of geopolitical processes in the Mayan area during the Late Classic period.

**Tokovinine, Alexandre (University of Alabama)**

**[136]**

*Discussant*

Tokovinine, Alexandre [76] see Viskanta Khokhriakova, Sandra

Tolan, Grace [32] see Fields, Mara

**Tomczyk, Weronika (Stanford University) and Nathan Acebo (Stanford University)**

**[42]**

*In a Shade of Colonial Expansion: The Subsistence Strategies and Consumption Practices in Black Star Canyon, Southern California*

Puhu (Ca-Ora-132), a Native American settlement located in the Santa Ana mountains of California, has been remembered as a unique place of conflict centered on animal utilization. In 1831, Puhu was attacked and defeated by American fur trappers after the accusations of horse-thieving for food. However, analysis of animal remains from Puhu's excavations revealed that European livestock had a minimal, if not a nonexistent, impact on the village's subsistence strategy. The assemblages from the Late Prehistoric (1300–1770 CE) and the colonial period (1770–1850) were dominated by local species, mainly deer (*Odocoileus hemionus*), and lagomorphs (*Lepus californicus*, *Sylvilagus*). Their remains include preserved as well as fragmented and burned

bones, which indicate elaborated food processing practices, and subsequent use of remains as fuel. We suggest that the deer were easily accessible for the Puhu's inhabitants, because of coastal colonization and the introduction of European-style agriculture that caused inland migration of game herds. Furthermore, scarce remains of felines (*Puma concolor*, *Lynx rufus*) and mustelids (*F. Mephitidae*) suggest taking advantage of other indigenous species. Although our findings do not preclude the occurrence of small acts of thievery, the village's subsistence did not depend on it, but rather thrived based on the continuous exploitation of local game.

**Toney, Joshua**

[38]

Chair

Toney, Joshua [38] see Stephen, Jesse

**Toohey, Jason (University of Wyoming) and Patricia Chirinos Ogata (University of California, Santa Barbara)**

[69]

*A Cajamarca Basin Perspective on Northern Highland Interaction during the Middle Horizon and Late Intermediate Periods*

Investigations at the Cajamarca sites of Callacpuma and Yanaorco are shedding new light on shifting patterns and intensities of interregional interaction. Highland influence on the coast has been recognized for many years in the coastal Jequetepeque region and the valleys to its north. The current work presents intriguing new material evidence for the presence of coastal material culture in sites of the Cajamarca Basin indicating at least some level of contact during both the early Middle Horizon and the Late Intermediate period. This material takes the form of both everyday utilitarian objects and more enigmatic ceramic vessels and figurines. All of this indicates previously unexpected levels of material contact with the north coast and hints at social and political interaction between the two regions.

**Torales Ayala, Gabriel (Cinvestav) and Lane Fargher (Cinvestav)**

[71]

*Una aproximación histórico-ecológica a los cambios en el paisaje del área costera de Sisal, Yucatán (1807–1990)*

Esta presentación resume los resultados de una investigación sobre la historia del paisaje de la costa noroccidental de Yucatán. A pesar de la evidencia arqueológica prehispánica, la información sobre las interacciones socioambientales en el área antes de 1950 sigue siendo escasa. Para subsanar este vacío, realizamos una aproximación al proceso de domesticación del ambiente durante los siglos XIX y XX a partir del puerto de Sisal y sus alrededores. Desde una perspectiva de ecología histórica, combinamos fuentes históricas, etnográficas y prospección en campo para identificar los principales cambios ambientales generados por las dinámicas demográficas, las actividades económicas y las prácticas de manejo ambiental del pasado. La evidencia obtenida muestra que dichas actividades modificaron la geomorfología, los flujos hídricos, la composición y distribución de la vegetación, la presencia de especies y la creación de hábitats, con efectos que perduran en el paisaje actual. Estos resultados ofrecen un acercamiento novedoso sobre la historia de las interacciones socioambientales en la costa de Yucatán, el cual complementa los estudios arqueológicos e históricos previos en el área.

**Torquato, Melissa and Erik Otárola-Castillo (Purdue University)**

[12]

*The Effects of Regional Climate Change on the Foraging-Farming Transition in Eastern North America*

For a century, scholars studying prehistoric subsistence have questioned why humans began farming. A common hypothesis is that climate change contributed to the emergence of agriculture. One area where climate change may have influenced early agriculture is the Interior Eastern Woodlands of North America, where the independent domestication of native plants occurred during the Late Archaic period (4500–4000 BP). However, there have been few quantitative analyses examining the effects of climate change on the foraging-farming transition in North America. Our previous research suggests that climate change influenced subsistence behavior during the transition period. The present study expands on prior work by increasing the sample of archaeological sites to provide a more complete representation of the region. This project tests the hypotheses that climate change (1) preceded the foraging-farming transition and (2) led to an increased use of cultivated resources in the prehistoric diet. To test these hypotheses, this study utilizes paleoenvironmental proxies and reconstructions to examine regional climatic trends and archaeological data to evaluate dietary changes during the transition period. This analysis will advance the study of prehistoric subsistence strategies by demonstrating how intra-regional climate change affected the development of agriculture and the use of cultivated resources in North America.

Torquato, Melissa [13] see Hill, Matthew

Torquato, Melissa [74] see Keevil, Trevor

Torquato, Melissa [173] see May, Alejandra

Torres, Ravyn [22] see Laugesen, Jason

**Torres Porras, Alicia, Patricia Plunket and Gabriela Uruñuela**

[30]

*Explorando la transición del Posclásico a la Colonia en Cholula, Puebla: 1519–1540*

La llegada de los hispanos a la ciudad sagrada de Cholula, donde peregrinos y gobernantes se congregaban para rendir homenaje a Quetzalcoatl en su recinto ceremonial, trajo consigo grandes cambios debido a la literal cimentación del catolicismo sobre dicho



recinto. Para tener un acercamiento acotado a patrones de uso y consumo en una época de transición, se comparan materiales relacionados con la destrucción del complejo prehispánico y los procedentes de los depósitos de la ocupación española inicial, posiblemente correspondientes a la construcción del primigenio convento franciscano de San Gabriel. Este estudio examina una pequeña muestra de cerámica y restos óseos, tanto humanos como faunísticos, recuperada en 1993, justo afuera del convento, y sugiere que las principales diferencias producto de la presencia española se aprecian en la dieta y el tratamiento de los restos humanos.

Torres Rodríguez, Gloria [101] see Carballo, David

**Torvinen, Andrea (Arizona State University) and Matt Peeples (Arizona State University)**

[125]

*A Monte Carlo Approach to Estimating Plausible Ceramic Similarity Values from Fabric Characterizations*

Ceramic characterization studies often depend on estimates of similarities and differences in assemblages drawn from relatively small samples to address questions regarding a range of social patterns and processes. In most cases, such characterizations do not consider uncertainty due to sampling error nor do they consider in detail the relationship between characterized samples and whole assemblages. We introduce a method that allows ceramicists to extrapolate plausible values and ranges for ceramic diversity and similarity values between contexts based on limited observed data (i.e., petrographic fabrics or chemical reference groups) using a Monte Carlo simulation. We use this method to evaluate the spatiotemporal consistency of ceramic production among potters at the West Mexican center of La Quemada, Zacatecas. Our study relies on a relatively small petrographic sample of 297 sherds (2.86% of site assemblage) belonging to 19 pottery types, each having been assigned to one of four fabric classes. Using these data with site-wide ceramic frequency data, we generate estimates and error ranges of the plausible similarities between contexts across the site in terms of shared fabrics that crosscut ceramic types. We suggest that this methodology has wide-reaching applications at various spatial scales and using different types of characterization data.

**Toussaint, Mark (University of Nevada Las Vegas)**

[127]

*Queer Eye for the Dead Guy: The Influence of Debra Martin on a Bioarchaeological Investigation of Gender beyond the Binary*

Any aspect of human social life worth studying, whether in the past or present, is a complex product of history, biology, culture, and agency. Gender is a prime and important example of just such a topic. It requires a high degree of nuance to understand and describe gender constructs in a contemporary society, and studies of gender in prehistory are even more fraught. This presentation will focus on what can be learned of gender in Early Bronze Age (EBA; ~2300–1600 BCE) communities of Central Europe through theoretically informed bioarchaeological studies. The unmistakable influence of Dr. Debra Martin will be readily apparent in the biocultural and contextual approach to this research, which draws heavily from embodiment theory and from paleoepidemiological models of the recursive relationships between stressors (environmental and cultural), buffering mechanisms, and health outcomes. This holistic and multiscale orientation toward bioarchaeological research, championed by Dr. Martin, has enabled the current study to find evidence of a complex, plastic, and perhaps nonbinary system of gender in EBA Mierzanowice Culture communities of southern Poland.

Toyne, J. Marla [14] see Haynes, Hannah

Toyne, J. Marla [182] see Nelson, Elizabeth

Toyne, J. Marla [67] see Palacios, Horvey

Trabanino, Felipe [181] see Johnson, Lisa

**Tran, Justin (University of California, Santa Barbara), Jason Woo (University of California, Santa Barbara), Thomas Crimmel (Exploring Solutions Past), Anabel Ford (University of California, Santa Barbara) and Sherman Horn III (Exploring Solutions Past)**

[71]

*Space and Time for the Milpa-Forest Garden Cycle: A Model of the Ancient Maya Landscape of El Pilar*

As a critique of the temperate prejudice of the tropics, we embrace the hypothesis that the Maya forest represents a domesticated landscape to examine the settlement and environmental patterns of the ancient Maya of El Pilar. Recognizing that land use is dependent on knowledge, skill, and labor and the residential requirements of the landscape are not simply for field crops, we consider the whole production cycle for both human subsistence and animal habitat. This includes open fields emphasizing annual crops, succession of perennial building-focused products used in home and maintenance, and closed-canopy forests for products, major construction, and fruits. We define the potentially cultivable landscape by excluding architecture, considering how it would cycle from field to forest and back again. Using slope as a proxy of erosion and depressions as a proxy for lowlands, we assess our 14 km<sup>2</sup> settlement survey around El Pilar by determining areas of infield and outfield cultivation with a land-use cycle of 20 years. We present our results as a model of sustainable land use in the Maya forest.

**Triadan, Daniela (University of Arizona)**

[188]

*Discussant*

**Triplett, Taylor (The College of William and Mary)****[163]***The Hand Site, Revisited: A Collections-Focused Approach to Recentering Deep History in the Lower Middle Atlantic*

This paper reviews the Hand Site (44SN22) Reassessment Project, and broadly explores the reevaluation of existing collections as an avenue for decolonization. The Hand site is a complex, multicomponent site located on the Nottoway River in southeastern Virginia. Intensive excavations in the 1960s revealed over 600 features, including house remains, pits, and a large burial area. While initial evaluations placed the site within the Protohistoric period and emphasized the site's ties to colonial actors, a reexamination of the site's chronology instead suggests a deep history of emplacement extending over 1,000 years. Situated between the Chesapeake and Albemarle worlds, the Hand site provides a vital lens for exploring the histories of Nottoway, Meherrin, and Nansemond peoples who were at the fringe of seventeenth-century colonial accounts. As exemplified by this project, curated collections provide opportunities to refocus long-standing archaeological narratives in ways that acknowledge the depth and complexity of Native histories.

**Tritsch, Michael (Yale University)****[78]***A New Kingdom Domestic Environment at South Karnak: Preliminary Interpretation of Findings at the Mut Precinct and Their Relation to Other New Kingdom Domestic Sites*

In 2005 and from 2018 to 2020, the Johns Hopkins University Expedition at the Mut Precinct in Luxor (ancient Thebes), Egypt, unearthed New Kingdom domestic material, preliminarily dated to the first half of the Eighteenth Dynasty. The findings included a considerable number of articulated, mainly red painted, mud brick features in close proximity to two column bases and a stone feature consisting of pavers and a standing sandstone architectural element with a cavetto cornice and torus roll. Originally interpreted as a small neighborhood chapel, the nature of this domestic environment has been revised based on new findings, more closely relating to "reception rooms" in houses at Amarna and Deir el-Medina. The sandstone feature bears a striking likeness to a "divan," and the painted mud brick is consistent with niches and altars found in such rooms, with the color red appearing almost exclusively on door frames and niches. However, the style of painting at Mut is distinctly unique. These findings provide new insight into domestic life and religion prior to the Amarna period and likely identify a local regional style in domestic architecture, possibly speaking to the representativeness of Deir el-Medina to other New Kingdom habitation sites.

**[78]***Chair***Troccoli, Ruth (DC Historic Preservation Office), Christine Ames (DC Historic Preservation Office) and Delande Justinvil (American University)****[20]***Pandemic2: Archaeology of the 1832 Cholera Epidemic in Washington, DC*

During the COVID-19 lockdown, the DC Archaeology Team completed emergency salvage of burials found in a Georgetown basement crawl space, part of an undocumented cemetery. We have visited this block on multiple occasions and believe that the cemetery likely served Georgetown's large African American community—both enslaved and free—in the first half of the nineteenth century. Historical research indicates the cemetery was pressed into use for victims of the 1832 Cholera Pandemic as well. The pandemic is poorly documented in official District records with no reliable statistics on numbers of infected, dead, or recovered however, contemporary primary accounts such as newspapers, letters, and diaries reflect a high death toll especially among marginalized groups. Victims often died at home and were rapidly buried in both formal and informal cemeteries. Analysis of the recovered remains awaits post-COVID reopening and will include determining if any individuals were cholera victims. Until then, we are researching the archaeology of epidemic cemeteries and preparing a bibliography. Do you know of a documented burial ground for victims of a disease epidemic? Was archaeology and/or bioanthropological analysis conducted? Please contact one of the authors if you have information to share.

Troccoli, Ruth [187] see Ames, Christine

Troncoso, Andres [9] see Alfonso-Durruty, Marta

**Trusler, Kate (University of Missouri), Gwen Martin-Apostolatos (University of Missouri), Wayne Lorenz, Jessica Bernstetter and Amie Green****[167]***Around the Neighboring Watering Hole: Comparative Analysis of Fountains in Pompeii and Herculaneum*

Substantial urban development is linked to the first century CE in Pompeii and Herculaneum, as well as throughout the Bay of Naples. An important component of this development included the construction of the Aqua Augusta, or Serino Aqueduct as it is known today. The associated lead pipe network supplied pressured water for private residential display, businesses, and public fountains. Water collected from public fountains was especially valuable as population density increased and more people came to live in apartments that lacked traditional means of water collection (e.g., cisterns). In the summers of 2018 and 2019, the authors conducted fieldwork in order to investigate the fountains at Pompeii and Herculaneum. Our initial research focused on the fountains in Pompeii. However, the question remained, are all fountains in the Roman world the same? This paper expands on previous research and focuses on the significant differences in construction and use-wear of fountains between the neighboring towns.

**[167]***Chair*

Tryon, Christian [100] see Borreggine, Marisa

Tsukamoto, Kenichiro [22] see Jonassen, Alexandra

Tsukamoto, Kenichiro [22] see Ramirez, Estevan

Tsukamoto, Kenichiro [140] see Sullivan, Kelsey

**Tucker, Kaley (University of Utah Archaeological Center), Lisbeth Louderback (Natural History Museum of Utah) and Erick Robinson (Utah State University)**

[7]

*Evidence for Geophyte Exploitation in the Green River Basin of Wyoming*

In the Green River Basin of Wyoming, archaeological sites dating from the Early Archaic to Late Prehistoric are often found associated with or adjacent to dense patches of *Cymopterus bulbosus*, a nutritious geophyte that would have been an important food source for prehistoric humans living in the region. Experimental data have shown that the caloric return rates of *C. bulbosus* were enough to support seasonal exploitation by foragers, yet there has been no direct evidence for the use of this geophyte from the archaeological record. We examine starch granules from 10 ground stone tools excavated from two archaeological sites in the Green River Basin to determine if *Cymopterus* was collected and consumed in the past. Taproots of *C. bulbosus* were collected from two populations in the immediate vicinity of the archaeological sites in order to develop a modern starch reference. Positive identification of *Cymopterus* starch granules is based on a systematic study of those reference granules. The presence of *Cymopterus* starch on the artifacts suggests that prehistoric foragers were collecting and consuming these geophytes. These findings support previous hypotheses about geophyte use in southern Wyoming and have implications for increasing human populations as well as settlement and subsistence decisions.

**Tuitavuki, Kylie (University of Hawai'i at Manoa)**

[190]

*Discussant*

Turkewitz, Cecelia [19] see Johnson, Camille

**Turner, Bethany (Georgia State University), Molly Zuckerman (Mississippi State University, Starkville) and Haagen Klaus (George Mason University, Fairfax)**

[127]

*Doing Context-Specific, Anthropological Bioarchaeology: Hard Times from England to the Andes*

The concept and approach of "bioarchaeology as anthropology," wherein bioarchaeology is framed as interdisciplinary, hypothesis-driven, biocultural, cross-cultural, and focused on understanding the adaptation and evolution of social systems, was pioneered by George Armelagos and has been progressively strengthened and amplified by the work of Debra Martin. Her prolific body of work has particularly emphasized the crucial importance of operationalizing social theory, and rigorously engaging with "culture" as multidimensional, dynamic, and contingent. In doing so, Martin creates deeply contextualized interpretations of human remains that provide emic explanations of complex biocultural phenomena in past societies, such as violence. Here, we demonstrate the continuing power, scope, and applicability of her approach—particularly for investigations of structural violence in past societies, as well as resistance to it—through two diverse case studies. The first uses osteological and multi-isotopic analyses in Spanish colonial Lambayeque, Peru, to theorize indigenous foodways as avenues of cultural resilience. The second investigates skeletal evidence of poor women's agency in seeking treatments for syphilis infection in post-medieval England despite gendered social inequality and misogynistic medical ideologies that historical records suggest greatly limited access to treatments. These disparate examples help underscore Martin's significant influence in shaping an anthropological, twenty-first-century bioarchaeology.

Turner, Michelle [26] see Schleher, Kari

Turner, Michelle [26] see Schwindt, Dylan

**Tushingham, Shannon (Washington State University)**

[175]

*Beyond Processors: Leadership, Risk, and Decision Making among Women in Anarchic Societies*

Anarchic societies resist despotic rule and centralized political power. Such systems are far from chaotic and developed and prospered throughout much of western North America. Both human behavioral ecology (HBE) and anarchist theory offer explanatory frameworks for understanding heterarchy as well as the emergence of (and resistance to) complex political systems and leadership. Leadership models largely focus on elucidating the conditions under which top-down (largely male) leadership emerges. Household-level dynamics, leadership, and decision making by women, however, remain largely underexplored areas of research, relegated to a supportive or secondary status. In this paper I that argue women's leadership and risk-averse strategizing are key to understanding the evolution and stability of anarchic societies, which are typified by highly productive yet small, autonomous foraging groups in much of western North America. While women's work is so often the "white noise" of explanatory models, in reality, women were key players who actively maintained social and economically independent households and engaged in a number of critical risk-buffering strategies. Small social units and household autonomy was actively maintained through social and economic means, including intensification of back-loaded resources, resource ownership/control and storage, information sharing, and household flexibility and fluidity.

Tushingham, Shannon [144] see Fulkerson, Tiffany

**Tykot, Robert (University of South Florida) and Andrea Vianello (University of South Florida)**

[191]

*Sources and Distribution of Palmarola Obsidian in the Central Mediterranean during the Neolithic*

The tiny island of Palmarola, about 35 km south of Cape Circeo (between Rome and Naples, Italy), was an important source of obsidian during the Neolithic in the Central Mediterranean. While thought to have been a minor source, compared to Lipari and Sardinia, extensive artifact analyses in recent years of museum and other collections show that Palmarola obsidian was widely distributed, although the use of nondestructive pXRF spectrometers were not capable of distinguishing the three source subgroups identified through geological survey and analyses by INAA and LA-ICP-MS. Analysis by pXRF has enabled testing of complete archaeological assemblages and has led to the identification of Palmarola obsidian within lithic assemblages at more than 60 archaeological sites throughout peninsular Italy as well as in Corsica, southern France, the Adriatic, and Croatia. Very rarely, however, was Palmarola the only obsidian source used at the archaeological sites that have been tested, and it was the major source at only 25%. The techno-typological characteristics of each artifact were also recorded in order to assess potential production and use patterns. When possible, the contexts and chronology of the lithic assemblages were incorporated in assessing and enabling potential statistical comparisons over time, space, and raw material.

Tykot, Robert [125] see Peña, José

Tykot, Robert [20] see Taylor, Corinne

Uchida, Junko [141] see Mizoguchi, Koji

**Ugalde, Paula (University of Arizona), Virginia McRostie (Pontificia Universidad Católica de Chile), Eugenia Gayo (Center for Climate and Resilience Research [CR] 2), Claudio Latorre (Pontificia Universidad Católica de Chile) and Calogero Santoro (Universidad de Tarapacá, Chile)**

[114]

*Sociocultural Trends and Innovations along 13,000 Years of Plant Use in the Atacama Desert, Chile*

In the Atacama Desert, plant resources are scarce and unevenly distributed due to water availability. However, by compiling all the available archaeobotanical evidences since the late Pleistocene (ca. 13,000 BP) until the Inka epoch (ca. 450 BP) in a single database, we demonstrate that populations ranging from mobile hunter-gatherer bands to sedentary people relying on agriculture managed plants from coastal, highland, and tropical forest ecosystems. Furthermore, we show that people established routes of interaction to acquire plant resources from very long-distance locations (>600 km). We also demonstrate that by the Formative period (>3000–1500 cal years BP), the introduction of a wide range of farming crops, water control techniques, and cultivation of diverse plants not only ended the chronic shortage of plants characteristic of a hyperarid environment, but marked the establishment of a set of staple foods for the Atacama Desert dwellers. Later, under the rule of centralized societies such as the Inka, people mostly intensified the cultivation of maize. By contrasting the trends of plant utilization along this cultural sequence with sociocultural changes and paleodemographic and climatic fluctuations, we note that the “green revolution” of the Formative coincides with an exponential increase in the number of people inhabiting the Atacama.

[114]

*Chair*

**Ugras, Funda, Tamer Mertan, Müge Ergun, Tammy Buonasera and Mihriban Özbasaran**

[31]

*Comparing Technological Choices for Grain Processing at Aşıklı Höyük, an Early Neolithic Village in Turkey: Experimental Removal of Chaff from Barley (*Hordeum vulgare*)*

Experimental studies can make significant contributions to understanding the function of grinding stones found in archaeological contexts. Milling technology at the early Neolithic site of Aşıklı Höyük in Turkey is dominated by querns or grinding slabs, but mortars and pestles are not uncommon. Most of the mortars at Aşıklı Höyük are conical block mortars found in proximity to grinding slabs. Unlike the grinding slabs, which are strongly associated with flour production, principal functions of the conical mortars are less certain. The mortars may have expanded processing capabilities to resources like wild nuts, fruits, and herbaceous plants, or they could have been important for dehushing grains prior to flour production. Our experiments compare the effectiveness of two types of pestles (basalt and wood) for dehushing hulled barley (*Hordeum vulgare*) in a conic basalt mortar, under two conditions (with and without water). We note that the process of dehushing is more effective when water is added, and that productivity is less affected by the choice of the pestle. Importantly, the experiments also allowed botanical remains from the different processing methods to be analyzed, which provides important insights to assess past crop processing and dehushing practices. We report on these results as well.

**Ullah, Isaac (San Diego State University)**

[6]

*A Sediment Granulometry Approach to Anthropogenic Landscape Impacts*

Sediment granulometry, also known as Particle Size Distribution Analysis (PSDA), is the analysis of the frequency of differently sized particles present in a sediment sample. I present a new workflow for applying PSDA to understanding past human impacts at the landscape scale. The workflow combines PSDA of both the fine (0.1 to 1,000 microns) and coarse (>1,000 microns) fractions of sediment to document the frequency of particles from the clay to cobble size ranges. PSDA of fines is conducted via the Electrical Sensing Zone technique using a Beckman Coulter Multisizer 3 particle size analyzer. PSDA of the coarse fractions is conducted via

mechanical sieve separation. Important changes in landscape dynamics are identified by analyzing the changing frequency of different particle size classes at depth in columns of sediment gathered at strategic points on the landscape. These patterns are linked to changes in human land-use practices that altered the dynamics in surface water flow, and, thus, also altered the dynamics in particle transport and deposition. We will use the results from a set of initial exploratory case studies (California, Kazakhstan, Jordan) to demonstrate the challenges and validity of the approach.

Urban, Thomas [34] see Graf, Kelly

**Uribe, Mauricio, Camila Riera-Soto (University of Cape Town) and Petrus le Roux (University of Cape Town)**

[125]

*Pottery Traditions in the Hyperarid Core of the Atacama Desert: Petrography and Geochemistry of Iluga Túmulo Ceramics (Tarapacá, Northern Chile)*

The Iluga Túmulo site (900 BC–AD 1600) is an archaeological area of great significance, with abandoned agricultural and public structures partially buried by aridization processes. It represents a record of multiple cultural occupations, which started in the Early Formative and continued until Inca and Spanish times. Among mounds, squares, and different structures is a surface covered with different archaeological materials. Ceramics are certainly the most abundant material with examples from the Early and Late Formative; Late Intermediate of the western valleys and altiplano; and imperial, provincial, and local specimens of Inca times, as well as Hispanic colonial pieces. The goal of this research is to extend the study of ceramics through petrography (thin sections) and geochemistry (major, minor, and trace elements and radiogenic isotopes). Results obtained are crucial to explain the existence and development of ceramic traditions in Tarapacá, allowing us to also comment on other social issues. Particularly, the transmission of knowledge, possible sources, and choices of raw materials, paste recipes, circulation, and exchange of vessels between populations in the south-central Andes. Our purpose is to define human group circulation through ceramic raw materials, using a novel database of ceramic petrography and geochemistry for northern Chile.

**Uribe Chinen, Claudia (University of Tsukuba)**

[193]

*Reinventing the Tradition: Archaeological Heritage and Contemporary Local Counternarratives in Huaca Fortaleza de Campoy (Lima, Peru)*

Throughout Peru's consolidation as a modern nation-state, the role of ancient monuments of the prehispanic past has been intertwined with politics, grounded in narratives of glory and grandeur while mostly stressed in nation-building contexts and the pursuits of nation-ness and national identity. This paper develops a critical and reflexive approach to the dominant discourse and praxis in archaeological heritage, framed in terms of hierarchy and scientific knowledge. Moreover, this presentation offers a reflection on contemporary counternarratives emerging from local communities in marginalized areas. Based on interviews and archival research, this study describes the case of Huaca Fortaleza de Campoy, an archaeological site located in the district of San Juan de Lurigancho, in the inner peripheries of the city of Lima. For over 10 years, local communities have engaged with the prehispanic material culture and participated in creating values and meanings through the celebration of "Inti Raymi." Contesting archaeological sites' governmental management approaches, these groups attempt to reactivate the heritage site's role in their lives and raise awareness of its significance. This paper ultimately argues for greater attention to the bottom-up processes of heritage-making and the recognition and empowerment of local communities as stewards of archaeological heritage.

**Urquijo, Pedro (Universidad Nacional Autónoma de México)**

[71]

*Territory and Ritual Landscape in the Colombino Codex: Oaxaca Coast, Mexico*

Through a geographical and historical analysis, we propose to interpret the territorial and ritual organization of the landscapes in the Colombino Codex, which alludes mainly to the heroic feats of Lord 8 Venado Garra Jaguar, in the Mixteca Coastal region in Oaxaca. The Codex Colombino, the only one preserved in Mexico, forms a unit with the Codex Becker I, which is preserved in Vienna, Austria. Among other specialists, it has been studied by Alfonso Caso, Mary Elizabeth Smith, and Manuel Hermann Lejarazu. Our specific objective is the elaboration of a map that allows the interpretation of the toponyms, the elements of the landscape and its dynamics, as much in the physical and tangible space as in the liminal and sacred one (Cosmo-landscape).

Uruñuela, Gabriela [30] see Torres Porras, Alicia

**Vacca, Kirsten (University of Hawai'i, West O'ahu)**

[190]

*Moderator*

**Vaiglova, Petra (Washington University in St. Louis), Gideon Hartman (University of Connecticut) and Guy Bar-Oz (University of Haifa)**

[68]

*Climate Stability and Societal Decline on the Margins of the Byzantine Empire in the Negev Desert*

In the absence of a high-resolution climate archive in Negev Desert, southern Israel, it has been challenging to understand why the Byzantine Empire built large towns in this arid region in the fourth century CE—and why it abandoned them three centuries later. In this study, we use dietary and mobility patterns of animals recovered from three Byzantine Negev settlements to assess possible

climatic shifts that may have led to the collapse of the Byzantine society in this region. Matching stable isotopic sequences from tooth enamel (carbon,  $\delta^{13}\text{C}$ , and oxygen,  $\delta^{18}\text{O}$ ) and tooth dentine ( $\delta^{13}\text{C}$  and nitrogen,  $\delta^{15}\text{N}$ ) are used to trace possible changes in the region's vegetative cover and the animal's grazing behavior; phenomena that would have responded to climatic fluctuations. The interpretations draw on distinction between "contracted" vegetation (i.e., inside drainage channels) and "expansive vegetation," the availability of which sheds light on the micro-climatic conditions in the desert between the fourth and seventh centuries CE. The combined proxies contradict an earlier proposition that the region was wetter during the Byzantine period and that climatic deterioration caused the abandonment of these large settlements.

**Vail, Gabrielle (UNC-Chapel Hill)**

**[59]**

*Chair*

**Val, Aurore (Universität Tübingen), Paloma de la Peña (University of the Witwatersrand), May Murungi (University of the Witwatersrand), Frank Neumann (University of the Witwatersrand) and Dominic Stratford (University of the Witwatersrand)**  
**[151]**

*On the Edge of the Kalahari: New Excavations of the Middle Stone Age Deposits at Olieboomspoort, South Africa*

Olieboomspoort is one of the few rockshelters in South Africa documenting phases of use going back to the Acheulean and up until the very end of the Later Stone Age. Previous work has focused on the recent phases, consistent with traces left by the last hunter-gatherers present in the area. Little is known about the earlier phases of occupations of the shelter, predominantly associated with the Middle Stone Age (MSA). For a start, the chronology of the MSA units is unknown. The MSA material is dominated by lithic artifacts excavated from two test-trenches respectively in 1954 and in 1998. This was attributed to the somewhat ill-defined Pietersburg industry and still awaits full techno-typological analysis. Finally, the depositional and postdepositional context of the archaeological finds remains unclear. In 2018, we started a new field project, with the following aims: (1) to provide a clearer chronological context for the MSA layers, (2) to clarify the stratigraphy and site formation processes, and (3) to technologically reevaluate the lithic assemblage. Here, we provide some background on the site alongside preliminary results on the archaeological (lithic artifacts) and organic (faunal remains, pollen, and phytoliths) content of the deposits and on-site formation processes.

**[151]**

*Chair*

Val, Aurore [151] see Ricci, Giulia

Valdes Herrera, Alejandro [55] see Punzo Díaz, José Luis

Valdez, Rafael [16] see MacDonald, Brandi

Valentín, Norma [50] see Velazquez, Adrian

**Vallejos, Joshua (University of New Mexico; Statistical Research Inc.)**

**[99]**

*Degrees of Change: The Transition from Paleoindian to Archaic*

The transition between the Paleoindian (13,000–8000) and Archaic (8000–1000) periods continues to elude North American archaeologists. It is inferred from archaeological evidence that human populations were nomadic hunter-gatherers during both periods. The creation of storage pits, however, provides evidence for some seasonal sedentism during the Archaic period. This development may have been influenced by climate change at the end of the Ice Age. Stable isotopic analysis of faunal remains allows archaeologists to capture a snapshot of past climate in a given area. Water Canyon in Magdalena, New Mexico, has yielded two overlapping bison kill sites. The older kill site dates to the Late Paleoindian while the younger site dates to the Early Archaic. Stable isotopic analysis can be performed on the bison remains to determine the paleoecology of the area for two different periods. Data derived from stable isotopic analysis may then provide archaeologically based evidence for the effects of climate change as a factor contributing to cultural continuity and change in the American Southwest. The transition from nomadic lifestyles to seasonal sedentism in the region, for example, may have been influenced by environmental agents visible within isotopic signatures.

**Vallejos, Joshua (University of New Mexico; Statistical Research Inc.)**

**[190]**

*Discussant*

**Van Alstyne, Benjamin (UNLV), Karen Harry (UNLV) and Daniel Perez (UNLV)**

**[46]**

*Archaeological Investigations at a Multicomponent Site on the Shivwits Plateau*

During the summer of 2019, members of the University of Nevada, Las Vegas excavated two rooms within Pete's Pocket, a Virgin Branch Pueblo cultural site located on the Shivwits Plateau in Arizona. The rooms, which were located about 300 m from the north rim of the Grand Canyon, were contiguous and circular, forming an almost figure-eight shape. An unusually large amount of architectural rubble was associated with one of the rooms, suggesting it likely had been a tower. The second room contained numerous handstones and sandstone on its floor. The implications of these findings are discussed.

Van Den Bussche, Ron [30] see Singleton, Robin

**Van Dyke, Ruth (Binghamton University)**  
[108]

*Materiality and Memory in Northwest Iberia: Water, Metal, and Stone*

In this paper, I explore the attractant qualities of water, metal, and stone as they have intertwined with human memory-making over three millennia in northwest Iberia. During the Bronze and Iron Ages, the confluence of the Rios Sar and Ulla may have been an important liminal space, as people consigned weapons and other metal implements to their depths. The rivers attracted sea traders, connecting them with inland sources of tin and gold. Romans brought the watery cult of Neptune when they established the stopover of Iria Flavia along the Via XIX. Centuries later, Christians transformed an altar to Neptune into El Pedrón—the stone believed to be the anchor for the boat that brought the body of Santiago up the Rio Sar. Today, this ancient, repurposed stone and the church that houses it is an important part of Catholic and tourist pilgrimage to Santiago de Compostela. Working from published archaeological and historical investigations, I trace the role of materials in the construction of memory over time in and around Padrón, Galicia.

van Keulen, Fred [32] see Ahlman, Todd

Vandergugten, John [24] see Waters, Albert

**VanDerwarker, Amber (UCSB Anthropology)**  
[81]  
*Chair*

VanDerwarker, Amber [81] see Meyers, Maureen

Vandiver, Pamela [44] see Klesner, Catherine

**Varela, Carlos (Universidad Nacional Autónoma de México)**  
[94]

*Casting the Net: Evidence of Fishing and Fish Farming in Palenque, Chiapas, Mexico*

Mesoamerica is a region with highly biodiverse ecosystems, from temperate forests to tropical jungles, and where civilizations impacted the landscape in different ways. In several Mesoamerican cities, zooarchaeologists have found evidence for animal management and breeding practices to supply the population with resources. Recent research indicates that Palenque was a regionally important city that had a major impact on its landscape over time. Owing to Palenque's high population density—approximately 3,000–4,000 inhabitants per km<sup>2</sup> toward the end of the eighth century AD—the city's residents needed to devise multiple methods to provision the ever-increasing population with a constant, and sustainable, supply of food. Examples of this include intensive planting techniques such as terraces and irrigation canals. Due to the high proportions of freshwater fish recovered at the site, this paper presents evidence of the exploitation of streams, swamps, rivers, and lagoons in the Palenque region during the Late Classic period. I will also present the possibility of managing and cultivating freshwater fish in several pools detected in the city, highlighting the great knowledge about the biology and ecology required for successful production.

**Vargas, Juan Pablo (GAD Municipal del Cantón Cuenca) and Felipe Manosalvas (GAD Municipal del Cantón Cuenca)**  
[90]

*Cuenca, patrimonio y arqueología: Hacia un plan de gestión*

El desconocimiento sobre la relevancia del patrimonio arqueológico existente en el cantón de Cuenca, ha limitado la implementación de soluciones, lo que ha resultado en carencia de capacidad operativa, administrativa, legal, económica, de educación y valoración. La ausencia de estos elementos estructurales consecuentemente limita la investigación, salvaguarda, conservación y comprensión de dicho patrimonio arqueológico. Estos vacíos han provocado la ausencia de un modelo eficiente de gestión del precitado patrimonio en el cantón, que a la fecha ha dado como resultado la destrucción y desaparición parcial o total de la evidencia material de los grupos sociales que ocuparon el territorio durante los periodos prehistórico, inca, colonial, republicano. De igual manera sucede con las evidencias del desarrollo industrial, que comprende el periodo histórico, de relevancia para la identidad de la comunidad cuencana. El presente trabajo, demuestra el corpus de la evidencia arqueológica existente en el Cantón, a manera de diagnóstico y propone un plan de gestión sobre el recurso patrimonial arqueológico y paleontológico, con el fin de generar proyectos a corto, mediano y largo plazo, que permita mayor conciencia, respecto, así como interés hacia estos bienes.

Vargas, Juan Pablo [149] see Yamamoto, Atsushi

Varien, Mark [26] see MacMillan, Vincent

**Varley, Emily (University of Southern California)****[70]***Social Spaces of Central Italy and the San Giuliano Archaeological Research Project*

Every space humans inhabit tells a story about the cultural values, social norms, and lives of those who utilized the space. This paper focuses on the archaeological remains of a medieval fortification and presumed castle located in Barbarano Romano, Italy, atop the San Giuliano plateau. I will discuss the excavated ruins as a source of data for understanding how this castle was once a social space as well as examining the implications the space likely had on social actors who interacted because of the fortification. By integrating material evidence collected over four years of excavation, historical sources, and spatial analysis, I will draw conclusions about the space and how it reveals cultural values and social norms and stories of those who lived there.

Vasquez, María [63] see Frutos, Alberto

**Vaughn, Colleen (US Department of Transportation)****[49]***Discussant***Vaughn, Kevin (UC Riverside)****[128]***Discussant*

Vázquez-de Ágredos-Pascual, Maria Luisa [50] see López-Puértolas, Carlos

Vega, Enrique [150] see Hendrickson, Mitch

Vega Barbosa, Alma Noemi [180] see Kindl, Olivia

**Velasco Fuentes, Rocío (Universidad Nacional Autónoma de México), Marisol Reyes Lezama (LANCIC-Instituto de Química, UNAM), Mayra León Santiago (LANCIC-Instituto de Química, UNAM) and Everardo Tapia Mendoza (LANCIC-Instituto de Química, UNAM)**

**[133]***Uso de resinas en el Centro de Veracruz: El caso de los braseros y sahumerios de los sitios arqueológicos de Nopiloa y El Zapotal*

Nopiloa y El Zapotal se localizan en una sub área cultural conocida como la Mixtequilla, en el estado de Veracruz, México. Durante las excavaciones, realizadas en los años 1940s y 1970s, en ambos lugares se recuperaron varios sahumerios y braseros, objetos cerámicos relacionados a prácticas rituales, en lo que solían depositarse distintos tipos de ofrenda, principalmente resinas como el copal (burseras), plantas como el yauhtli o pericón (tagetes lucida) y sangre. Además de analizar las formas, las decoraciones y la distribución regional, se indagó sobre el tipo de sustancias que se depositaron en estos objetos, para ello se tomaron muestras (barro en polvo) de algunos ejemplares resguardados en las bodegas del Museo de Antropología de Xalapa, en Veracruz, México, mismas que se procesaron mediante dos técnicas: Espectroscopia Infrarroja por transformada de Fourier y Cromatografía de gases acoplada a espectrometría de masas, esto en colaboración con el Laboratorio Nacional de Ciencias para la Investigación y la Conservación del Patrimonio Cultural, sede Instituto de Química de la Universidad Nacional Autónoma de México. Así, en algunas muestras se identificaron resinas de copal (alpha amyrin, beta amyrin, lupeol) y resinas de pino (retene, methyl dehydroabietate).

Velásquez, Antolín [132] see Sion, Julien

**Velásquez García, Erik (Instituto de Investigaciones Estéticas de la UNAM)****[76]***Los gobernantes de la dinastía Kaanu'1 en Dzibanché, Quintana Roo, México*

Diversos hallazgos arqueológicos en Dzibanché (Kaanu'1) y en otros sitios de las tierras bajas mayas orientales han revelado que el asiento original de los gobernantes de la dinastía Kaanu'1 o "Cabeza de Serpiente" se encontraba en el sur del actual estado mexicano de Quintana Roo. En esta ponencia se ofrecerá un recuento de la información disponible hasta el momento, para conocer el devenir de los mandatarios mayas de ese linaje gobernante, antes de que una rama de ellos se escindiera en 635–636 dC y se asentara en Calakmul (Huxte' Tuun). No obstante, aún después de que una parte de la dinastía se asentara en el sur de Campeche, tenemos evidencia de que el núcleo de esa familia gobernante continuó habitando por tiempo indefinido en Dzibanché.

Velazco, Bryan [69] see Cusicanqui, Solsiré



**Velazquez, Adrian (Museo del Templo Mayor, INAH), Norma Valentín (INAH) and Belem Zúñiga (Proyecto Templo Mayor)**  
**[50]**

*Archaeological Mollusks from Xalla*

The project "Teotihuacan Élite y Gobierno" (Teotihuacan Elite and Government) has excavated 420 artifacts made of mollusk shells. Ninety-one of them are objects and 166 are valves or fragments that present traces of human modification; 163 are fragments with no traces of human work. In this paper the results of the analyses carried out on this collection are presented, including biological, typological, and technological aspects.

Velésquez, JuanLuis [48] see Balcarcel, AnaBeatriz

Véliz, Vito [89] see Pineda de Carias, Maria-Cristina

**Venter, Marcie (Murray State University) and Lacy Risner (Murray State University)**  
**[122]**

*Situating a Cached Ballgame Yoke from Matacanela, Veracruz*

The ballgame complex was an important component of the Classic Veracruz style that spanned the Late or Epiclassic period (AD 600–900) and that was concentrated along the Mesoamerican Gulf lowlands and extended into adjacent regions. The ballgame, however, has early roots, both in Mesoamerica in general and in Veracruz in particular. In this paper, we will situate stylistically, spatially, and temporally a broken yet complete stone ballgame yoke recovered from an in situ Late Classic offering context at the Classic period center Matacanela, located in the south-central Tuxtla Mountains. Although the date of discard and interment was during the Late Classic, we examine how this yoke compares with the broader corpus of carved stone yokes and consider processes of curation, authority, place-making, and memory in ancient Mesoamerica.

**Vepretskii, Sergei (Russian State University for the Humanities), Dmitri Beliaev (Russian State University for the Humanities), Monica de Leon (Atlas Epigráfico de Petén) and Camilo Luin (Popol Vuh Museum, Guatemala)**  
**[152]**

*Archaeological Reconnaissance and Excavations at El Encanto (Petén, Guatemala) in 2018*

The Maya site of El Encanto is situated 12 km to the northeast from Tikal epicenter. Discovered in 1907 and occasionally visited by various projects throughout the twentieth century, it has never been the subject of large-scale excavations. Based on the map by the University of Pennsylvania Tikal project in 1964 that included two groups, El Encanto was interpreted by Dennis Pulestone as a "minor center" within larger Tikal. In 2018 Atlas Epigráfico de Petén project conducted two weeks of fieldwork that included mapping of the site and test-pit excavations in the South Group. The site turned out to be significantly larger and included at least four large architectural groups with two internal causeways. The Southern Group, which is dominated by a 14 m pyramid, played the role of a ritual center. The Northern and Western groups, apparently, had an administrative and residential character. The occupation of El Encanto goes back to the Middle Preclassic; the construction of the South Group started in the Late Preclassic or Protoclassic. The latest levels are dated to the Late Classic. We suggest that El Encanto should not be regarded as a "minor center," but as a middle-level urban community within Tikal periphery.

Vepretskii, Sergei [76] see Helmke, Christophe

Vera, Sergio [125] see De La Fuente, Guillermo

Verano, John [182] see Schaefer, Benjamin

**Verdugo, Cristina (University of California, Santa Cruz), Lars Fehren-Schmitz (University of California, Santa Cruz) and James Brady (California State University, Los Angeles)**  
**[158]**

*The Question of Sacrifice: Examining Maya Mortuary Practices through the Lens of Midnight Terror Cave*

As bioarchaeological interest in the question of ancient Maya ritual violence developed in the 1960s, it was generally recognized that sacrifice and related violent practices occurred within the social context of ritual. It should be expected, then, that caves would produce sacrificial osteological assemblages since they are also considered to be sites devoted to ritual. Despite this, there is still considerable debate regarding the significance of human skeletal material in caves. Historically, human sacrifice has been disregarded as an explanation for human remains found in caves. More recently, standards for distinguishing sacrifice from burial have been developed. Employing a multidisciplinary analysis of the Midnight Terror Cave (MTC) skeletal assemblage, we address the question of burial as opposed to sacrifice. The approach is novel in requiring that those arguing for burial specify a particular form that can be compared with the data. Here, ossuary burial is compared with a sacrifice model to determine which more closely fits MTC. Results clearly indicate that human sacrifice occurred at MTC and outline the implications of this research for Maya caves.

**[158]**

*Chair*

**Vernon, Kenneth (University of Utah), David Zeanah (California State University, Sacramento), D. Craig Young (Far Western Anthropological Research Group Inc.), Robert Elston (University of Nevada, Reno) and Brian Coddig (University of Utah)**  
[95]

*Explaining Paleoindian Settlement in the Intermountain West: A Regression Adjustment Approach*

Identifying the ecological drivers of Paleoindian settlement has broad implications for a host of related behaviors, including colonization, mobility, and subsistence. Unfortunately, important proxies like spatial site patterning suffer from well-known sampling biases, most notably, taphonomic decay, opportunistic survey, and imperfect detection. To address these biases and reliably evaluate hypotheses regarding the ecological motivations for Paleoindian settlement, we draw on recent advances in the allied field of ecology, where scientists face structurally similar challenges. Specifically, we implement a hierarchical modeling approach known as "regression adjustment," which leverages data from multiple species to model both the spatial distribution of a target species and its potential for biased sampling. In this case, we draw on the entire archaeological record of our study region, Grass Valley, Nevada, to model the distribution of just one population, its Paleoindian colonists.

**Vianello, Andrea (University of South Florida)**

[73]

*Discussant*

**Vianello, Andrea (University of South Florida)**

[174]

*The First Quarantine: Lessons from Past Epidemics*

In a world changed by COVID-19, it is valuable to look at past reactions to epidemics and learn from them. Modern economies and political systems are designed with the assumption that such events cannot happen. The real risks in food and staples production and distribution in America and Europe or the inability to protect the work force for just a few months expose structural problems. And yet microbes and human beings have been locked in coevolution since our species appeared, and more so in the last two centuries after a rapid increase in human population. Studies for a new project in the island of Lazzaretto Vecchio, Venice, Italy, the first quarantine in the world, as well as data from major epidemics in historical periods will inform a brief overview of what works and what does not with epidemics. Masks, lockdowns, economic impact, morbidity and death, quacks and physicians in competition, little is new but the people experiencing the epidemic. I will present some ideas for future research in the project, and how the current pandemic is reshaping the project and its priorities.

Vianello, Andrea [191] see Tykot, Robert

**Vidal-Guzmán, Cuauhtémoc (George Washington University)**

[102]

*Where Text Meets Trowel: Using an Integrative Approach to Consider Internal Sociopolitical Dynamics at Postclassic Etlatongo*

The Mixteca Alta of Oaxaca is fortunate to have an impressive corpus of pre- and postconquest ethnohistorical sources that have been the focus of intensive academic scrutiny. Yet, emphasis on these sources provides an incomplete picture where only the histories of polities mentioned in the texts are taken as central, often to the detriment of lesser-known sites around the area. Such is the case of Etlatongo, a polity located at the center of the Nochixtlán valley but in the periphery of postclassic Mixtec academic discourse. In this paper, I highlight one of the many important contributions of Michel Lind to the field of Mesoamerican studies by employing an approach that he championed throughout his entire career: the critical blending of ethnohistorical and archaeological data to fill the crevices left by using one source of information over the other. I discuss how such an approach forces us to rethink the internal sociopolitical dynamics of Postclassic Etlatongo, and in doing so, reconsider the importance that sites barely mentioned in the codices can play to advance our knowledge of Mixtec history.

**Villareal, Alessandra (University of Texas, San Antonio)**

[61]

*Middle Preclassic Ceramic Distribution in Western Belize: A Comparative Study from Early Xunantunich*

The value of ceramic sherds and vessels to the archaeologist extends far beyond the chronology of a site. Ceramic production and distribution data, for example, reveal information about ancient lifeways, ideologies, and movement across a landscape, ultimately telling us more about the people behind the pottery. In this paper, I will discuss the methods that archaeologists use to track ancient ceramic production and distribution—including formal and typological analyses, as well as mineralogical and compositional testing. A case study from the Mopan River valley in western Belize compares ceramic assemblages from the hinterland site of San Lorenzo and the ritual center of Early Xunantunich to build an understanding of how ceramics are differentially produced and distributed across these two contexts. The goal of this study is to highlight the social, ritual, and economic relationships between the sites that are materialized in the ceramic assemblages. Further comparison to assemblages from the sites of Cahal Pech and Barton Ramie, both situated west along the Belize River, reveals broader regional patterns of distribution, suggesting that, while Early Xunantunich maintained a relationship with these sites, they also produced their own variety of ceramics.

**Villasenor Iribe, Eunice (Arizona State University) and Christopher Morehart (Arizona State University)**

[155]

*Landscape Modification and Agricultural Production on Cerro Ahumada, Mexico*

Studying agricultural productivity and intensification elucidates the behavioral and demographic patterns of past societies. By understanding how physical environments were modified for agricultural use, it is possible to determine key economic and social processes. This paper presents the results of the analysis of terraces associated with the Epiclassic period (ca. 600–900 CE) site of Los Mogotes, located on Cerro Ahumada between the northern Basin of Mexico and the southern Mezquital valley of central

Mexico. We created GIS maps of terraces to determine their distribution. We have also produced estimates for the agricultural productivity of terraces, which sheds light on several important economic, political, and demographic characteristics. Finally, we integrate excavation data with ethnographic data on terraces to better ascertain other important functional and technological attributes of the terraces.

Villasenor Iribe, Eunice [177] see Morehart, Christopher

Viñas, Ramon [53] see Fábregas Valcarce, Ramón

**Vint, James (Desert Archaeology Inc.)**

[97]

*Stratigraphy and Chronology at Las Capas, an Early Agricultural Period Site in the Tucson Basin*

This paper discusses the stratigraphic chronology for the Las Capas site in the Tucson Basin, southern Arizona. Las Capas was inhabited by early farmers during the Late Archaic/Early Agricultural period (EAP), which dates from about 2100 cal BC to cal AD 50. Maize and canal irrigation were introduced during this interval. Settlement shifted from mobile hunting and foraging lifeways to a more place-focused mixed farming-foraging economy. Extensive excavations at Las Capas documented occupations within five distinct floodplain strata. Cultural features included dozens of pithouses, thousands of pits, human and canine inhumations, and canal-irrigated field systems. OxCal is used to model the site's chronology based on the stratigraphy, which is dated by 78 AMS radiocarbon and three OSL ages. The model divides EAP phases into relatively short intervals that provide the opportunity to study change through time within otherwise monolithic culture-historical phases 400 or more years in duration. Over two dozen other EAP sites have been excavated in the Tucson Basin, and more than 200 radiocarbon samples analyzed. The work at Las Capas and the evaluation of data from other sites indicate it is possible to model contemporaneity of EAP settlements in the Tucson Basin and refine the regional chronology in general.

**Viskanta Khokhriakova, Sandra (Russian State University for the Humanities), Alexandre Tokovinine (University of Alabama), Dmitri Beliaev (Russian State University for the Humanities) and Sandra Balanzario (INAH)**

[76]

*Nuevos datos, nuevas interpretaciones: Resultados preliminares de escaneo 3D y fotogrametría de algunos rasgos, monumentos y artefactos de Dzibanché*

This paper presents some preliminary results of the first field season of 3D documentation of buildings, monuments, and portable artifacts from the archaeological site of Dzibanché in Quintana Roo, Mexico. Four building facades, 20 stairway blocks, nine miscellaneous sculpture fragments, and six ceramic vessels were digitized with a structured-light system and/or structure-from-motion photogrammetry. Documentation took place at Dzibanché, in the INAH regional research center in Chetumal, and in the Maya Museum of Cancun. Part of the resultant corpus of imagery and inscriptions has not been previously disseminated in academic literature. The analysis of published texts and iconography has benefited from higher resolution and visualization tools made possible by 3D digitization. The presentation proposes several updates to the published interpretations of Dzibanché monuments and highlights how new additions to the corpus expand our understanding of its political history and ideology.

**Vlok, Melandri (University of Otago), Erdene Myagmar (National University of Mongolia) and Hallie Buckley (University of Otago, Dunedin, New Zealand)**

[93]

*Nutritional and Infectious Diseases in the Bronze and Iron Ages of Mongolia: The Archaeological Significance*

The identification of nutritional and infectious diseases in human skeletal assemblages has value for both bioarchaeologists and archaeologists for assessing the impact of particular biosocial and environmental contexts on health. This paper presents skeletal evidence of the nutritional diseases rickets, osteomalacia, and scurvy, and infectious diseases including possible brucellosis, tuberculosis, echinococcosis, and treponematoses in Bronze (~2500–400 BCE;  $n = 92$ ) and Iron Age (Xiongnu) (200 BCE–100 CE;  $n = 68$ ) human skeletal assemblages from Mongolia. The presence of these diseases in these contexts indicates considerable social change between the Bronze Age and Xiongnu, affecting the health of these populations. High rates of rickets and osteomalacia were found in both assemblages, whereas an increased presence of scurvy was identified in the Xiongnu. There is little increase in the prevalence of infectious diseases between the Bronze Age and the Xiongnu (3.3% vs. 5.9%). However, the diversity of different diseases increases from the Bronze Age to the Xiongnu, which may reflect the impacts of increasing migration and trade introducing new diseases. The presence of zoonotic infectious diseases in both assemblages highlight the intimate relationship between pastoralists and their herds from the Bronze Age onward, supporting the idea of intensifying pastoralism at this time.

Vokes, Arthur [183] see MacFarland, Kathryn

**Vranich, Alexei (UTSA)**

[45]

*The End of Tiwanaku*

The manner in which a polity collapses reveals a crucial facet of the relationship between the residents of the site and the surrounding population. For example, a brief, destructive end could indicate an adversarial relationship that boils over into a violent outbreak against an exploitative elite class. This presentation centers on the monuments of Tiwanaku, Bolivia (AD 500–1000), during the final active occupation of the site. Recent analysis and review of previous excavations attest to a change in construction and maintenance of the site around AD 900. The looting of previous ritual deposits corresponds to a new pattern of offerings: human

and camelid remains are deposited in alluvia accumulated over previously clean ritual surfaces adjacent to the monuments. These events last about a century, after which offerings and other evidence of organized activity cease. Undamaged, the primary iconography of Tiwanaku remain standing until the postcontact period. This combination of evidence suggests an abrupt structural change at the start of the tenth century, followed by a century of diminishing interest in the site.

**Wade, Mariah**

**[108]**

*Glass: Breathing into Matter*

Blowing into molten glass gave it form, a breathtaking invention of the first century BCE. Before that, glass vessels were made by using the core-forming technique and by casting, which were more expensive and less efficient methods. Glass blowing enabled the play of forms and color while making glass vessels more accessible to a wider market. This paper explores the mechanical and sensorial properties of glass, the relationship between container and content, the dichotomy between the production of exquisite forms and increased availability and how all those relate to the behavior of makers and consumers.

**[108]**

*Chair*

Wadley, Lyn [151] see Bader, Gregor

Wagner, Ursula [16] see MacDonald, Brandi

**Wai, Stefanie (McMaster University)**

**[15]**

*Mapping Pottery: Tracking Technological Style on the Taraco Peninsula, Bolivia*

While archaeologists in the last decade have made significant advances to the archaeology of Tiwanaku and the surrounding Lake Titicaca Basin in present day Bolivia, much remains unknown about the everyday domestic practices leading up to the rise of the Tiwanaku state. Moreover, few studies globally have attempted to explore the advanced use of GIS analyses for ceramics spatially at an inter-site level. Moving beyond the traditional research focus on monumental architecture in the basin, this research poster presents a preliminary analysis of Late Formative (200 BC–AD 450) plainware ceramics from three domestic sites in the region. I trace the spatial and temporal distribution of technological attributes, including paste, form, surface treatment, and finish within and across Kala Uyuni, Sonaji, and Kumi Kipa using GIS. I will explore the processes and changes in crafts production at these three sites, cross comparing their expressions of local practices, both shared and differentiated between them. This study addresses the applicability of GIS-based approaches to ceramic assemblages, and the challenges of working with data collected at multiple levels of resolution.

Walawalkar, Rohan [19] see Johnson, Camille

**Walden, John (University of Pittsburgh)**

**[56]**

*Moderator*

**Walden, John (University of Pittsburgh), Michael Biggie (Los Angeles Maritime Institute), Victoria Izzo (Texas A&M), Julie Hoggarth (Baylor University) and Rafael Guerra (University of New Mexico, Albuquerque)**

**[152]**

*Examining Intermediate Elite Relationships with Apical Elite Polity Rulers through Ritualization, Ancestor Veneration and District-Scale Identity Formation at the Late Classic Maya Polity of Lower Dover, Belize*

Traditionally anthropologists envisioned ritual as playing a functional role in the formation and ongoing cohesion of ancient complex societies. More recent perspectives consider ritual to represent a powerful tool of resistance, and therefore pivotal not just to the integration, but also the disintegration of polities. Situations in which a higher order polity forms among autonomous local elites can be insightful for investigating this dynamic. We reconstruct diachronic changes in ritual through examination of public architecture and associated artifact assemblages at the intermediate elite centers of Tutu Uitz Na, Floral Park, and BR-180/168, before and after the rise of the Late Classic Maya (AD 600–900) polity of Lower Dover, Belize. We show that some intermediate elites changed their traditional ritual practices to promulgate apical elite polity-scale identities and ritualized narratives, whereas other intermediate elites eschewed polity-scale ritual traditions and continued traditional ancestor veneration to legitimize their lineage and augment district-scale ties with commoner subordinates. The case study provides a glimpse into the ways in which local intermediate elite ritual and ceremony can either buttress or undermine the ideologies of their suzerains.

Walden, John [23] see Ellis, Olivia

Walden, John [67] see Izzo, Victoria

Walden, John [23] see Roa, Ian

Walden, John [152] see Shaw-Müller, Kyle

**Walder, Heather (University of Wisconsin, La Crosse), Marvin DeFoe (Red Cliff Band of Lake Superior Chippewa THPO) and John Creese (North Dakota State University)**  
**[105]**

*Contextualizing Mid–Late Archaic Period Copper Complex Sites of the Western Great Lakes*

The Frog Bay site (47BA60) is an intact, multicomponent archaeological site on the south shore of Lake Superior in Red Cliff, Wisconsin. Similar sites with significant Middle and Late Archaic components associated with the Old Copper Complex are known across the region, but Frog Bay is especially important because it is located within Frog Bay Tribal National Park, owned and managed by the Red Cliff Band of Lake Superior Chippewa, and it is being investigated in a collaborative, THPO-directed project. This paper contextualizes the Frog Bay site with similar shoreline and island sites in the Lake Superior basin, stretching from Grand Island, Michigan, to the east, westward to Thunder Bay, and along the north shore to Michipicoten, Ontario. The comparison both highlights unique aspects of Frog Bay and places it within a wider regional landscape of interaction.

**[105]**

*Chair*

**Wales, Nathan (University of York)**

**[55]**

*Integrating Grapevine Paleogenomics with Archaeobotanical Methods to Explore the History of Winemaking*

Genomic analyses of archaeological seeds and other plant remains are playing an increasingly important role in unraveling domestication histories. In some cases, these findings are revising long-standing interpretations developed from archaeobotanical methods, and questions remain on how archaeological and genomic methods can be synthesized into a cohesive whole. This project serves as an example of how conventional archaeobotanical methods can be incorporated into genome-wide analyses of archaeological remains, specifically to investigate the origins and spread of viniculture. Through a close partnership between archaeobotanists, grapevine geneticists, ampelographers, and ancient DNA researchers, we aim to better understand how humans transformed wild plants into productive vines, primarily for winemaking. By combining the results of geometric morphometrics and genetic characterization of thousands of genetic markers, we demonstrate that a synergistic approach is possible, and moreover, that our interpretations benefit from the insights of researchers from different disciplines. For the history of grapevines, the collaboration is leading to important discoveries about the longevity of vegetative propagation and the origins of key cultivars.

Walker, Chester [128] see Conlee, Christina

Walker, Chester [85] see Pantel, Agamemnon

**Walker, William (New Mexico State University) and Judy Berryman (New Mexico State University)**

**[37]**

*Ritual Closure: A Countermeasure to Witchcraft*

Archaeologists routinely encounter ceremonially closed buildings and sites yet specific explanations about why this occurs and how to frame it remain murky. For the American Southwest and likely many other parts of the world, fear of witchcraft may explain these closures. We argue in this poster that ritual burning and the inclusion of materials in the deposits of closed pueblo villages counteracted potential dangers of things falling into the wrong hands. Among southwestern peoples, ashes serve as an antidote and prophylactic against spiritually dangerous powers. Similar powers reside in projectile points. Indeed, in the Southwest the agency of many objects such as shell, turquoise, fossils, and crystals likely conditioned their inclusion in closure deposits. We conceptualize these additions as a form of temper used in a ritual technology to process the closure of Cottonwood Spring Pueblo, a large El Paso phase (AD 1300–1450) village on the western flanks of the San Andres Mountains of southern New Mexico.

Wallace, Michael [94] see White, Chantel

**Waller, Joseph (Jay), Jr. (PAL)**

**[103]**

*Home Is Where the Hearth Is: Narragansett Indian Houses and Homes on the Eve of European Contact*

Site RI 110 on the southern Rhode Island coast has yielded evidence of a large Narragansett Indian settlement occupied between AD 1000 and 1500. Archaeological investigations exposed more than 20 individual *wetus* (house sites) within an approximate 0.81 ha (2-acre) portion of the larger site. This paper will describe precontact Narragansett Indian house construction, intrasite house patterning, and variability in house size, shape, and the use of domestic space (home). The results provide new insights into Narragansett Indian life during the decades and centuries leading up to first European contact in the Narragansett Bay area in the sixteenth century.

**Wallis, Neill (Florida Museum of Natural History) and Thomas Pluckhahn (University of South Florida)**

**[137]**

*Understanding Multi-sited Woodland Communities of the American Southeast through Categorical Identities and Relational Connections*

While communities are often considered to be isomorphic with settlements, this equivalency is ill-suited to understanding contexts in which the structure of settlement and social organization was cyclical and nested at multiple spatial and temporal scales. In the coastal plain of the American Southeast, most Middle Woodland (ca. 500 CE) settlements comprised only a few households, but they were integrated by interactions and institutions that spanned many localities and included large civic-ceremonial centers. Overlapping communities included kin-based segments, non-kin institutions such as sodalities, and various regional affiliations.

These communities were constituted by shared identities, interconnected economies, integrative practices such as mound building and feasting, networks of regular social interaction, and associations with particular places. We investigate the intersections of communities at various scales by comparing categorical identities—affiliations proxied by the relative frequency of pottery surface treatments—with relational connections defined by face-to-face interactions between sites. The latter are evidenced by sourcing data and paddle matches on complicated stamped pottery that reveal earthenware vessels or carved wooden paddles were carried between sites. Using social network analysis we explore the spatial boundaries of distinctive categorical identities among sites and evaluate their correlation with the frequency and distance of evident relational connections.

Wallis, Neill [125] see Duke, C. Trevor  
Wallis, Neill [17] see Pavlovics, Victoria

**Wallman, Diane (University of South Florida), Mark Hauser (Northwestern University), Douglas Armstrong (Syracuse University) and Kenneth Kelly [147]**

*The Archaeology of Indigenous-European Interaction at LaSoye 2, Dominica, a Sixteenth- to Eighteenth-Century Trading Settlement*  
In 2017, storm surges from Hurricane Maria exposed evidence of an early European colonial settlement on the Caribbean island nation of Dominica. Subsequent survey and testing established the site as a trading settlement, dating from the sixteenth until eighteenth century, a period of dynamic change in the Caribbean. The site is located on the coastline of an active trading channel between Marie-Galant, Guadeloupe and Dominica, protected by a headland called Point La Soye. Behind this point is the first sheltered anchorage for vessels voyaging from Africa and Europe, and was the territory of indigenous Kalinago groups. Two seasons of archaeological testing at the site have recovered indigenous “Cayo,” and imported European ceramic wares, syncretic artifact forms, trade items, faunal remains, and more, indicating complex interactions between indigenous groups and the European traders. This site offers a rare opportunity to examine the consequences of informal European colonialism on the Caribbean frontier.

**Walls, Matthew (University of Calgary) and Mari Kleist (University of Calgary) [179]**

*Perspectives from a Digital Season and New Opportunities of Knowledge Co-production for Arctic Archaeology*  
Impact of the COVID-19 epidemic has been acute in the Arctic, where logistics and community collaborations are time sensitive. Having canceled our 2020 field season in Avanersuaq, Greenland, we decided to continue collaborative work online, while striving to bring Inughuit partners into the process of interpretation. In this paper, we present outcomes of our digital season. We discuss our workflow, how challenges of slow connections and limited data were addressed, and the method we developed to present and take input from community members in the Kalaallisut language. We are not yet satisfied our objectives are achieved in terms of new forms of coauthorship. However, through this work we have glimpsed new potential to challenge traditional modes of knowledge production. The separation of the field from the campus/museum can reinforce power relationships between archaeologists and Inuit communities when it comes to interpretation. Beyond presentation, digital media provides opportunity for communities to participate in interpretation once field crews return home. With archaeologists acquiring new fluencies in digital remote collaboration, we hope an unexpected outcome of the pandemic will be innovation in knowledge coproduction.

**Walshaw, Sarah and Eréndira Quintana Morales (University of California, Santa Cruz) [94]**

*Swahili Urban Foodways and Feasts: From Village to Town*  
Agropastoralists settled along eastern Africa's coast in the first millennium, bringing with them domesticated sorghum and millets, cattle and ovicaprids. The opportunities of the coastal environment led to marine resource exploitation and the adoption of rice and other foods introduced through Indian Ocean trade. Fish, rice, millets, and meats formed the dietary and economic bases that supported the rise of villages by the eighth century, and later large Muslim trading towns famed for connecting the Indian Ocean world to African interior riches. In this paper we compare regional patterning and chronological progression of urban foodways along the Swahili Coast. Agriculture, fishing, and herding supported everyday eating as well as special feast days implicated in the negotiation of power in growing towns. We begin with an early example from Pemba Island, examining late first millennium agricultural origins of the stone town of Chwaka. We then compare this to a rich assemblage of subsistence and culinary data emerging from Songo Mnara in the Kilwa archipelago, site of fourteenth-century bustling town life just prior to Portuguese disruption. Did Swahili town building change across time and space, and what can this tell us about the nature of settlement-subsistence relationships?

Walsh-Haney, Heather [38] see Elgart, Alison

Wandsnider, LuAnn [49] see Holdaway, Simon

**Wang, Li-Ying (University of Washington) [162]**  
*Discussant*

**Wang, Li-Ying (University of Washington) and Ben Marwick (University of Washington) [173]**  
*Bayesian Exponential Random Graph Modeling of an Iron Age Burial Network in Northeastern Taiwan*

Burials provide valuable information to study social structures and discuss social inequality. The relationship between prestige goods among burials may reflect the social relations between individuals, since prestige goods usually relate to social practices of trade, exchange, and gifting. We ask whether European colonial activities in seventeenth-century Taiwan resulted in the emergence of social inequality in an indigenous society. We use social network analysis (SNA) where burials represent actors (nodes in the network) linked by sharing the same prestige goods. Do the observed burial data indicate a more clustered network than a distribution of random networks with similar qualities? Exponential random graph models (ERGMs) are an important family of statistical models for analyzing network data and evaluating models of network structure. However, ERGMs are difficult to compute because their normalizing constant, which depends on model parameters, is intractable. A Bayesian framework allows for parameter inference using MCMC strategies that avoid the need for computationally intensive calculations of the normalizing constants. We use Bayesian SNA to study burials from Kiwulan, an Iron Age site in northeast Taiwan. This study helps to expand the use of burials in understanding the indirect effects of a colonial presence on indigenous groups.

Ward, Naomi [28] see Ricketts, Macy

**Warner, Jacob (Louisiana State University) and Aleksa Alaica (University of Toronto)**

[129]

*Contextualizing the Influence of Climate and Culture on Mollusk Collection: Donax obesulus Malacology from the Jequetepeque and Nepeña Valleys, Peru*

The influences of climate and human activity on archaeomalacological assemblages can be difficult to disentangle. We compare Early Horizon (EH; 800–200 BC) and Middle Horizon (MH; AD 600–1000) *Donax obesulus* size, age estimates, and paleoclimate data. *D. obesulus* is a short-lived (<5 years) intertidal clam common in archaeological and modern contexts along the coastline of Peru. Prehispanic anthropogenic pressures on the fishery and role of *D. obesulus* in ritual life are poorly understood. We estimate age of capture of *D. obesulus* specimens using a length-based Von Bertalanffy growth function to quantify the ubiquity of shell age, and compare both specimen size and age with % lithic flux, a proxy of El Niño frequency and strength, from a marine sediment core. The main pattern we observe is diachronic variation in *D. obesulus* size with larger shells during the EH and smaller shells during the later MH, alongside a decrease in % lithic flux (implying reduced El Niño event frequency). There is stasis in *D. obesulus* size during the MH through different occupational phases despite another reduction in % lithic flux. The data reveal that this bivalve collection may have been impacted by climate, seasonal, and cultural circumstances during these periods.

**Warner, Mark (University of Idaho)**

[156]

*Archaeology Is Anthropology, but Did Zooarchaeology Really Listen?*

The study of animal bones is an important contributor to many areas of archaeology, specifically in areas such as domestication, climate change, human/environment interactions, etc. However, when looking at the broader lens of anthropological theory as well as the burgeoning food studies movement, archaeology evidence is only infrequently part of those discussions. The argument put forward is that while zooarchaeology has contributed much to understandings of the past, the range of contributions is somewhat limited. The challenge moving forward as we continue to theorize food is to expand collective thinking so that zooarchaeology contributes in a more robust manner across the theoretical spectrum of anthropology.

Warnes, Andrew [156] see Chiou, Katherine

**Warren, Matthew (Historical Research Associates Inc.)**

[111]

*Provisioning an Embattled Frontier: The Role of the Inka Settlement of Pulquina Arriba within an Imperial Defensive Network in the Southeastern Bolivian Andes*

In certain loosely incorporated territories of the Inka Empire, privileged non-Inka colonial populations were granted considerable autonomy and entrusted with the maintenance of local imperial settlements and infrastructure. Such was the case across much of the southeastern Bolivian Andes, in which peoples transposed from highland valleys to the west were installed as retainers and protectors of a network of fortresses, roads, and way stations that lay along a frontier region with significant connections to the neighboring tropical lowlands. By the final decades of the empire, hostilities between the Inkas and the Guaraní-Chiriguano had transformed the region known as the *valles cruceños* from a promising nexus of trade and exchange into an embattled, fortified conflict zone. In this presentation, I will (1) discuss the settlement structure and sociopolitical organization of the Pulquina Arriba valley during the Late Horizon, highlighting the local distribution and functions of Inka-style material culture and architecture; (2) compare salient features of the local imperial landscape to those observed elsewhere in the southeastern Bolivian Andes; and (3) consider the spatial patterning of Late Horizon settlements at a regional scale with respect to the changing motivations of the Inkas and their allies in this violently contested borderland.

**Warwick, Tyler**

[121]

*Discussant*

**Watanabe, Shinya (Nanzan University, Japan)****[69]***Cultural Diversity and Its Implications: A Case Study from Middle Horizon Cajamarca, Northern Highlands of Peru*

In this paper, we will discuss the pottery typology and chronology of Cajamarca region to consider the cultural dynamics during the Middle Horizon period. We will present the excavation data from three archaeological sites: El Palacio, Paredones, and Terlén La Bomba. During the Middle Cajamarca Phase A (CE 600–750) the kaolinitic ceramic of Cajamarca presents intense uniformity, but during the Middle Cajamarca Phase B and C (CE 750–950) this pattern changes for a more diverse fine ceramics and mortuary patterns. In order to test our hypothesis, we will consider the following points: (1) the relation between cultural diversity and political system of Wari Empire, (2) the interaction between the Cajamarca region and the north coast of Peru, and (3) the genesis of new material culture. An example of this last point is the “Coastal Cajamarca” type pottery which appeared during the Middle Horizon and continued in the Late Intermediate period in Lambayeque region. This pottery type is an indicator of interaction, and our work will consider the background of its origin and distribution. This new style is distributed mainly along the Jequetepeque Valley. Finally, we will discuss the transition from the Middle Horizon to the Late Intermediate periods.

Watanabe, Takehiko [72] see Sato, Takao

**Waters, Albert (Independent Researcher), John Vandergugten (University of Toronto) and Gavin Donathan (Binghamton University)****[24]***A 3D Interactive Model of Spitzkloof D Rockshelter, Namaqualand, South Africa*

Archaeology is of great public interest, but a lack of approachable academic and popular materials may deter public engagement with our field and our research, meaning archaeologists must develop innovative means of communication. It is also vital that we make our work more accessible to local community members, whose history we are often excavating. Digital reproduction of archaeological sites through photogrammetry is a valuable documentative and educational tool that is easily accessible and engaging. We present photogrammetry results of the Spitzkloof D Rockshelter located in Namaqualand, South Africa, data for which was collected during the 2019 field season. Over 400 points were designated in and around the site, and their cartesian coordinates recorded using a Nikon Nivo 5M total station. The rockshelter was then photographed using a Sony a6400 camera, and the resulting images georectified using the program Agisoft Metashape. Using this information, we generated a 3D model of the rockshelter, the excavated units, and the immediate landscape. The ability to remotely view a relatively inaccessible site such as Spitzkloof D provides an opportunity to better present visual representations to the general public and local community members. Initiatives like these may be crucial in building and strengthening local relationships.

Waters, Jennifer [158] see Poister, Nicholas

**Watkins, Joe (Archaeological and Cultural Education Consultants)****[60]***Discussant***Watkins, Joe (Archaeological and Cultural Education Consultants)****[81]***Setting the Context of Equity and Harassment Issues: They Are NOT Only Women's Issues*

Social sciences within the United States, like US society in general, are facing serious ramifications regarding issues related to equality and harassment. Gender equity, pay equity, and funding equity are all part of the problems being faced by professionals employed in academic, public, and private sectors. Additionally, harassment in all forms—sexual harassment, gender harassment, and “bullying,” for example—is also encountered throughout the social sciences. As is to be expected, practitioners within the discipline of archaeology are reporting these same issues. No longer can archaeologists presume to adhere to codes of conduct that relate only to responsibilities to the past, but rather archaeologists must recognize their responsibilities to each other as well. This presentation outlines some actions that national and local social science organizations have undertaken in attempts to influence equity and harassment concerns as a means of setting the context for the session.

**[81]***Chair***Watkins, Tia (University College London), Jaime Awe (Northern Arizona University) and Claire Ebert (University of Pittsburgh)****[61]***Monumentality, Politics, and Power: Implications of Recent Investigations of Late Preclassic Public Architecture at Xunantunich, Belize*

The Late Preclassic period (~300 BC–AD 300) witnessed some of the most important changes in social and political roles in the Maya lowlands when an emergent elite class began to use art and architecture to publicly display their elevated status in society. Recent archaeological research at the hilltop center of Xunantunich, located in western Belize, have focused on creating a high-resolution chronology for the site's architectural development to further explore the periods leading up to the site's sudden peak in monumentality and socio-political power during the Late Classic period (~AD 750). During the 2018 field season, the Xunantunich Archaeology and Conservation Project, in collaboration with the Belize Valley Archaeological Reconnaissance Project, carried out stratigraphic excavations of Structure A7 in the Xunantunich site core to help fill in chronological gaps in the site's occupational history. Analysis of architectural construction phases at Structure A7, and results from AMS <sup>14</sup>C dating indicate previously



undocumented large-scale monumental construction by the Late Preclassic period. This presentation reports on the results of our 2018 investigations on Str. A7, and explores some of the earlier monumental construction episodes at Xunantunich during the Preclassic.

Watkins, Tia [25] see Ebert, Claire  
 Watkins, Tia [43] see Hoggarth, Julie  
 Watkins, Tia [23] see Saldaña, Gabriela

**Watling, Jennifer (University of São Paulo) and Morgan Schmidt (Massachusetts Institute of Technology)**

[66]

*Identifying Past Vegetation Dynamics in Xingu Indigenous Territory Using Soil Phytolith Analysis*

This paper presents the preliminary hypotheses of a soil sampling program aimed at mapping precolumbian and historic vegetation dynamics in the Xingu Indigenous Territory (TIX), Brazil. Research carried out with the Kuikuro during the last three decades has resulted in the archaeology of the TIX being one of the best studied and best mapped in Amazonia, but until now there have been no archaeobotanical or paleoecological studies aimed at identifying plant management within these highly complex cultural landscapes. By applying phytoliths, charcoal, and geochemical analyses to strategically placed soil transects that capture visible gradients of both modern (village > gardens > forest) and precolumbian (site > dark earths > unaltered soils) land use, we aim to contribute new data about vegetation, fire, and resource management regimes over the last 1,000 years.

Watling, Jennifer [66] see Schmidt, Morgan

Watson, Jessica [103] see Holly, Donald

**Watson, Sara (University of California, Davis) and Naomi Cleghorn (University of Texas, Arlington)**

[151]

*Technological Organization on the Paleo-Agulhas Plain: Robberg Lithic Technology from Knysna Eastern Heads Cave 1*

Lithic technological organization is based on the landscape-scale distribution and availability of resources. During the Last Glacial Maximum (LGM), the landscape off the southern coast of South Africa was a different world than it is today. At its most extreme, the modern-day coastline was up to 75 km from its present position. The exposed continental shelf, known as the Paleo-Agulhas Plain, provided an important resource for prehistoric people that is dramatically different from contemporary conditions. The Robberg technocomplex (~20–12 ka) is known from cave and rockshelter assemblages across southern Africa but sites from the southern coast are rare, limiting our understanding of how landscape-scale changes in resource availability affect technological decision making during the LGM. Here we present preliminary results for lithic assemblages assigned to the Robberg technocomplex from the site of Knysna Eastern Heads Cave 1 (KEH-1), located on the modern-day southern coast. We describe raw material selection and acquisition, methods, and techniques used in flake production; the role of heat treatment; and decisions of lithic provisioning and transport. We examine temporal changes within the KEH-1 sequence and situate the assemblages within the broader context of the Robberg technocomplex.

Watson, Valerie [153] see Mills, Rebekah

**Wattenmaker, Patricia (University of Virginia)**

[78]

*Urban Ideologies and Demographic Revolutions in Ancient Mesopotamia*

Dramatic demographic growth is a hallmark of the urban process, yet reasons for population growth in emerging urban systems are not well understood. This paper draws on archaeological and textual evidence pertaining to ideology of the house and cultural values to explore why populations increased so dramatically in third millennium Mesopotamia. Additional consideration of some of the limiting factors in population growth helps provide insight into the complex relationships among population growth, prestige building, and inequalities in some early urban societies of Southwest Asia.

**Watts, Corinne**

[96]

*Determining the Biographies of the Indonesian Standing Stones at Harvest Preserve, Iowa City, Iowa*

There are numerous megaliths on the islands of Indonesia, including the island of Flores where their constructions date to 2500–1000 BCE. Some of the stones that comprise these megaliths have been trafficked to other countries in recent years. In the early 2000s an Iowa City collector purchased a set of 50 of these standing stones from a location or locations in Indonesia and placed them in two stone arrangements, known as Sacred Stone Circle and Relationships, at the Harvest Preserve in Iowa City, Iowa. These stones have never been the subject of archaeological or geological investigations, and their precise origins and biographies remain unclear. This project uses portable X-ray fluorescence to establish the geochemical composition and possible provenance of these megalithic stones, and specifically attempts to verify whether these stones originated from outcrops in Flores.

**Watts, Joshua (Archaeology Southwest)**

[49]

*CyberSW: A Preservation Archaeology Approach to a Web-based Southwest Regional Database*

CyberSW (NSF Award # 1738062), is a web-based science gateway built to facilitate research on the regional- and landscape-scale archaeology of the southwest United States and northwest Mexico (<https://cybersw.org/>). The data—focused on sites, ceramics, obsidian, rock art, and public architecture—are collected from a wide variety of legacy and contemporary sources and adapted to fit the data model of cyberSW so that researchers can query the data and conduct analyses without having to build their own ontologies. Topics such as prehistoric demography, migration, and social networks are particularly well suited to this large but cohesive research database. While the artifact data from sites are available to registered users, sensitive information such as site locations remains masked. The database underlying cyberSW is built on the innovative graph database platform Neo4j. In addition to new projects, cyberSW aggregates data from the Coalescent Communities Database, the Southwest Social Networks database, and the Chaco Social Networks database. CyberSW is maintained by Archaeology Southwest, extending the broader ethic of Preservation Archaeology to the data generated during archaeological field and lab work—much of it from cultural resource management projects—to advance science, education, and partnership with Indigenous communities.

Watts Malouchos, Elizabeth [52] see Friberg, Christina

**Wayman, Joseph (Independent Researcher)**

[142]

*LCT Movement due to Animal Locomotion: Model Experiments in a Trail Box*

Experiments were performed using a scale model animal footstep simulator and similarly scaled lithic LCTs (Long Cutting/Core Tools) to test the hypothesis that the devices were manufactured for the purpose of being deployed in the path of target animals to damage their feet and make them easier to kill and use as a resource (Wayman 2010).

**Weaver, Brendan (Stanford University), Lizette Muñoz (University of Pittsburgh) and Karen Durand (Uywa ZooLab)**

[115]

*From Slavery to Servitude: Approaching Hacienda Worker Health through Transformations in Labor and Foodways in Nineteenth-Century South Coastal Peru*

The nineteenth century was a dynamic period for hacienda workers on the south coast of Peru. Once Jesuit vineyards with two of the largest enslaved Afro-descended populations in rural coastal Peru, the haciendas of San José and San Javier and their annexes in Nasca's Ingenio Valley underwent dramatic changes with the replacement of their grapevines with cotton, and the introduction of new types of workers. Cantonese indentured workers were contracted beginning in the 1830s, and 1855 brought legal emancipation to the majority enslaved workforce. Seasonally, highland Andean workers joined the demographically shifting permanent hacienda population. This paper uses evidence from excavated midden contexts at San Javier, San José, and San José's annex of Hacienda La Ventilla to explore these changing agroindustrial dynamics and worker health through the lenses of labor and foodways.

**Weaver, Brendan (Stanford University)**

[186]

*Discussant*

Webb, Elizabeth [136] see Emery, Kitty

**Weber, Sadie (Harvard University) and Percy García (Universidad Nacional Pedro Ruiz Gallo de Lambayeque)**

[69]

*Wealth on the Hoof: Cajamarca Culture Camelid Pastoralism*

Located in the Cajamarca Valley, the site of Iscoconga (50 BCE–750 CE) represents one of the few extensively explored domestic contexts of the Cajamarca Archaeological Culture. Excavations at Iscoconga revealed, among many things, that the economic base of the Cajamarca peoples was diverse. While the Cajamarca peoples are known for their striking kaolinic ceramics, camelid pastoralism was an important contributor to the Cajamarca domestic and, perhaps, commercial economies. Today, animal husbandry in Cajamarca is centered on cattle rearing, but alpacas were recently reintroduced to the region as a means of improving economic stability for smallholders. In this paper, we present the results of the analysis of faunal remains from the Iscoconga site. We propose that the people living at Iscoconga raised animals for both fleece and transport, which aided the Cajamarca peoples in the exchange of local and nonlocal products as well as the maintenance of their economic and ethnic autonomy in this region and beyond.

**Webster, Chris (Archaeology Podcast Network [DIGTECH LLC])**

[73]

*Discussant*

**Webster, Laurie (University of Arizona)**

[139]

*Snakeskin and Corn Markings: The Dotted-Diamond-Grid Pattern in the US Southwest*

The dotted-diamond-grid pattern first appears on the textiles and pottery of the southwestern United States in the mid-AD 1000s or early AD 1100s. Fifteenth-century kiva murals from the northern Southwest confirm the importance of this design system for decorating ceremonial cloth prior to Spanish contact. In this paper we use evidence from textiles, ceramics, rock art, and other media to explore the spread of the dotted-diamond-grid pattern into the Southwest, from its ancient Middle American roots based on

reptiles, water, maize agriculture, and fertility, to its incorporation into southwestern ideologies and persistence in ritual practice.

Weetaluktuk, Tommy [148] see Ryan, Karen

Wegmann, Karl [95] see Holcomb, Justin

## **Weik, Terrance**

[60]

*Discussant*

## **Weik, Terrance**

[186]

*Cattle Colonialism: A Comparative Perspective on Chickasaw Territory and Latin America*

Indigenous and enslaved people's increasing global encounters with cattle in the nineteenth century present unique vantage points from which to understand the diversity of engagements that constituted and created capitalism, settler-colonialism, and Afro-Indigenous Landscapes. The archaeology of Levi Colbert's Prairie (LCP), in the Chickasaw territory of the US Southeast, and Latin American cattle ranching are examined to explore African (Diasporan), Indigenous, and European culturally specific and entangled social practices and experiences that facilitated exchange and interaction. As ever-expanding cattle ranching in the western hemisphere began in Latin America, a comparative perspective is a useful aspect of a logistical model of pastoral capitalism at LCP. The goal is to develop a better understanding of emergent cattle colonialism. Archival sources such as maps and head counts (human or bovine) are fruitful forms of evidence that, along with artifacts, animal bones, and other forms of data, lend themselves to complementary and unique lines of inquiry. The resulting research can make valuable contributions to our understanding of the economics of landscape practices, the lacunae in nineteenth-century Chickasaw settlement strategies, the nature of agrarian materiality, and the relationships between people and embodiments of the earth.

Weinberg, Camille [128] see Espino Huaman, Richard

Weinberg, Camille [128] see Larios, Jennifer

Weinberg, Camille [128] see Osborn, Jo

**Weisler, Marshall (University of Queensland), Quan Hua (Australian Nuclear Science and Technology Organisation), Jianxin Zhao (University of Queensland), Hiroya Yamano (National Institute for Environmental Studies) and Ai Du Nguyen (University of Queensland)**

[83]

*Determining the Chronology of Reef Island Development for Constraining Initial Human Colonization of Pacific Atolls*

As recent worldwide news coverage has aptly reported, Pacific coral atolls are the most precarious landscapes for human settlement, yet many of them evidence continuous occupation for 2,000 years. Coral atolls are unique in their small size, low elevation, limited diversity of terrestrial flora and fauna, poorly developed and unconsolidated soils, and absence of surface potable water—all characteristics that constrain human settlement. Indeed, global warming has accelerated sea level rise that is altering shorelines, eroding archaeological sites, and inundating modern villages and gardening zones. Consequently, how did small human founding groups survive over the millennia and, in a sense, flourish on these most challenging of Pacific landscapes? Our multidisciplinary research utilizes information from archaeology, island emergence and development, and sea level rise to understand human colonization and adaptation to Pacific low-lying coral atolls. Atoll emergence constrains the earliest time possible for human colonization—the dating of which is fundamental for addressing the tempo of economic and social change and for charting population growth. Using dated samples from habitation layers and paleo-sea level indicators, we reconstructed sea level history, island emergence, and facies development for constraining the period of initial human colonization at Ebon Atoll, southern Marshall Islands, eastern Micronesia.

**Weiss, Elizabeth (San Jose State University) and James Springer**

[88]

*Has Creationism Crept Back into Archaeology?*

Archaeologists and anthropologists have been at the forefront of supporting the spread of science over creationism religion. For instance, the Society for American Archaeology posts teaching guidelines that includes statements that dinosaurs went extinct 65 million years ago, the Americas were inhabited about 12,000 years ago, and that archaeology follows the scientific process. The American Anthropological Association, on their policy page, states that "Evolution is a basic component of many aspects of anthropology (including physical anthropology, archeology...)." And, the American Association of Physical Anthropologists has an anti-creationist statement in which it "condemns any effort by the state to dictate specific religious instruction to the people." However, archaeologists and anthropologists have nearly unanimously supported the Native American Graves Protection and Repatriation Act (NAGPRA). NAGPRA violates the First Amendment in multiple ways; for instance, "traditional" religious leaders are required for the review committee, "traditional" prayers open and close NAGPRA meetings, and decisions to repatriate remains are made on the basis of creation stories. With NAGPRA, archaeology has become entangled with religion in a way that would never be accepted if the religion was Western-based. We propose a different perspective on human remains and artifacts based on objective knowledge rather than creationism.

**Weitzel, Elic (University of Connecticut)**

[73]

*Discussant*

**Welch, Jacob (Yale University)**

[59]

*Place-Making and Elite Maya Identity at Ucanha, Yucatán, Mexico*

During the Late Classic period, ancient excavators at an elite residence at Ucanha, Yucatán, Mexico, broke through several stucco floors and peeled away rocky fill before partially exposing two earlier buildings dating back to the Late Preclassic. Centuries separated the initial burial of these Preclassic buildings and their subsequent excavation in the Late Classic, indicating that Ucanha's leaders passed down the precise locations of the buried architecture over several generations. This paper explores (1) why elites invested considerable effort to expose the earlier construction phases, (2) why the Late Classic afforded the opportune historical moment to carry out excavations within their residence, (3) how engaging with ancestral buildings connected Late Classic leaders with earlier histories at Ucanha, and (4) how exposing earlier building episodes redefined their Late Classic place of residence. I argue that Ucanha's Late Classic leaders used the excavations to assert ancestral links to their predecessors and the Preclassic buildings they used. By lengthening the temporal fabric of their place of residence, Late Classic leaders could anchor their authority to a distant, localized past.

Welch, John [81] see Hodgetts, Lisa

**Welker, Martin (Arizona State Museum) and Eréndira Quintana Morales (University of California, Santa Cruz)**

[129]

*Meta-analysis of the North Atlantic Cod Fisheries: The Zooarchaeology of the Sixteenth- to Nineteenth-Century Transatlantic Cod Trade*

The distribution and abundance of animal populations have significantly impacted human settlement decisions, mobility, economics, and conflict throughout history. The abundance of cod (*Gadus morhua*) in North Atlantic fisheries enticed English, French, and Basque fishermen to the region to catch, salt, and export cod to Europe. Efforts to monopolize economically important cod fisheries in the region led to repeated military conflicts between major European powers. Despite this, the archaeological record of the cod trade in North America and archaeological evidence for the trade of cod from the North Atlantic to other North American and European ports have not been widely studied. Our study focuses on zooarchaeological evidence from the sixteenth through nineteenth centuries. We show that though cod remains are abundant in the regions where they were caught and processed, they show up only infrequently in other North American assemblages. Furthermore, though North Atlantic cod have been previously identified in European assemblages, they are found primarily in regions where cod had been or were still available. These results contribute to our understanding of cod's important economic role in the development of North American trading ports and reveal transatlantic connections in post-medieval Europe.

**Wellman, Hannah (University of Oregon), Megan Spitzer (National Museum of Natural History) and Torben Rick (National Museum of Natural History)**

[91]

*Archaeology and Ethnobiology of Late Holocene Bird Remains from the Northern Oregon Coast*

Archaeological bird remains from the Oregon coast have recently received renewed attention. We contribute to this discussion with an analysis of bird remains from the Late Holocene Par-Tee site (35CLT20) in Seaside, Oregon. We sampled the Par-Tee avifaunal assemblage to near-redundancy and generated the largest sample from a single site on the Oregon Coast to date (N = 7,204). Our results support previous Oregon coast avifaunal assemblage analyses. The Par-Tee assemblage is dominated by near shore or estuarine birds including scoters, alcids, and shearwaters. There are also small amounts of unique species such as the California condor (*Gymnogypus californianus*) and the short-tailed albatross (*Phoebastria albatrus*), both of which are currently endangered and face conservation challenges. The Par-Tee avifaunal assemblage is diverse, but people at the site focused on acquiring the most accessible species in the near shore habitat. Our study of the Par-Tee bird remains helps clarify the nature of past human-bird interactions in coastal Oregon, emphasizes the importance of sample size in documenting species of conservation concern that may be rare in the archaeological record, and illustrates the value of zooarchaeological studies of archaeological legacy collections.

**Wells, Joshua (Indiana University, South Bend), Mackenzie Edmonds (Indiana University, South Bend), David Anderson (University of Tennessee, Knoxville), Eric Kansa (Open Context) and Sarah Kansa (Alexandria Archive Institute)**

[10]

*Linking Convergence between Compliance and Research Archaeology through Linked Open Data Strategies in the Digital Index of North American Archaeology*

The Digital Index of North American Archaeology (DINAA) is a linked open data hub situated to help illuminate theoretical and practical connections between compliance archaeology and broader realms of archaeological science and public knowledge. This poster provides an assessment of prevalence of compliance activity represented in the approximately one million archaeological sites registered with DINAA. Areas of dense compliance activity are then compared against topic models for those areas built from the DINAA Linking Sites and Literature module, which contains citation information for journal articles, gray literature reports, and Federal Register communications. Using these two vectors of information focused on geographical areas of interest (density of compliance activity and topical foci in heritage research and preservation) we suggest compelling issues on which compliance firms and practitioners may converge with one another and with colleagues in other sectors to create data interoperability based upon integration of shared goals as reflected in intermingled concepts. Because DINAA is a completely free and open-source (CC BY and

CC 0) information project, we further define practical ways that DINAA resources and other free and open-source toolkits may be leveraged by professional communities seeking to create ethically, financially, and reproducibly sustainable processes of convergence.

**Wells, Joshua (Indiana University, South Bend)**

**[160]**

*Discussant*

**Weyrich, Laura (University of Adelaide), Raphael Eisenhofer (University of Adelaide), Bastien Llamas (University of Adelaide), Keith Dobney (University of Sydney) and Scott Fitzpatrick (University of Oregon)**

**[83]**

*Utilizing Ancient Oral Microbes to Track Human Migrations across the Pacific Islands: Insights from Palau and Beyond*

Ancient human migrations underpin the origin of past cultures, health, ecological interactions, and identity. However, recent or rapid migrations are difficult to track using classical demographic tools that monitor human genetic mutations over time. A new method—tracking human migrations by assessing microbial genome evolution over time within calcified dental plaque—provides a unique solution to this problem. Here, we sequenced ancient DNA preserved within calcified dental plaque from more than 150 ancient individuals spread throughout the Pacific Islands from Micronesia to Polynesia. We explore the oral microbial communities in four different Pacific Island Nations, revealing unique insights into microbiota adaptation to specific environments. We also use a phylogenomic approach to reconstruct the evolutionary history of 10 different vertically inherited oral microbes preserved across all individuals to investigate past movements throughout the Pacific. Specifically, a key oral species within the Anaerolineaceae family improves resolution provided by past human ancient DNA studies and provides exciting new insights into the settlement of the Pacific Islands, especially Palau. Overall, this study highlights how ancient human-associated microbes can offer key demographic and cultural insights, revealing this method as a minimally invasive method to identify past cultures and potentially repatriate human remains.

Wharton, Jeffery [100] see Stephens Reed, Lori

**Wheelbarger, Linda (San Juan College)**

**[117]**

*Chacoan Trade, Interaction, and Influence at Point Pueblo in the Middle San Juan Region of Northwestern New Mexico*

San Juan College field school sessions and volunteer work have been conducted over the past 15 years at Point Pueblo on the B-Square Ranch where a multistory D-shaped great house is associated with a great kiva. This is one of several Chacoan communities in the Middle San Juan region of northwestern New Mexico and artifacts there indicate interaction with other communities to the south and west. The great kiva was initially the focus of excavation while recent work has concentrated on the great house that has so far revealed an arc of 12–15 rooms, blocked-in kiva, and 10–12 large rooms, some of which are multistory. Several rooms provided evidence of burned *latillas* between the upper and lower story rooms. Room 34 contained a particularly large quantity of ceramics, animal bone, lithics, and exotic items. Previous analyses have provided information that Point Pueblo ceramics are predominantly local in origin but also include quantities of tradewares from the south and west. The goal of this analysis is to assess the extent of Chacoan trade, interaction, and influence at Point Pueblo by reviewing ceramic types revealed during these excavations from the great kiva, great house, and other areas of the site.

Wheelbarger, Linda [140] see Rospopo, Steven

Whelan, Carly [38] see DeGeorgey, Alex

Whetstone, Tanner [39] see Hall, Mark

**Whisenhunt, Mary (University of Texas, San Antonio), John Roney (Colinas Cultural Resource Consulting), Robert Hard (University of Texas, San Antonio), Lori Barkwill Love (University of Texas, San Antonio) and Toni Laumbach (Human Systems Research Inc.)**

**[37]**

*Living on the Mimbres Western Edge: Regional Affiliation in Arizona's Upper Gila River Valley AD 750–1300*

Data derived from archaeological survey and local informant knowledge in southeastern Arizona's York-Duncan Valley provides new insights into regional affiliations and potentially the identity of those living on the far western edge of the Mimbres region. From 2014 to 2020, University of Texas at San Antonio field school participants and Colinas Cultural Resource Consulting partnered to survey and work with the local community to record nearly 80 prehistoric and historic sites. Site surface assemblages in the research area represent the entire sequence of Mimbres-Mogollon ceramic types, suggesting valley communities established enduring internal social relationships and long-term continuity of occupation. Decorated pottery designs and types, and the presence of nonlocal ceramics and exotic trade materials, reveal distinct relationships with external groups and suggest an identity both similar to and different from those living in the Mimbres Valley. Analysis of a recently acquired collection of whole pot photos acquired from a local informant offers additional insights into the York-Duncan Valley's cultural diversity and interregional relationships.

**White, Chantel (University of Pennsylvania), Michael Wallace (University of Sheffield), Angela Lamb (NERC Isotope Geosciences Laboratory) and Meredith Chesson (University of Notre Dame)**

**[94]**

*Early Bronze Age Economies along the Dead Sea, Jordan: Reconstructing Agricultural Practices through Integrated Stable Isotope Analysis and Macrobotanical Study*

Archaeologists such as Chesson (2019) have suggested the need for a more nuanced characterization of Early Bronze Age urbanism in the Southern Levant, one that embraces local variations as part of a regional EBA ideological package. Local agricultural economies would have included diverse techniques and scales of crop husbandry strategies performed at the community and/or household levels. This paper investigates agricultural evidence from the EBIII site of Numayra (ca. 2850–2550 cal BC) in Jordan using the combined approach of stable isotope analysis and macrobotanical study to assess investments in cereal cultivation over time and between household clusters. Several primary crop storage deposits containing carbonized barley and emmer wheat grains were sampled from residential spaces at Numayra to determine whether households may have had varying access to favorable arable land and water resources. Stable isotope analysis has revealed that the crops stored within some of the storage features were better watered than others, and that barley was selectively grown in drier fields than wheat. This work provides some insight into how a small grouping of households may have negotiated access to local agricultural resources as part of their experience residing in a fortified EBIII community along the Dead Sea.

**White, Jeffrey (Owner/Operator)**

**[109]**

*Digging for Community Engagement*

Community engagement in anthropology and archaeology is extremely important in this day and age, just as it has been in the past; through community engagement, we have the ability to pass along the importance of conserving and preserving our shared (?) archaeological heritage as well as pointing out the importance of every human being's ethnicity, culture, and heritage. It is imperative that this discipline strives to reach out to youth in an effort to diversify, grow, and ultimately improve an already awe-inspiring, adventurous field of study. Through my mobile youth outreach program "Archaeology, Can You Dig It?" I am able to reach thousands of aspiring young archaeologists through engaging, educational, inspiring, authentic, hands-on anthropology/archaeology programs. These activities provide an understanding of what it entails to be an anthropologist/archaeologist and, optimistically, will steer some young participants into this career path. My program also offers an opportunity to engage the adult public in efforts to provide them with a better understanding of what we actually do in the field and lab. I think that archaeology and community engagement complement each other and the field widely benefits when the two collide.

**White, John (Center for the Study of the First Americans), Ted Goebel (Center for the Study of the First Americans), Aureade Henry (National Center for Scientific Research, Nice, France), Stephen Kuehn (Concord University) and Lyndsay DiPietro (Baylor University)**

**[52]**

*Results from Test Excavations of NAB-00533: Apparent Nenana-Aged Occupation from the Northern Copper River Basin*

NAB-533 is a buried multi-component prehistoric site located in the northern Copper River Basin. National Park Service archaeologists engaged in compliance testing originally recorded the site in 2016. During the 2017 and 2018 field seasons NPS Archaeologist Lee Reininghaus led a project to conduct test excavations at NAB-533. These excavations revealed a feature interpreted as a fire hearth and dated to 11,324–12,188 calendar years ago. In 2019 a team from the Center for the Study of the First Americans at Texas A&M University initiated test excavations to establish the stratigraphic context of the artifacts and cultural features, collect geoarchaeological samples, obtain additional radiocarbon dates, and increase the sample of artifacts. We excavated 4.75 m<sup>2</sup>, stratigraphically identifying multiple cultural components. Here we present the results of our analyses which may prove highly significant. Data from this site have the potential to shed light on the processes involved in the initial peopling of Alaska, and more broadly of the American dual continent. We present these results in the hope that they contribute to the ongoing debate which seeks to expand our understanding of the First Americans and the earliest inhabitants of Alaska.

**White, Joyce (University of Pennsylvania Museum), Bounheuang Bouasisenpaseuth (National Museum, Laos), Helen Lewis (University College, Dublin), Michael Griffiths (William Patterson University) and Kathleen Johnson (University of California, Irvine)**

**[150]**

*Middle Mekong Archaeological Project: Overview and New Data*

The Middle Mekong Archaeological Project (MMAP) is a collaborative venture developed between Joyce White and Bounheuang Bouasisenpaseuth and other researchers working to develop an archaeological research program with the Lao Department of Heritage, with a primary focus on the prehistory of the Luang Prabang area. This paper gives an overview of the research program and discusses recent significant results for regional prehistory. Speleothem evidence for a middle Holocene megadrought lasting over a millennium reshapes how that period can be interpreted by archaeologists investigating interior mainland Southeast Asia. In addition, new radiocarbon dating evidence from the Tham An Mah rockshelter, which has shown features with unmistakable relationships to the Plain of Jars, suggests that the megalithic tradition existed into the early historic period, postdating its previously assumed Iron Age period attribution.

**White, Loren (Oregon State University)**

**[95]**

*Geoarchaeological Insights from a Late Pleistocene–Terminal Holocene Site on Isla Cedros, Baja California*

Current geoarchaeological investigations of the Cerro Pedrogoso (Rocky Hill) site on Isla Cedros, Baja California, seek to provide a context for a Late Pleistocene and Early Holocene human occupation along the Pacific coast. Here, a rich assemblage of artifacts

signals the presence of maritime coastal adaptations from at least 12.6 cal ka. A series of stratigraphic exposures and seven archaeological excavation units reveal the local geomorphic history and repeated cultural occupations. Intact deposits were characterized, dated, and correlated for lithostratigraphic and pedologic continuities. Topography and lithofacies were mapped with a laser transit to display excavation units and stratigraphy in three dimensions. A regional interplay of tectonic and hydrologic factors controls the discharge of nearby freshwater springs that likely had a singular influence on the locus of cultural activities here. I hypothesize a model of combined aeolian and alluvial fan deposition during the Late Pleistocene and Early Holocene epochs with subsequent landform incision and stability. Soil and climate geomorphic factors were also considered to further assess this site's formation and taphonomy. Identifying paleoclimatic influences on Cerro Pedrogoso's situation in the larger landscape may be generally instructive toward understanding cyclical landform evolution on the Baja peninsula at the Pleistocene-Holocene transition.

**White, Sean (University of Colorado, Boulder)**

[37]

*The Pithouse to Pueblo Transition, Mealing Facilities, and the Mogollon Mimbres Society*

Mealing facilities include the tools (metates, manos), features (bins), and architecture (kivas, pueblo rooms) used in the process of grinding corn kernels and other materials at an archaeological site. The goal of this poster is to classify, catalog, and compare the properties of mealing facilities in the Mogollon Mimbres region from before and after the pithouse to pueblo transition to understand how their use changed. Using site reports from excavations dating to these two periods, I will create a database of mealing facilities to consider their characteristics, including room size, number of mealing bins, types of associated artifacts, and evidence for wear on the artifacts themselves. This research speaks to gender relationships in society, due to ethnographic evidence that mainly women used mealing facilities. The pithouse to pueblo transition was a major regional change in the prehispanic Southwest. By examining mealing facilities before and after this transition, we can not only improve our understanding of the changes in food processing but also learn more about the dynamic position of women within society in the Mogollon Mimbres region.

**Whitehead, William (SWCA Environmental Consultants)**

[10]

*Recent UAV Data Collection and Integration with Traditional Archaeological Methodologies*

UAV data collection has become increasingly common in North American archaeology. This presentation will give an overview of the state of the art in UAV data collection, technologies, and processing methodologies. All fronts in UAV data collection are progressing at an ever increasing pace, making staying up-to-date almost impossible for most archaeologists. Aircraft, payloads, software, and mapping techniques have made it even easier for UAV technology to be integrated into all aspects of fieldwork. Examples of landscape mapping, intensive site mapping, and terrain analysis will be given, with the methodologies recommended to repeat the results.

**Whitley, David (ASM Affiliates Inc.)**

[53]

*Ethnography of Salinan Rock Art*

The Salinan Tribe occupied territory extending from the California's Salinas Valley across the Santa Lucia/Central Coast Ranges to the Pacific coast. Although poorly known, they created a small but important corpus of rock paintings. Even less well-known is the ethnographic record on these pictographs. This includes a comment by Junipero Serra written in 1773, representing the earliest Euro-American mention of Native Californian rock art. Additional ethnographic sources suggest parallels in origin and meaning with the better-described Yokuts rock art located in the Sierra Nevada to the east. Oral history suggests that one rock art site, CA-MNT-316, was used for boys' puberty initiations as late as 1916, again suggesting similarities with Yokuts ethnography. A possible written inscription at this site may support this use for religious purposes. The inclusion of the Salinan ethnographic information amplifies our understanding of the origin and meaning of Native Californian rock art, and the extent of the South-Central California rock art tradition.

[53]

*Chair*

**Whitley, David (ASM Affiliates Inc.)**

[90]

*Discussant*

**Whitridge, Peter (Memorial University of Newfoundland) and James Williamson (Memorial University of Newfoundland)**

[179]

*The Use of Aerial Drones to Map, Monitor, and Analyze Inuit Sites in Northern Labrador*

A photogrammetric revolution has occurred in archaeology with the appearance of software that allows objects, features, sites, and landscapes to be finely rendered as automatically stitched photomosaics and navigable 3D models. The simultaneous emergence of reasonably priced remotely piloted aircraft (RPAs, or drones) that can produce suitably high-resolution photographs has been particularly transformative in the North, where thin ground cover exposes archaeological traces, and much of which falls outside of the restricted airspace that constrains drone operations in built-up areas. Since 2016 archaeologists from Memorial University have employed a variety of drones to map Inuit and other sites in northern Labrador, generating large photographic datasets that precisely record surface features within their landscape setting. The research possibilities of drone imagery are illustrated with a case study from the precontact and early historic Inuit winter village of Kivalekh where experimental analyses of the RPA datasets, including green-band manipulation in sequential imagery, have yielded promising results.

Whittaker, Scott [170] see Porter, Joshua

**Wholey, Heather (West Chester University), Daria Nikitina (West Chester University) and Katherine Dowling (West Chester University)**

[35]

*Prioritizing Site Loss in the Delaware Bay, USA, Using Probabilistic Modeling*

The Delaware Bay is the second largest estuary along the US Atlantic coast and is experiencing some of the gravest effects from climate-driven sea level rise along the East Coast. Certain areas along the bay have the lowest mean elevation in the USA and are experiencing both accelerated sea level rise and coastal subsidence. Coastal sites are often at an elevation of 1 m or less and subject to daily tidal action, storm surge, and long-term inundation. The archaeological heritage of the region encompasses diverse occupations by Dutch, Finns, American Indians, and Africans, and is represented by iconic cultural landmarks such as Native American villages, seventeenth-century Dutch settlements, nineteenth-century resort towns, and World War II defensive installations. We propose that the projected impacts to known and potential archaeological resources and should be modeled using probabilistic sea level projections (Kopp et. al 2016) based on the Representative Concentration Pathway 8.5 gas emission scenario (IPCC A5) that accounts for atmospheric carbon concentration and incorporates regional processes influencing relative sea level rise. Results can yield localized and even site-specific decadal inundation projections up to 2100 that we demonstrate provide a useful prioritization and planning tool for known and potential archaeological resources.

[35]

*Chair*

**Wholey, Heather (West Chester University)**

[113]

*Discussant*

**Whyte, Rachel (University of Central Florida), Michael Callaghan (University of Central Florida) and Brigitte Kovacevich (University of Central Florida)**

[2]

*Working toward a Lost Cause? Comparing Handheld XRF Analysis to Neutron Activation Analysis and Petrography Using Maya Ceramics from Holtun, Guatemala*

Recent research has demonstrated that handheld (portable) X-ray fluorescence spectrometers (pXRF) have difficulty in consistently and accurately determining chemical composition of non-homogenous cultural materials such as ceramics. This is unfortunate as pXRF instruments have proven to produce accurate and consistent compositional data for other archaeological materials like obsidian and metal. They are also known for being a nondestructive way to test chemical composition, maintaining the artifacts integrity; saving time, money, and solving issues related to the transportation of artifacts. While pXRF instruments do not always perform as well as conventional methods, such as neutron activation analysis (NAA), bench-top XRF, and laser ablation-inductively coupled plasma-mass spectrometry (LA-ICP-MS), they still allow archaeologists to identify other patterns related to composition. In this paper I report on the chemical compositional patterns generated through handheld XRF study of ceramic sherds from the Maya site of Holtun, Guatemala. These sherds have been previously run with NAA and subject to petrographic analysis. I compare the pXRF data for ceramic pastes with the NAA and petrographic data to further test limitations of pXRF on archaeological ceramic pastes, and to identify any patterns unique to pXRF analysis.

**Wibberly, Alaina (Bureau of Land Management, Barstow Field Office)**

[54]

*Modeling the Mojave: Old Data, New Futures, and the Semiotics of Empty Space*

The settler colonial history of the Mojave Desert may be defined less by its expansion and more by its various failures and withdrawals. Drawing on a dataset of historic refuse sites that spans two centuries and three million acres, this paper uses spatial modeling to map the landscape's trajectory toward waste-land. The trash dumps and mining ruins that dominate the material record testify to cycles of extraction, exhaustion, and abandonment as settlers struggled to find value in the United States' driest desert. These colonial histories preface an equally colonial present in which the value of the Mojave lies in its value-lessness: hazardous waste dumping, extractive industry, and military test ranges put the desert's "empty space" to use. Might the archaeological record be used to challenge the inevitability of such a future, which threatens both Indigenous sovereignty and the landscape's ecological survival? Statistical modeling, as a tool that embraces linear progress, can be applied critically to the progress-oriented history of colonial expansion as a representational method whose slippages reveal alternate futures. Embracing GIS modeling as speculative archaeology, this paper attempts to unwind the trajectory of settler logic and challenge the myth of "empty space" in the colonial encounter.

**Wichlacz, Caitlin (Arizona State University)**

[74]

*2D Geometric Morphometric Analysis of Ceramic Vessel Profiles from Phoenix Basin Hohokam Sites*

This work tests the feasibility of using 2D geometric morphometric analyses of archival vessel profiles to reevaluate vessel form classifications from Pueblo Grande in order to aid in asking new questions of the dataset. Two-dimensional profile drawings of whole and reconstructible ceramic vessels were routinely made during archaeological projects in the Phoenix Basin in recent decades, creating a valuable archive of 2D shape information. Archaeologists working at Pueblo Grande in the early 1990s recovered, documented, and analyzed over 2,000 whole and reconstructible vessels, giving substantial attention to considerations of vessel morphology. The overwhelming majority of these whole and reconstructible vessels were recovered from mortuary contexts and



have since been repatriated, precluding additional analysis of the original objects. In addition, standard classifications and analyses of vessel forms pose challenges for addressing new questions with existing data. Because of the large amount of additional data recorded for these vessels during the Pueblo Grande project, relationships between vessel shape and numerous other characteristics can be tested and compared to existing models of ceramic production and exchange for the area. A smaller collection of archival vessel profiles from the site of Las Colinas is similarly evaluated and compared.

Wiedenmeyer, Emilie [32] see Friend, Sadie

**Wiewel, Adam**

[52]

*Twenty-First-Century Archaeological Geophysics in the National Park Service*

The Midwest Archeological Center (National Park Service) has long been at the forefront of geophysical surveys for archaeological research and heritage management in the United States. Since the Center's pioneering efforts to showcase the practicality of geophysical methods nearly 50 years ago, our use of ground-based surveys has become indispensable for documenting, understanding, and preserving archaeological resources. I will discuss significant findings from recent projects to illustrate how geophysical surveys facilitate communication with our partners and the public and also inform our understandings of the past. These case studies include (1) our use of GIS methods and spatial statistics to create intuitive visualizations of gradiometry survey results at a multicomponent Woodland site in Iowa significantly impacted by decades of cultivation; (2) a multi-instrument survey at Wright-Patterson Air Force Base in Ohio to identify the remnants of a historic community forced to move following the Dayton Flood of 1913, a site of considerable interest to resource managers and the local public; and (3) our assessment of the National Historic Landmark designation of an Initial Coalescent fortified village in South Dakota based on a gradiometry survey, the results of which also reveal new information with historical implications for the site's fifteenth-century occupants.

Wilcox, Michael [25] see Lippert, Dorothy

**Wilke, Detlef and Peter de Smet**

[182]

*A Collaborative Proposal for Identifying Psychoactive Drug Ingredients in Supposed Ritual Pottery and Other Implements from the Prehispanic Andes*

In recent years several studies have documented plant secondary metabolite containing residues in archaeological find material, extending the supposed utility of vessels and other implements to the ceremonial and religious-ritual domain. Inter alia cacao, coca, and tobacco related compounds were identified with LC/MS/MS analytics in the nanogram scale. We suggest a collaborative research proposal to archaeologists and analytical chemists to search for organic use residues in such important vessel types like the stirrup spout bottle, double and single spouted bottles, which are Leitfossils in Peruvian archaeology, as well as similar containers of unknown primary functionality in the Andes from Columbia to Chile and Northwest Argentina. We suggest a validated search strategy for detecting intoxicating, hallucinogenic, and other psychoactive compounds, which are ethnographically and ethnohistorically documented, though its physical containers and administering devices are previously undiscovered.

Wilkins, Jayne [151] see Collins, Benjamin

Wilkins, Jayne [151] see Schoville, Benjamin

**Wilkinson, Darryl (Dartmouth College)**

[145]

*A New Bethel? Catholic Landscapes of the Northern Rio Grande*

Following the incorporation of New Mexico into the Spanish Empire, Christianity became an ever more powerful force across the region. Traditionally, we think of Christianity as a "world religion," by definition a trans-local phenomenon. Moreover, whenever Christianity takes on any "local" characteristics, it is assumed that this represents a syncretic dilution of its essential worldliness. Yet much is missed in conceptualizing Christianity as a religion of routes rather than roots—at least with respect to New Mexican Catholicism. In this paper, I examine how new forms of ritual landscape emerged in a place that was increasingly as Catholic as it was Native. Specifically, I focus on the complex relationships between Catholic petroglyphs and older shrine features found along the northern Rio Grande. It is argued that neither the anthropological concept of the "sacred landscape" nor the theological concept of a "Holy Land" fully captures the reality of how the Catholic-Native communities of New Mexico engaged with place.

**Wilks, Stefania (University of Utah), Lisbeth Louderback (Natural History Museum of Utah) and Shannon Boomgarden (University of Utah)**

[41]

*Starch Granule Size and Morphology as a Proxy for Water Influence on Zea mays*

A wealth of information on regional patterns of human subsistence and plant domestication has been generated from studies on the starch granules of *Zea mays* (maize). Very little work, however, has been conducted on how the size and structural attributes of those grains might change if exposed to different environmental contexts (e.g., the amount of a water parent plant receives). In the arid Southwest, the role of irrigation in growing maize is an important parameter in many foraging models. Our study seeks to determine if there are significant changes in the morphological attributes of starch granules from maize planted at Range Creek Canyon and watered under two different irrigation regimes: no watering and ample watering. Our results provide data on the effect

of irrigation on the size and morphology of starch and, therefore, have implications for identifying archaeological maize and possibly determining past water regimes at Range Creek Canyon.

Wilks, Stefania [41] see Boomgarden, Shannon

Williams, Justin [74] see Thulman, David

Williams-Forsen, Psyche [156] see Chiou, Katherine

#### **Williamson, James (Memorial University Newfoundland)**

**[103]**

##### *Beothuk Housepits in Virtual Environments*

The archaeology of interior Newfoundland is a poorly understood subject, and yet, there are more than 70 Beothuk housepits in the Exploits River Valley, comprising the majority of these features. The topography of these features has been recorded using traditional survey methods, producing poor data for spatial and morphological studies. This study reexamines these features through photogrammetric recording of Beothuk housepits as high-resolution 3D models. The 3D models of these features were then imported to a GIS to analyze their internal architecture using an experimental approach to visualizations. Approaching visualizations in this manner permits archaeological inferences about the surficial remains of structures through improved visibility of micro-topography. This study challenges prior beliefs about the paucity of internal features including benches and hearths, the external shape of the housepits, and the methods used here have allowed postdepositional processes such as looting and erosion to be analyzed.

Williamson, James [103] see Holly, Donald

Williamson, James [179] see Whitridge, Peter

#### **Willis, Mark (Flinders University) and Satoru Murata**

**[80]**

##### *High-Resolution Landscape-Level Mapping in the Western Lagoon of Belize*

During the summer of 2016, large-scale unmanned aerial vehicle (UAV) mapping was conducted in the Western Lagoon near Crooked Tree, the largest inland perennial wetland in all of Belize. Our aim was to record a series of linear features in the wetlands that may represent ancient Maya canals and other features possibly related to transportation, irrigation, aquaculture, and agricultural production. The aerial survey, comprising over 44 km<sup>2</sup>, is the largest ever conducted in Belize with a UAV. The logistics of this large-scale aerial survey will be presented along with our preliminary findings and interpretations of these features. Excavations carried out in subsequent field seasons are aimed at testing some of these hypotheses.

Willis, Mark [53] see Francis, Julie

#### **Wilson, Douglas (Portland State University/National Park Service), Theresa Langford (National Park Service) and Meagan Huff (National Park Service)**

**[183]**

##### *Navigating Archaeological Research and Collections at Fort Vancouver National Historic Site*

Since 1947, the National Park Service and its collaborators have excavated at Fort Vancouver National Historic Site, a nineteenth-century fur-trade and US Army colonial site in the Pacific Northwest of the United States. Museum collections are dominated by archaeological collections from American Indian and colonial contexts associated with the National Park Unit and related, affiliated sites. Challenges to collections management include refining and sampling in the face of interest from multiple stakeholders, including academic and Indigenous communities, and changing theoretical directions in archaeology. The lessons learned from 20 years of collaboration between archaeologists and museum curators suggest that museum curators should assist in the formulation of archaeological research designs, including the development of protocols for artifact sampling to mitigate future issues with preservation, storage, redundancy, and potential deaccessioning. Archaeologists and curators should develop proactive protocols for archaeology that address collections management. This is particularly important for park units with collections that do not have permanent staff archaeologists and/or curators.

Wilson, Jeremy [97] see Krus, Anthony

Wilson, John [131] see Langlie, BrieAnna

#### **Wilson, Kurt (University of Utah), Daniel Contreras (University of Florida), Joan Coltrain (University of Utah), D. Craig Young (Far Western Anthropological Research Group) and Brian Coddington (University of Utah)**

**[39]**

##### *Evaluating the Impacts of Past Climate Change on Demographic and Subsistence Patterns in the Basin-Plateau Region of Western North America*

Archaeological and paleoclimatological research increasingly reveal long-term impacts of past climate on human subsistence,

settlement, and demography, yet positive results are debated and the underlying dynamics structuring these correlations remain questioned. Coupling a comprehensive dataset of radiocarbon-dated archaeological sites with both modeled and proxy-based paleoclimatic reconstructions, here we evaluate how temporal patterning in inferred population density varies as a function of past climate change, applying novel taphonomic controls to improve the reliability of the results. Particular focus is given to (1) dynamics across the Pleistocene-Holocene transition and (2) the Late Holocene adoption, and subsequent abandonment, of maize agriculture.

**Wingfield, Laura (School of Art and Design, Kennesaw State University)**

[139]

*Jaguar Fur, Snake Skin, Woven Baskets, and the Milky Way: The Dot-Grid Pattern from Nicaragua to Ecuador*

Dotted grids abound in art of Pacific Nicaragua southward through Costa Rica and Panama to Ecuador, whether on painted and incised ceramic vessels or chiseled stone sculptures. These images reflect ancient fiber arts now lost to the elements in these tropical lands. The designs, recorded on clay and stone, appear to detail long-held beliefs—holes in basketry weaves as jaguar spots, according to the Yaminahua of Amazonia. Variations on the dot-grid pattern seem to reflect Ecuadorian ideas of a powerful sacred serpent associated with the Milky Way who traverses the realms of the living and the dead. Some figurines show both jaguar and serpent variants in alternating quadrants. Could these patterns refer to the Rainbow Serpent and to Grandmother Wildcat, an ancient Central American spirit and life-giver? Are we seeing in these terse designs shorthand for the creation stories of the peoples at the center of the Americas? In this paper I will explore variations on the dotted-diamond-grid design not only from a technical exploration of worked fibers (made permanent in clay and stone) but also from an iconographic viewpoint as relates to the varying yet related cultures of the tropical lowlands of Nicaragua to Ecuador.

Winkler, Stephan [151] see Fisher, Erich

Winter, Marcus [171] see Minc, Leah

Wisner, Gavin [23] see Roa, Ian

**Witcher, Robert and Emily Hanscam (University of Amsterdam)**

[144]

*Women in Antiquity: An Analysis of Submissions, Peer Review, Editorial Decisions, and COVID-19*

Recently, some academic archaeology journals have evaluated the gender distribution of authors, often finding female contributors underrepresented. *Antiquity* is a journal of world archaeology with submissions from authors of many nationalities; however, we lacked data on the gender of our authors. We therefore analyzed the gender distribution of submissions from 2015 to 2019. Data from the ScholarOne submission system were supplemented with online research to establish the gender identity of authors based on self-identification. All submissions were classified as female/male single or first author—we identified no nonbinary authors. We then tracked the editorial decisions on papers, providing a longitudinal dataset with which to contextualize the authorship of the articles published each year. In addition, we undertook a parallel analysis of the gender of peer reviewers. Our analyses, completed in late 2019, were undertaken in order to establish a quantitative baseline against which to measure future performance. Unexpectedly, COVID-19 demonstrated the value of such statistics. Early in the pandemic, several editors observed a decline in numbers of submissions from female authors. We were therefore able to extend our dataset into 2020 and to assess whether the coronavirus had a disproportionate impact on the ability of women archaeologists to submit research.

Witelson, David [151] see de la Peña, Paloma

**Witmore, Christopher (Texas Tech University)**

[85]

*Sværholt, World War II History, and Archaeology*

What difference does an archaeological approach make to a period saturated by historical documents, photographic archives, and recordings of eyewitness accounts? Since 2011 a group of archaeologists have undertaken fieldwork at a World War II prisoner of war camp at Sværholt in Norway's far north. The labor camp for Soviet prisoners was established in 1942 as part of the construction of the German coastal battery at Sværholt, a fortification within the Atlantic Wall. In late fall 1944 the camp, the coastal fort, and the local Norwegian hamlet were abandoned and destroyed in step with the massive and abrupt German retreat from this northern region. This paper explores the afterlife of the camp and the coastal fort and shares details of the excavation and archaeological finds. In weaving a path alongside objects revealed over the last nine summers at Sværholt this paper indicates how the things found challenge our common assumptions about the relationship between prisoners, guards, and locals. Ultimately, it provides suggestions as to what an archaeological account may look like as a complement and alternative to event-oriented histories.

[85]

Chair

**Witt, David (NYS Department of Environmental Conservation)**

[26]

*Remote Sensing of Chacoan Roads in the Middle San Juan Region*

This poster demonstrates recent applications of remotely sensed data to track Chacoan roads in the Middle San Juan Region, specifically the use of high resolution (1 m) Digital Elevation Models obtained from Light Detection and Ranging (lidar) data and multispectral imagery obtained from the Advanced Spaceborne Thermal Emission Reflectance Radiometer (ASTER) instrument to track a potential route between the Aztec Community and the Holmes Group through the Farmington Glade and surrounding mesas. These data sources, in combination with historical aerial imagery, spaceborne orthoimagery, and archaeological site data obtained from the New Mexico Cultural Resources Information System (NMCRIIS), allow for the continued development of a geographic record for potential Chacoan roads that is ready for ground truthing.

**Witt, David (NYS Department of Environmental Conservation)**

**[160]**

*Moderator*

**Witt, David (NYS Department of Environmental Conservation)**

**[176]**

*Discussant*

Witt, David [176] see Richards-Rissetto, Heather

**Woldekiros, Helina (Washington University in Saint Louis), Michael Harrower (Johns Hopkins University) and Catherine D'Andrea (Simon Fraser University)**

**[94]**

*Feeding the Pre-Aksumite and Aksumite Society: Subsistence Strategies of Cities, Towns, and Urban Centers in the Horn of Africa (800 BCE–900 CE)*

Local and long-distance trade and productive agricultural systems contributed to establishing complex socioeconomic institutions in the Horn of Africa between 800 BCE and 900 CE. Several important urban centers and towns, such as Yeha, Aksum, and Matara, emerged during the pre-Aksumite (>800 BCE–400 BCE) and Aksumite (400 BCE–900CE) period in the North Ethiopian and Eritrean highlands. Robust local and regional food provisioning systems paved the way for life in urban centers and facilitated political centralization, stability, and specialist production of spectacular architecture, art, and religious centers. However, despite the critical role of local and regional trade and agriculture in sourcing urban food supplies, such systems have received limited scholarly attention. Thus, this paper uses faunal data from the sites of Beta Samati, Mezber, and Aksum in northern Ethiopia and historical texts to show how food was supplied to prehistoric urban centers and document the larger provision systems in place to support this urban distribution. Domestic livestock, especially cattle, sheep, and goats, were the main staple of urban society in the Horn of Africa.

**Wolfe, Allison (University of Utah)**

**[42]**

*Avifauna of the Bonneville Basin: Past Variation and Future Conservation*

The final regression of Lake Bonneville during the Pleistocene/Holocene transition resulted in dramatic environmental changes in the Bonneville basin, followed by further environmental fluctuations throughout the Holocene. Recent research of faunal and floral remains throughout the basin has increased our knowledge of the corresponding biotic changes that occurred in the region. The dynamics of the region's avifauna, however, remain poorly understood due to a limited availability of avifaunal assemblages that cover this period. Homestead Cave is the only site within the basin that has produced a substantial, fine-grained avifaunal record that spans the past 13,000 years. Identification of the changes in taxonomic composition of the Homestead Cave avifauna throughout this long record allows for study of the response of certain taxa to shifts in different environmental factors. This analysis has important implications for the modern conservation and management of birds, including that of the Greater Sage-Grouse, which represents one of the most prominent and controversial wildlife conservation issues in western North America today.

Wolff, Christopher [103] see Holly, Donald

**Wolffhagen, Jesse (Max Planck Institute for the Science of Human History)**

**[173]**

*Why Not a Bayesian Archaeology? Debunking Misconceptions about Bayesian Statistics*

Bayesian inference has become a popular framework for statistical analyses across scientific fields in the past several decades, thanks to the development of software for generalized or specialized Bayesian modeling. With the logistical barriers to Bayesian inference becoming less onerous, a wide variety of Bayesian applications have started to appear in scientific fields, including archaeology. While increased exposure to myriad applications normalizes Bayesian statistics in archaeology, misconceptions about the nature and application of Bayesian methods to archaeological problems remain and get in the way of broader and creative applications in the field. Here, I explore and attempt to correct misunderstandings about (1) prior distributions, (2) how Bayesian statistics is performed, and (3) when is a Bayesian approach appropriate. By reducing anxieties surrounding the proper use of Bayesian statistics in archaeology, I hope to encourage further use of this approach to explore a wide variety of archaeological questions and to normalize the use of Bayesian inference in our research and models.

**[173]**

*Chair*

**Womack, Andrew (Furman University)****[125]***Ceramic Production at the Stone-Walled Citadel of Shimao: Initial Results of Petrographic Analysis*

Over the last 10 years, excavations at the early Bronze Age site of Shimao (2300–1800 BC), in northern Shaanxi Province, have transformed our understanding of the archaeology of early China. What was previously seen as an area that was peripheral to the development of early dynastic centers is now being heralded by some scholars as the precursor of Chinese civilization. However, despite incredible finds of large-scale stone architecture, bronze working, jade artifacts, and elaborate stone carvings, our overall understanding of the economic and political organization of the inhabitants of Shimao is still very limited. In this presentation I examine the most common artifact class at the site, pottery, using petrographic analysis, in order to explore production methods, as well as potential production organization and exchange. The results demonstrate that most of the pottery used at Shimao was produced locally, likely by multiple production groups at or near the site, but was not particularly standardized in regard to paste recipes. Thus, ceramic production was likely not tightly controlled or formalized, but instead took place in local households or workshops, and is not significantly different from ceramic production organization at sites across northern China at this time.

**Wong, Gillian (University of Tübingen), Dorothée Drucker (Senckenberg Centre for Human Evolution and Palaeoenvironment), Britt Starkovich (University of Tübingen) and Nicholas Conard (University of Tübingen)****[72]***Heterogeneity in Late Glacial Environments of Southwest Germany and Implications for Magdalenian Settlement*

During the Late Glacial (~18–11.6 k cal yr BP), Magdalenian peoples recolonized southwest Germany, which was uninhabited during the Last Glacial Maximum (~27.2–23.5 k cal yr BP). Past research has generally characterized the landscape in this region as tundra or steppe during this time but making smaller-scale interpretations can be difficult due to the nature of the fossil record. To tackle this problem, we pair stable isotope analysis of large ungulates with the analysis of a micromammal assemblage from Langmahdhalde, a Magdalenian site in the Swabian Jura of southwest Germany. We apply bioclimatic models to the micromammal assemblage to predict several climate variables, including temperature and length of vegetative activity period. Additionally, we present carbon and nitrogen stable isotope data from bone collagen of reindeer and horse. We reconstruct a mostly tundra environment with pockets of denser vegetation, including trees, and argue that this heterogeneous environment was likely more productive and had a higher diversity of species than modern tundra environments. This may have been one of the reasons that Magdalenian settlement was successful in this region and may, at least in part, explain the regional nature of Central European settlement strategies during this time.

Wong, Mercedes [29] see Heidkamp, Blair

Woo, Jason [71] see Tran, Justin

**Woodard, Buck (American University) and Danielle Moretti-Langholtz (William & Mary)****[163]***Provenance and Power: Decolonizing Powhatan's Mantle*

Popularly known as "Powhatan's Mantle," the shell-decorated and sewn animal skins are an iconic object of material culture from seventeenth-century Virginia. On display in the Ashmolean Museum in Oxford, England, we argue that the mantle's provenance and possible links to Indigenous cosmology have been obscured by four centuries of colonial domination and interpretation. This paper will review the mantle's known chain of possession from archival and historical references to the Tradescant family and more recent direct physical observations of the object. In an effort to decolonize the mantle we draw on Indigenous cosmologies and iconographies as a possible way to relink the object to a dynamic and symbolically rich Algonquian worldview.

Woodhead, Genevieve [26] see Schleher, Kari

**Woodson, Kyle (Gila River Indian Community)****[131]***Finding and Understanding Ancient Hohokam Irrigated Agricultural Fields in the Middle Gila River Valley, South-Central Arizona*

For over a century, archaeologists have investigated the vast network of prehistoric Hohokam canal irrigation systems in the lower Salt and middle Gila River valleys in southern Arizona. However, documentation of the agricultural fields in which prehistoric farmers irrigated their crops generally was lacking until the last 20 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. The Gila River Indian Community's Cultural Resource Management Program has devoted extensive efforts to documenting the ancient Hohokam canal systems in the Middle Gila River Valley. In this paper, I present an example where archaeological and pedological evidence provide a clear demarcation of the fields that were irrigated along the Snaketown Canal System. Moreover, these data indicate that the soils in the Snaketown fields represent an irrigic anthrosol, a soil type that forms from the prolonged deposition of fine sediments from irrigation water. This pedostratigraphic unit was formed by a millennium of irrigation from AD 450 to 1450. This study greatly expanded our understanding of the agrarian landscape of the Snaketown Canal System.

Woodson, Kyle [87] see Morgan, Linda

Woodson, Kyle [143] see Plumlee, R. Scott

**Woollett, James (Université Laval - Centre d'études nordiques) and H  lo  se Barbel (Universit   Laval - Centre d  tudes nordiques)****[148]**

*From Omajuk to NiKik: The Variable Transformation of Animals into Social Things among the Historic Period Labrador Inuit*

Archaeological studies have conventionally regarded Inuit relationships to animals in terms of subsistence and food-getting, from seasonality and hunting strategies to calories of meat, fat, and marrow consumed. Inuit oral traditions and ethnographic sources, however, offer a richer narrative of subsistence than archaeologists have succeeded in portraying, one including the ideological significance of animals, their spiritual autonomy, and the multiple transformations of social meanings attached to animals during their appropriation, dismemberment, and disembodiment. This study will reexamine seal, dog, fox, and caribou bone across a set of historic period sites in Nunatsiavut (Labrador) in order to explore the potential of a social zooarchaeology of Inuit-animal interactions. As a starting point, differences in the treatment of live animals and postmortem treatment of carcasses related to butchery, food preparation, and other forms of exploitation were examined through comparisons of pathologies, cut marks, and other tool marks in assemblages from midden, house floor, and cache contexts, with different treatments clearly being accorded to different animals. These differences likely relate in part to functional variables such as anatomy and seasonality but also to conceptual distinctions between animals derived from ideology, habitus, and the introduction of commercial trapping and hunting practices.

Woollett, James [148] see Mareng  re, V  ronique

Worth, John [169] see Eschbach, Krista

**Wright, Joshua (University of Aberdeen)****[93]***Chair***Wright, Rita (New York University)****[115]***Discussant***Wright, Sterling (Penn State University), Courtney Hofman (Oklahoma University), Kristen Rayfield (Oklahoma University), Nihan Dagtas (Oklahoma University) and Adam Rabinowitz (University of Texas, Austin)****[174]***The Integrity of Biomolecules across the Oral Matrix from Histria, Romania*

During the Archaic period (seventh century–sixth century BCE), Greek colonists from Miletus founded the city of Histria. Located near the mouth of the Danube, this urban center experienced 13 centuries of environmental and demographic changes. Archaeological investigations over the past century have yielded a rich skeletal collection that is housed in the Fr. J. Rainer Institute of Anthropology in Bucharest. Several researchers have performed archaeological and osteological analyses on these remains, but no one has applied biomolecular techniques. To assess biomolecular preservation at the site, this project applied metagenomic sequencing to two dental calculus and two dentin samples and additionally carried out a proteomic analysis of sex-specific peptides on two dentin samples. All samples date to the Roman imperial period. Our analyses indicate adequate preservation. Microbial analyses suggest that the calculus samples contain human-associated oral taxa. While the human analyses identified two haplotypes, they indicate that the human samples may have some contamination. Nevertheless, a damage analysis revealed shallow levels of damage in the microbial and human sequences. Additionally, we identified the sex of two individuals using minimally destructive proteomic methods. These results provide a direction for potential research on the skeletal remains.

Wu, Si [72] see Rayfield, Kristen

Wu, Yue [1] see Chen, Ran

**Wyatt, Andrew (Middle Tennessee State University) and Laura Furquim (Universidade de S  o Paulo)****[66]***Archaeological Plant Remains from the Lower Xingu*

Recent archaeological excavations at the sites of Jacup  , Carrazedo, and Gurup   in the Lower Xingu in the Brazilian Amazon have implemented a significant program for the recovery of plant remains, resulting in a large archaeobotanical assemblage currently undergoing analysis. Recent archaeobotanical research in Amazonia has focused on and identified large-scale processes of environmental change, domestication, and agricultural practices; however, archaeobotanical studies that aim to identify local and short-term environmental and cultural processes are less common. The analysis of plant remains from these smaller sites can provide information on local environmental change, plant use, and also provide insight into the process of the manufacture of Amazonian Dark Earths (ADE). In this presentation, we will discuss the preliminary results of our analysis of the archaeobotanical remains from these sites, and situate the data within the local environmental context of this region. In particular, we will discuss the plant remains recovered specifically from ADE contexts and suggest possible techniques for ADE manufacture.

**Wyeth, Heuionalani (Pacific Traditions Society)****[121]***Moderator***[121]***Discussant*

Wygall, Brian [21] see Holt, Evan

**Wyllie, Cherra****[107]***Chair***Wyllie, Cherra****[122]***Cerro de las Mesas Monument 2*

Cerro de las Mesas Monument 2 is a colossal portrait head. Its flattened rear surface contains a relief-carved scene with a ruler in a broad-brimmed hat, vanquished captive with a calendric sign above his or her head, and a worn hieroglyphic text placed between them. In its entirety Monument 2 bridges the site's Olmec heritage with Late Classic Veracruz conventions of image and text, forming a microcosm of Cerro de las Mesas elite traditions. While the enormous head on the obverse of the monolith is reminiscent of Tres Zapotes monumental sculpture in both form and detail (such as the three tear-like striations beneath the eyes), other elements, including the trefoil headdress and buccal mask, anchor it firmly to Early Classic ruler portraits on Cerro de las Mesas stelae, a point noted by Mathew Stirling. Moreover, the dissociated head and fleshless jaw are consonant with the decapitated ruler with detached mandible interred in Cerro de las Mesas Burial II-18 amid lavish grave goods, including a plain stone yoke. Rulers on Cerro de las Mesas stelae are frequently dressed as ballplayers. Similarities between Burial II-18 and Monument 2 offer renewed credence to the notion that colossal heads represent rulers as ballplayers.

**Wynne-Jones, Stephanie (University of York)****[124]***Discussant***Xiao, Yuqi (Chinese University of Hong Kong)****[141]***The Making of Bronzes and Frontiers: An Archaeometallurgical Case Study of Bronze Finds in Southern Hunan, China, from 475 BCE–220 CE*

In both historical texts and modern narratives, the southern frontiers of China throughout the Pre- and Early Imperial era have been oversimplified as a geographical and cultural composite with underdeveloped conditions that have been slowly, but effectively, penetrated by the more civilized, powerful central state. This research aims to break such conceptual bias and provide innovative insights into the frontier study using a microscopic case study of the bronze objects in Chenzhou, Hunan, unearthed from graves dating to the Warring States to Eastern Han periods. Through integrating a metallurgical perspective with the typological study and employing a theoretical framework of frontier study to organize multiple lines of analytical results, this research examines the diachronic changes on bronze production and consumption patterns in the region and contemplates the social reaction to external stimulations and inner epistemological transformation of this frontier society under a sociopolitical background of imperial transition. It also highlights a dynamic, multidimensional frontier style that characterizes the southern frontiers and further enriches the concept of "Sinicization" through interpreting the material traces of interregional interactions.

**Xiuhtecutili, Nezahualcoyotl (Tulane University)****[73]***Moderator*

Yacobaccio, Hugo [72] see Samec, Celeste

**Yaeger, Jason (University of Texas, San Antonio)****[45]***Discussant***Yamamoto, Atsushi (Yamagata University), Juan Pablo Vargas (Gobierno Autónomo Descentralizado del Cantón Cuenca) and Oscar Arias Espinoza (Universidad Nacional Mayor de San Marcos, Peru)****[149]***Investigations in the Valley of Cañar, Ecuador: Preliminary Results at Cerro Narrio and Loma de Pinshul*

The Cañar Valley, located in the southern part of Ecuador, is one of the most important regions with archaeological evidence in the country. Located in this area are the archaeological sites Cerro Narrio and Loma de Pinshul. Seated on top of natural elevations that rise above the valley, both sites have the peculiarity of facing each other. We will present the preliminary results of the investigations

that we began to carry out in 2019. This is based mainly on the study of the various movable and immovable elements identified during our excavations. This allows us to define the occupational sequence, chronology, and relationship between the two sites during the Formative period.

Yamano, Hiroya [83] see Weisler, Marshall

Yan, Yimeng [22] see Crimmel, Thomas

Yañez Nieto, Aracely [63] see Espinoza Sánchez, Marco Antonio

**Yann, Jessica (Michigan State University)**

[117]

*Resource Dependency Theory: A New Approach for Examining Trade Relationships*

Eighteenth-century trade and exchange in the Midwest has been characterized by give and take relationships (such as Richard White's middle ground) between Native American groups and Euro-American traders. Looking for new ways to think about the nature of these relationships, and borrowing from business and organizational studies, resource dependency theory (RDT) has provided a better understanding of the power dynamics implicit in these economic exchanges. In this paper, several case studies are presented that show the efficacy of applying this framework, including both its capability for quantifying these relationships and providing more nuanced interpretations of the interactions occurring between these groups.

[117]

Chair

**Yaworsky, Peter (University of Utah)**

[175]

*The Interactive Effects of Risk and Climatic Variation on Food Storage Behavior*

Risk, or variation in outcomes, is an inherent part of the human condition and can result in the adoption of complex behavioral patterns that seemingly contradict expectations of human rationality. Thus, complex patterns of behavioral adaptation may require considering how risk constrains or encourages decisions. Here, we build on existing frameworks to create a formal mathematical model of risk by integrating components of behavioral ecology with utility theory allowing for the decomposition risk. Using the formal model, we then derive predictions to explain the diverse food storage strategies undertaken by Formative period (2100–500 BP) agriculturalists on the West Tavaputs Plateau in central Utah, known as the Fremont. We then test these predictions using construction and abandonment sequences derived from <sup>14</sup>C AMS dates relative to a paleoenvironmental reconstruction.

Yellen, John [170] see Porter, Joshua

Yijia, Qiu [152] see Shaw-Müller, Kyle

Young, D. Craig [39] see Allgaier, Paul

Young, D. Craig [6] see Grund, Denay

Young, D. Craig [95] see Vernon, Kenneth

Young, D. Craig [39] see Wilson, Kurt

**Young, Jessica (Unity College)**

[163]

*Taskscapes and Social Sustainability: Archaeobotanical and Ethnohistorical Interpretations from the Chesapeake*

The "taskscape," or a landscape comprised of actions and labor (Ingold 1993, 2000), provides a means for assessing the change and continuity of a place over time. Through the study of plant remains (including macrobotanical remains, phytolith residues, and starch grains), taskscapes from the Late Archaic through the early colonial era are evaluated in Tidewater Virginia and the Chesapeake. The archaeobotanical data are informed by both the broader archaeological record as well as regional ethnohistories to interpret how these taskscapes might connect with the activities of men, women, and children. This paper seeks to bridge the divide between the precolonial and postcolonial pasts through the lens of a sustainable society (environment, economics, and social [Brundtland Report 1987; SD2015]). In addition to environmental and economic sustainability, social sustainability likely played an important role in the formation of persistent places, or places returned to over many years of time (Schlanger 1992), in Tidewater Virginia. By considering human relationships within taskscapes, this paper explores social sustainability through activities and tasks associated with the archaeological record.

**Young, Michelle (NMAI Smithsonian)**

[90]

*Local Politics, Money, and Power: Navigating Archaeological Heritage in the Peruvian Highlands*

There are millions of rural, Quechua-speaking peoples living today in the modern nation of Peru. However, living populations do not



always self-identify as descendants of the ancient communities that archaeologists study. There are complex reasons for this apparent disjuncture between ancient and contemporary peoples, some of which include social stigmas against Indian identities; Peru's distinct political trajectory in cultural heritage management; and the reality of prehispanic and modern migrations, which have displaced ethnic groups from their places of origin. In this paper, I present a case study from an archaeological project that I directed in Huancavelica, Peru, to explore some of the complexities of navigating heritage decisions in the Andes. I demonstrate that stakeholder attitudes can be both contradictory and evolving, and that local power struggles come to bear heavily on these negotiations. Finally, I argue that to become better allies of living Andean communities, archaeologists must be sensitive to their true needs and remain flexible as they set the agenda, rather than following models of community archaeology derived from North America.

**Yu, Pei-Lin (US Army Corps of Engineers)**

**[141]**

*Island Arrivals: The Ideal Free Distribution and Prey Choice Models in Neolithic Taiwan and Beyond*

In the Neolithic transition of Taiwan, current evidence indicates that farmer-gardeners immigrated from China's southeast coast about 6000 BP and brought a diverse subsistence of cultivation, foraging, and fishing. The migration would have influenced habitat choice and interactions with Paleolithic foragers already existed in residence. The Ideal Free Distribution with the encounter-contingent Prey Choice Model predicts that groups moving into new habitats will settle first in high-ranked locations, then growing densities will deteriorate those habitats to the point that migration begins toward second-ranked habitats. The Despotism Variant predicts that in cases where prime habitats are already occupied, immigrants will be forced to settle in low-ranked locations. In contrast, the IDF with Allee Effects describes density-related niche construction and habitat modification that may actually increase encounters with preferred prey or resources. In this paper, environmental, archaeological, and ethnographic data from Amis farmer-gardeners of Taiwan are used to evaluate and derive evidence to test these alternative predictions.

**[141]**

*Chair*

Zacharias, Laura [77] see Newlander, Khori

**Zaneri, Taylor (University of Amsterdam)**

**[115]**

*Enacting Health in the Medieval City: A Geospatial Analysis of Waste and Water in Bologna*

What was a healthy and clean city in medieval Europe and how was this achieved? How did cities oversee the disposal of domestic and industrial waste and the preservation of clean water? This paper examines how refuse management was handled by households, workshops, and neighborhoods from AD 1200 to 1500 in medieval Bologna. Using archaeological data from 12 published excavations from across Bologna, along with historical population data in GIS, this paper examines how waste management spatially varied across the medieval city. How were different types of refuse (household, industrial, and sewage) managed? This information is correlated with the (1) canal system in Bologna (which was used for both industrial production and waste removal purposes) and (2) medieval public wells (which supplied water for many inhabitants of Bologna). Were their areas or zones within the city that bore a greater burden of material waste or polluted water? How were cleanliness and "public health" differentially experienced in the medieval city? In sum, this paper investigates the connections medieval people made between human behaviors and urban health, how health was enacted through the management of waste and access to clean water, and how this differed spatially among the citizens of Bologna.

**[115]**

*Chair*

Zaneri, Taylor [129] see Crabtree, Pam

Zapata, Carlos [118] see Bazán Pérez, Augusto

**Zborover, Danny (Pacific Rim Project)**

**[135]**

*Debating Oaxaca Historical Archaeology*

"Prehistory is passé" write Schmidt and Mrozowski in their 2013 essay "The Death of Prehistory," and this should definitely be the case for Oaxacan archaeology. But although most scholars would agree that Oaxaca may have seen the first literary civilization in the Americas, not all would subscribe to calling these people, or our reconstructions of them, "historical." In this presentation I will draw from Indigenous sources and genres to reframe the study of Oaxaca's past under the paradigm of historical archaeology on the one hand, and "deep time history" on the other (following Schmidt and Mrozowski 2013). I will focus primarily on two case studies to illustrate my point, a past-to-present perspective that traces the millenary historical genre of "territorial-narratives," and a present-to-past perspective that highlights Indigenous performative oral histories that encapsulate continuous colonial processes—Indigenous and European—on the Pacific coast. By shifting our archaeological gaze from the prehispanic/colonial dichotomy, this long-term approach to culture change and continuity further allows us to fully understand the impact of the Indigenous people on the formation of the so-called modern world.

Zeanah, David [39] see Allgaier, Paul

Zeanah, David [175] see Codding, Brian

Zeanah, David [95] see Vernon, Kenneth

Zeidler, James [130] see Buck, Caitlin

**Zender, Marc (Tulane University)**

**[76]**

*The Snake Dynasty: What We Know and What We Don't*

Epigraphic discoveries of the last few years now make possible a fresh engagement with questions about the origins and development of the Snake dynasty, of its external political influences during both the Early and Late Classic periods, and of the multiple physical centers from which the dynasty held sway. On present evidence, the Snake dynasty seems to have emerged at or near Dzibanché in the late first or early second century AD, and during the next 600 years it would experience a dramatic series of successes and reversals including a dramatic sixth-century expansion, a disastrous seventh-century civil war, and a relocation of its capital to Calakmul during the long reign of Yuhknoom Ch'een (AD 635–685) and two successors. Perhaps of equal importance with its political influence were the unique cultural elements either introduced or disseminated by the Snake dynasty during its ascendancy: market economies, public sports, increased prominence of women in public art, and increased visibility of non-royal nobility. Several of these features seem to have survived the early ninth-century collapse, influencing later Maya civilization of the northern lowlands and southern highlands.

**Zhang, Peiqi (University of California, Davis), Caleb Chen (University of California, Davis), Christopher Beckham (University of California, Davis), Daniel Goring (University of California, Davis) and Meredith Carlson (University of California, Davis)**

**[31]**

*Manufacturing Costs of Long Pestles in Late Period Central California: Results from Replicative Experiments*

The shift to mortars and pestles is associated with the acorn-based resource intensification in central California, which is also linked with decreased mobility and changes in social organization. Many long (>35 cm) and completely shaped pestles are associated with Late period California (cal AD 1265–1770) contexts, particularly burials, and also appear in a number of ethnohistoric photos of women pounding acorn. Given the central role these tools played in daily life, and the personal connection they seem to have had with individuals, we sought to learn more about their manufacturing costs and sequence of manufacture. Our initial attempts to manufacture basalt pestles met with a very high failure rate (75%); suitable raw materials were also difficult to find. In comparison, here, we also present the results of a subsequent series of graywacke manufacturing experiments designed to understand how raw material selection may significantly impact manufacturing success, as well as the operator skill. Moreover, we explore the sequence of pestle manufacture with respect to specific debris that may be left behind in the archaeological record.

Zhang, Peiqi [31] see Carlson, Meredith

Zhang, Peiqi [31] see Chen, Caleb

Zhao, Jian-xin [83] see Weisler, Marshall

**Zimmermann, Julie (Southern Illinois University, Edwardsville)**

**[120]**

*Storytelling in the Creation of Cahokia, a Native American Theater State*

I have argued that Cahokia might best be understood as the capital of a Native American theater state, which drew people to it and spread its influence not through armies but by attracting followers through theatrical rituals (Zimmermann Holt 2009). In current research I argue that storytelling was primary among those rituals. Arguably all humans define and create the perceived world through language and stories; storytelling is a central ritual in oral societies, the foundation for all other rituals. Traditional Native American beliefs indicate that words form the world; contemporary Native American viewpoints also suggest that stories are essential and create the world. Cahokian stories were remembered and commemorated with Braden-style artworks made at and disseminated from Cahokia. Primary among these stories was that of a great hero who wore human head earrings. Other stories were told at Cahokia, but the stories of heroes are those most often depicted in Braden-style artworks found far from Cahokia. The dissemination of hero stories supports the notion that Cahokia was a state; heroic storytelling was central to the growth of the state. Cahokians created their world through stories, but it was through hero stories that they grew their authority in far-flung societies.

Zimpel, Carlos [87] see Pugliese, Francisco

Zipkin, Andrew [96] see Ambrose, Stanley

Zipkin, Andrew [40] see Murray, John

**Zori, Colleen (Baylor University)**

**[70]**

*Life and Death in Medieval San Giuliano (Lazio Province, Italy)*

The medieval period in northern Lazio saw significant restructuring of social and economic relationships through *incastellamento*, the process by which people chose or were forced to move onto fortified hilltops. Here, I present results from four seasons of

mapping, drone photogrammetry, excavations, and analysis of a castle complex located atop the San Giuliano plateau. New radiocarbon dates, combined with artifact and architectural analysis, establish the sequence of occupation of a hall and a semi-subterranean mortuary structure thought to have been attached to an as-yet unexcavated chapel. Economic activities, including trade and feasting, were carried out by the living and indicate a growing degree of wealth and prestige of those using the hall. Meanwhile, the dead were interred in slot graves and in architectural support trenches in a narrow rectangular structure at the eastern end of probable chapel. Preliminary analyses of mortuary practices and the demographics of the medieval burial population are compared to contemporaneous sites in medieval Italy, demonstrating that although interments followed broadly Christian patterning across the region, there was considerable diversity in the details of practice at each site.

[70]

Chair

Zori, Colleen [70] see Grimes, Vaughan

#### **Zori, Davide (Baylor University)**

[70]

*The San Giuliano Archaeological Research Project: New Interdisciplinary Archaeology in Central Italy*

This paper introduces the San Giuliano Archaeological Research Project, the focus of this symposium. Our ongoing surveys and excavations at the multicomponent site of San Giuliano (Lazio, Italy) have uncovered a dynamic landscape of interlocking settlement and burial that span the advent of Etruscan civilization to the zenith of the High Middle Ages. We have documented over 500 previously unmapped Etruscan tombs, conducted salvage excavations of four previously looted chamber tombs, and discovered four transitional Villanovan-Etruscan trench tombs dating to around AD 700. Excavations on the plateau have revealed a medieval castle complex, including a feasting hall, a defensive tower, and a crypt with dozens of burials associated with a private chapel. An urban center developed atop the San Giuliano plateau in the seventh century BC, and flourished in the sixth and fifth centuries. After Roman conquest in the third century, people chose to leave the site in favor of dispersed lowland habitation. In the Middle Ages—sometime between AD 800 and 1200—the local population reoccupied and refortified the earlier Etruscan acropolis. Our project seeks to understand the nature and motivations of these settlement shifts.

Zori, Davide [70] see Grimes, Vaughan

#### **Zou, Yuqi (CUHK)**

[78]

*Regional Circulation and Production of Bronze Mirrors in Han Dynasty: Focusing on Guanzhong and Jingzhou Area*

The previous study of Han bronze mirrors was mainly concerned with the diachronic change, such as the overall development in typology and the main component formula. Although there is only one Han bronze mirrors workshop found in North China at present, the regional diversity still deserves further investigation. This paper first presents a comprehensive typology. On this basis, this paper tries to make a large-scale statistics and component analyses of the Han bronze mirrors excavated in the North-South intersection of Guanzhong, Central Plain, and ancient Jingzhou area, in order to explore the differences of the distribution between the North and the South China. In the final part, the issues related to the production management and commodity circulation of the Han Dynasty would be preliminarily discussed.

Zuckerman, Molly [127] see Turner, Bethany

Zuleta, Fernando [11] see McKee, Brian

Zúñiga, Belem [50] see Velazquez, Adrian