

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

## Symposium Abstracts

### **[1] Forum · CLIMATE CHANGE AND THE TRANSFORMATION OF ARCHAEOLOGICAL PRACTICE**

*(PRESIDENT'S FORUM)*

Cultural heritage resources and the community values and scientific information they represent are being damaged or destroyed by the many impacts of climate change. Climate change threatens environments, economies, and communities, and the critical linkages to intangible cultural heritage, such as sense of place, identity, and history. The practice of archaeology is transforming in response to this reality, reframing work environments, methods, and partnerships. This forum explores (1) how archaeologists are developing new methods, including fieldwork adaptation, worker safety, mitigation strategies, curation, and digital preservation; (2) collaborative relationships with descendant and local communities that document, preserve, or mitigate against the loss of cultural heritage to support the transmission of cultural knowledge, tradition, and sovereignty; and (3) necessary political, financial, and industry support for the conditions that climate change poses.

### **[2] Symposium · RECENT ADVANCES IN MATERIAL SOURCING AND PROVENIENCE STUDIES IN AFRICA**

*(SPONSORED BY SOCIETY OF AFRICANIST ARCHAEOLOGISTS)*

Africa preserves the deepest history of raw material exploitation in the world and compositional sourcing techniques have been central to the practice of archaeological science on the continent for over half a century. The goal of this symposium is to bring together a wide range of research into the procurement, movement, and transport of raw materials across the African continent. The papers in this session range from new studies of material procurement in understudied regions, to recent advances in compositional sourcing techniques, to discussions of what provenience and sourcing studies can reveal about the diverse ways people and things have moved across natural and social landscapes through time.

### **[3] General Session · ISOTOPE STUDIES IN THE OLD AND NEW WORLDS PART I**

### **[4] Forum · BACK TO THE FUTURE: THE NATIONAL HISTORIC PRESERVATION ACT AND THE SAA/NPS AIRLIE HOUSE SEMINARS REVISITED PART I**

*(SPONSORED BY SAA PRESIDENT)*

The National Historic Preservation Act of 1966 set the course for archaeology in the United States. The SAA and National Park Service's 1977 *The Management of Archaeological Resources: The Airlie House Report* brought cultural resource management to the forefront and continues to do so. However, as we enter the third decade of the twenty-first century, archaeology is facing new challenges not foreseen in the Airlie House report. In recent years, the profession has changed, guided by technological innovations and social issues such as climate change, environmental justice, the rights of Indigenous and descendant communities, and Traditional Ecological Knowledge. These changes and innovations are affecting how archaeology is practiced today. Furthermore, necessary changes to professional training and a projected shortfall in workforce capacity pose additional challenges. We have urgent work to do to ensure that the federal archaeology program and the discipline reflect and are responsive to these changes. This forum seeks to engage in open dialogue on major topics affecting our profession in the coming decades. Information garnered through discussion in this forum will help facilitate a planning summit scheduled for summer 2023 to address these challenges.

**[5] Forum · FACING CHALLENGES: ZOOARCHAEOLOGY IN A CHANGING WORLD***(SPONSORED BY ZOOARCHAEOLOGY IG)*

This forum brings together zooarchaeologists and taphonomists from low-income countries or involved in research there. This forum is a place to share experiences regarding challenges related to this post-pandemic world as well as the resources that can be used to face some of the issues involved in developing our research (i.e., the access to comparative collections or open data resources). Some of the themes that we want to discuss include the recent closure of traditional zooarchaeology departments, the lack of specific core courses at undergraduate and graduate programs, and the difficult access to permanent job positions. In this changing world, zooarchaeology is not only the study of past human interactions with the environment but also the present and the future. This forum aims to communicate, collaborate, and to create a workflow. Collaborative initiatives could be the key to continue carrying out zooarchaeological research in regards to climate change, inequality, food safety, and culinary identity.

**[6] Symposium · RECENT RESEARCH ON GLASS BEADS AND ORNAMENTS IN NORTH AMERICA**

Glass beads and ornaments in North America have long been used as markers of contact between Indigenous and European communities as well as chronological markers. However, more recent work has expanded research questions to explore how glass ornaments can bring more nuanced understandings of exchange, connectivity, and identity by the diverse peoples who traded, modified, and used these objects. The papers in this session examine glass beads and ornaments from across North America and use a variety of approaches to examine these topics—from the use of compositional techniques to explore the origins and exchange of glass beads—to typological studies that consider how particular types and colors of beads were selected and used.

**[7] General Session · THE ARCHAEOLOGIES OF INDUSTRY****[8] General Session · ARCHAOMETRY AND COMPOSITIONAL ANALYSIS STUDIES PART I****[9] General Session · RITUALS AND BELIEFS: INTERPRETATIONS OF IDEOLOGY THROUGH MATERIAL CULTURE****[10] General Session · ADAPTATION, NEGOTIATION, AND POWER: RECENT STUDIES IN CONTACT AND COLONIALISM PART I****[11] Symposium · THE MOVEMENT OF PEOPLE AND IDEAS IN EASTERN MESOAMERICA DURING THE NINTH AND TENTH CENTURIES CE: A MULTIDISCIPLINARY APPROACH PART I**

For two centuries after the close of the Classic period we know that profound cultural changes swept across Eastern Mesoamerica. What has been harder to ascertain are the vectors of transmission, and the relative importance of migration, commerce, proselytization, and military adventurism in the processes that brought new ideas to the region. This symposium takes a multidisciplinary approach that brings together archaeologists, bioarchaeologists, paleo-geneticists, iconographers, and epigraphers in pursuit of a more holistic understanding of the problem. Gravitating away from familiar but overly fixed dichotomies of ethnic identity, we look for overlaps between research hubs that cover the Gulf Coast, Northern Yucatán, the Central Petén, Belize, and the Pacific highlands reaching down to El Salvador and beyond. Bolstered by new methodologies and pan-regional data surveys, body-anchored approximations will be confronted with data from architecture, artworks, and artifacts. We hereby hope to revitalize discussion about the dynamics of collapse for Classic Maya kingdoms and highlight the various ways in which biological and cultural contacts evolved and many societies prospered after 800 CE, countering the assumptions of hermetically sealed communities in which new cultural concepts float through the ether, rather than being in heads and hands of people on the move.

**[12] Symposium · POLITICAL ECONOMIES ON THE ANDEAN COAST**

From Ecuador to northern Chile, the Andean coast was home to diverse polities that have been studied by both archaeologists and historians. These studies have provided extensive datasets for interpreting coastal political economies, but research often emphasizes models developed for the central Andean highlands. Due to differences in environmental factors and sociopolitical organization between the coast and the highlands, in this session we would like to prioritize data and models from diverse coastal polities. From AD 700 to 1570, the Andean coast was home to a variety of different groups that had distinct political economies, but each polity was shaped to some extent by interactions with other coastal groups and access to marine resources and coastal trade. These topics crosscut a wide range of datasets that include analyses of material culture and studies of Spanish chronicles, census data, and legal documents. In this session we will unite research on currency, value, storage practices, exchange, the organization of craft production, hierarchy, and sociopolitical strategies. Through exploring archaeological and historical research, we hope to better reconstruct broad trends and shifts in coastal Andean political economies and long-distance exchange.

**[13] Symposium · TECHNOLOGICAL TRANSITIONS IN PREHISPANIC AND COLONIAL METALLURGY: RECENT AND ONGOING RESEARCH AT THE ARCHAEOLOGICAL SITE OF JICALÁN VIEJO, IN CENTRAL MICHOACÁN, WEST MEXICO**

Copper and its alloys were the raw materials par excellence for most precolumbian metallurgical industries. In ancient Mesoamerica, copper was not only the predominant metal but also the most amply used base material. When the colonizers assumed control of the local copper industry in the early sixteenth century, it is presumed that they employed native miners and smelters, who for decades carried on the metallurgical techniques that they knew. However, the metallurgists introduced several innovations through the remainder of Spanish dominion, during which time various minerals were extracted from ore. This poster session addresses the preliminary results of the Preindustrial Mining and Metallurgy in Mexico: Research on Copper Smelting in Michoacán project, which focuses on interdisciplinary research at the Postclassic and Colonial site of Jicalán Viejo. Recent and ongoing field and archival investigations and laboratory analyses have allowed us to identify patterns from temporal, spatial, structural, and functional standpoints. This symposium aims to present the above recent investigations and analyses in a public format to a wide audience and to bring together researchers with diverse interests who are contributing to the project.

**[14] Symposium · ARCHAEOLOGICAL CONGRESS: MULTIVOCAL CONVERSATIONS FURTHERING THE WORLD ARCHAEOLOGICAL CONGRESS AGENDA**

The multivocal conversations in this session will advance the core agenda of the World Archaeological Congress, particularly in relation to social justice, Indigenous land rights, and ethical globalization. The session will feature presentations in a conversation format between archaeologists and the various people with whom they work. Conversations will be in person, in real-time via the internet, or pre-recorded. Presentations will discuss themes such as climate change, food security, health and well-being, and Indigenous land rights. The papers in this session will inform the developing agenda for WAC-10, which will be held in Adelaide, Australia, in June 2025.

**[15] Symposium · ARCHAEOLOGY OF ALASKA, THE GATEWAY TO THE AMERICAS**

For decades, research in Alaska has been a cornerstone for our understanding of the late Pleistocene and Holocene peopling of Beringia, Siberia, and the Americas. Recent focus on a period of human isolation, called the Beringian Standstill Hypothesis, for example, has been supported almost entirely by work done in the state. Additionally, regional studies in the state focused on the movement of people and technologies during the Holocene encompassing sites from areas as large as most states. This session includes papers dedicated to current studies in Alaska with emphasis on prehistory, paleoecology, and human-environment interaction.

**[16] Symposium · LIVING LANDSCAPES: DISASTER, MEMORY, AND CHANGE IN DYNAMIC ENVIRONMENTS**

Throughout time, humans around the world engaged with, adapted to, and exacerbated environmental changes to sustain livelihood and create meaningful relationships with place. Through a global perspective, this session employs an understanding of Landscape as an active, social, and physical process, to explore how

past societies make, respond to, and transform dynamic landscapes through time. We explore the relationship between landscapes and memory, while readdressing the definition of dynamic landscapes. Dynamic landscapes have often been associated with environmental changes and human modifications that impact the physical characteristics of an area. These spaces are not only reflected in the material world but are also manifested within memory or knowledge of the individuals and communities that live in them. We acknowledge that environmental change can be rapid, gradual, disastrous, beneficial, and a product of physical or social factors. We also acknowledge that impacts of environmental change and landscape transformation are not always equally experienced across societies. Both landscapes and the memories of people who live in these landscapes are dynamic; they are built through periods of both stability and instability. Through archaeological methods, we can study what makes dynamic places meaningful through lasting legacies and changes in the past.

**[17] Symposium · 2023 FRYXELL AWARD SYMPOSIUM: PAPERS IN HONOR OF TIMOTHY BEACH PART I**

*(SPONSORED BY SPONSORED BY THE FRYXELL AWARD COMMITTEE)*

The 2023 Fryxell Award for Earth Sciences scholarship is awarded to Dr. Timothy P. Beach, Professor and C. B. Smith Sr. Centennial Chair in the Department of Geography and the Environment at the University of Texas at Austin. The 2023 Fryxell Award is presented in the Earth Sciences category due to the generous support of the family of the late, great geologist Roald Fryxell, who built his career on the interdisciplinary importance of the geological sciences in archaeology. This symposium, organized as part of the award, brings together a group of scholars working in diverse regions and fields but all with a common goal of advancing archaeology through a rigorous earth science focus. Here we celebrate Tim Beach's distinguished and ongoing research career. Tim Beach is an accomplished geoarchaeologist and his research focuses on the reconstruction of past land-use patterns, agriculture, and human-environmental interaction over many temporal scales using many methods. He has worked most recently on using innovative geoarchaeological techniques in the Maya Lowlands, but Tim's talent is not contained to one region or method. To compliment and honor Tim's ongoing work, we showcase advances in our shared discipline related to geoarchaeology, soils, geochemistry, and remote sensing science.

**[18] Symposium · PUBLIC LANDS, PUBLIC SITES: RESEARCH, ENGAGEMENT, AND COLLABORATION**

*(SPONSORED BY PUBLIC ARCHAEOLOGY INTEREST GROUP)*

Some of the most significant archaeological sites in the United States and abroad are located on public land. Professionals who work with these federal, state, and local entities find their time divided among a staggering number of responsibilities and stakeholders. While the management, stewardship, and interpretation of the buried past isn't always prioritized within these organizations, unique opportunities for preservation, connection, and exploration abound. This symposium will highlight projects conducted in a variety of taxpayer-funded agencies, some with long traditions of archaeology and some just getting off the ground. The goals of the session, sponsored by the SAA Public Archaeology Interest Group, include highlighting best practices and approaches to public lands archaeology and emphasizing the importance of these sites and projects for descendant communities, natural and cultural resource managers, and the citizens who own the land.

**[19] Symposium · DEDICATION, COLLABORATION, AND VISION PART I: PAPERS IN HONOR OF TOM D. DILLEHAY**

This symposium celebrates the career of Tom D. Dillehay and his impactful contributions to interdisciplinary anthropology and South American archaeology. From meticulously researched archaeological studies that transformed our understanding of early humans in the Americas to interdisciplinary historical investigations of colonialism and commitment to ethical ethnographic research among modern Indigenous communities, Tom's career is a trailblazing example of an anthropological archaeologist. His broad research addresses issues of settlement, migration, interaction, identity, environmental transformation, agriculture, and development of complex societies in the Indigenous Americas, including in South America, the USA, and Mexico. Moreover, Tom has held professional appointments in 19 institutions across Latin America, where

he has not only taught generations of archaeology students but also founded three departments of anthropology. In this two-part session, Tom's former students and mentees (Part 1) and colleagues and collaborators (Part 2) discuss the influence of his extraordinary career on their scholarship or the discipline at large, as well as showcase regionally and thematically diverse papers that honor his career. All presentations connect to Tom's tireless and ongoing pursuit of understanding how pre-complex and complex societies emerged, what propels social change, and how archaeology contributes key anthropological insights vis-à-vis interdisciplinary, collaborative, and theoretically grounded research.

**[20] Symposium · SUBSISTENCE CROPS AND ANIMALS AS A PROXY FOR HUMAN CULTURAL PRACTICE**

Agroecological systems can be thought of across three dimensions: (1) plant and human biology, (2) the local biotic and abiotic community, and (3) human cultural practice. Modern agroecological systems are the result of millennia of negotiations between human practices, population biology, and environmental conformation. Archaeological practices allow us to observe these processes over time and space using landscape approaches to understand management practices and past environments, stylistic analysis to inform cultural understanding, and ancient DNA to interrogate biological changes as these systems developed.

**[21] General Session · ARCHAEOLOGICAL STUDIES OF LITHICS PART I**

**[22] Symposium · THINKING BIG IN THE ANDES: PAPERS IN HONOR OF CHARLES STANISH**

This session celebrates the deep impact of Dr. Charles (Chip) Stanish on archaeology in and beyond the Andes. His empirical and wide-ranging research illuminates the development of social complexity and the construction of wealth, ritual authority, and large cooperative networks under specific regimes of trade, agriculture, and conflict. From his University of Chicago dissertation in the upper Moquegua valley and his decades of pathbreaking research in the Titicaca Basin to his major advances in the Chincha valley, he has addressed the Andean sequence from Paracas to Inca, and shed light on processes that resonate far beyond the Andes. Currently executive director of the Institute for the Advanced Study of Culture and the Environment (USF), Dr. Stanish was director of UCLA's Cotsen Institute of Archaeology (2001–2016), and previously curator and anthropology chair at the Field Museum. The author of five books, multiple edited books, and scores of articles, he has won recognition as a member of the National Academy of Sciences and the American Academy of Arts and Sciences, among other honors. Above all, his infectious curiosity, brilliance, boundless energy, and big heart have touched and inspired legions of students and colleagues. These papers recognize his influence and honor his contributions.

**[23] Symposium · MULTISPECIES FRAMEWORKS IN ARCHAEOLOGICAL INTERPRETATION: HUMAN-NONHUMAN INTERACTIONS IN THE PAST PART I**  
(SPONSORED BY AMERICAN ANTHROPOLOGICAL ASSOCIATION (AAA) ARCHAEOLOGICAL DIVISION)

Archaeologists have long espoused interpretive approaches that illuminate the agency of human actors in the past. This session aims to deconstruct the centrality of humans within our narratives by considering the ways that other-than-human beings were integral in shaping practice and ideology across the world. Multispecies archaeology has recently become an important way of reorienting approaches to subsistence practices, herding lifeways, landscape transformations, settlement histories, and interregional interaction. By examining the interactions and entanglements of different, possibly multiple, species that form parts of foodways, modes of transportation, and ways of being on a landscape, we will explore how diverse species that may have held distinct value for past societies impacted and transformed daily and long-term activities. Multispecies frameworks contend that the primacy of human agency obscures heterarchical relationships within ecologies and the world at large. Participants in this session are encouraged to consider plants, animals, and other beings including the broader environment as agentive forces that constrained, afforded, and shaped human lifeways and beliefs. Theoretical and methodological perspectives may include posthumanism, osteobiography, kincentric ecologies, ethnography, paleoethnobotany, zooarchaeology, landscapes, and biomolecular approaches, among many others.

**[24] Symposium · BEYOND “BARBARIANS”: DIMENSIONS OF MILITARY ORGANIZATION AT THE BLEEDING EDGE OF THE PREMODERN STATE**

This session will problematize and theorize dimensions of military organization in non-state and state-adjacent societies. The groups that we focus on include Viking raiders, Iroquoian war parties, German tribal polities during the Roman period, and other large-scale military formations “on the move.” These may “belong,” derive from, or be affiliated in some way with distinct polities but is not necessary. We are interested in comparing their makeup and structure (in a fairly open way), and also where relevant to consider how they either precipitate the formation of or transform themselves into new polities. Questions to be considered include: How does the organization and direction of militarized groups develop outside of the centralizing tendencies of states and vertically integrated societies? To what degree was the organizational and institutional basis of militarized groups integrated with or independent of territorial polities, and to what extent might militarized groups have constituted polities in their own right? How were they financed and supported, and in what ways did “warrior” identity articulate with prevailing cultural, political, religious, or ideological norms? And, finally, what role did these groups play in driving developments in the world-systems in which they were enmeshed but perhaps not recognized as full-fledged participants?

**[25] General Session · USING SPACE, MAKING PLACE: LANDSCAPE ARCHAEOLOGIES PART I**

**[26] Poster Session · ARCHITECTURE AND URBAN ARCHAEOLOGY**

**[27] Poster Session · VARIED APPROACHES TO CERAMIC ANALYSIS AROUND THE WORLD**

**[28] Poster Session · ARTS AND CRAFTS: ARTISTIC EXPRESSION, ICONOGRAPHY, AND CRAFT PRODUCTION**

**[29] Poster Session · WHAT'S ON THE MENU? PART I: ISOTOPE ANALYSIS**

**[30] Poster Session · THE ARCHAEOLOGY OF CONFLICTS AND THEIR AFTERMATH**

**[31] Forum · BACK TO THE FUTURE: THE NATIONAL HISTORIC PRESERVATION ACT AND THE SAA/NPS AIRLIE HOUSE SEMINARS REVISITED PART II**  
(SPONSORED BY SAA PRESIDENT)

The National Historic Preservation Act of 1966 set the course for archaeology in the United States. The SAA and National Park Service’s 1977 *The Management of Archaeological Resources: The Airlie House Report* brought cultural resource management to the forefront and continues to do so. However, as we enter the third decade of the twenty-first century, archaeology is facing new challenges not foreseen in the Airlie House report. In recent years, the profession has changed, guided by technological innovations and social issues such as climate change, environmental justice, the rights of Indigenous and descendant communities, and Traditional Ecological Knowledge. These changes and innovations are affecting how archaeology is practiced today. Furthermore, necessary changes to professional training and a projected shortfall in workforce capacity pose additional challenges. We have urgent work to do to ensure that the federal archaeology program and the discipline reflect and are responsive to these changes. This forum seeks to engage in open dialogue on major topics affecting our profession in the coming decades. Information garnered through discussion in this forum will help facilitate a planning summit scheduled for summer 2023 to address these challenges.

**[32] Forum · CONNECTING THROUGH A FRAMEWORK ON THE RIGHTS OF INDIGENOUS PEOPLES**

The UN Declaration on the Rights of Indigenous Peoples (UNDRIP) establishes a framework of standards for the survival, dignity, and well-being of Indigenous peoples. This session will demonstrate how the tenets of UNDRIP can be applied in cultural heritage efforts to give primacy of voice to Indigenous communities.

Projects create change within institutions to emphasize the rights of Indigenous peoples to maintain and strengthen their own cultures and traditions. Our presenters will contextualize these rights to practice, revitalize, access, use, and protect tangible and non-tangible forms of cultural heritage within their respective organizations and projects. These changes build lasting and meaningful relationships to engage diverse cultures and values. These projects activate the voice of source communities and reconnect those communities to their heritage. The rights of Indigenous peoples will be contextualized within a tribal museum. This model is expanded by our presenters to demonstrate how non-tribal facilities implement programs that prioritize Indigenous voices and values. Our profession can change from within by setting forth tools that enable us to move confidently in the direction of decolonizing and sensitizing practices, enabling connection with descendant communities for more meaningful, relevant, and culturally sensitive documentation and interpretation.

**[33] Symposium · VARIABILITY: A REASSESSMENT OF ITS MEANING, AFFORDED RANGE, AND THE RELATION TO PROCESS**

Interpretations of emerged variability in the paleo-archaeological record often presuppose a plurality within the underlying process, be that process related to demography, cultural transmission, or a landscape-use behavior. We take by default the differences in, for example, frequencies of the same artifact attributes and faunal elements between sampled locations to represent different social groups and place uses. Calls for attention to the emergence of variability have already been made (e.g., G. Isaac's "random walk patterning"), but the prevailing practice of regarding data as central tendencies themselves is ignoring the likelihood that, in the simplest terms, a single operating process can result in a broad range of variability or, conversely, that the same or limited variability can be the result of a number of different processes. The aim of this session is to reassess the meaning of emerged variability and its relation to a process or to interaction of processes. We will discuss how variability can become "afforded" by various factors forming the record: the properties of the raw material; functional and economic contingencies of tools, actions, and subsistence strategies; parameters of cultural transmission; but also by our own sampling and excavation strategies and accumulative life-histories of places, objects, and materials.

**[34] Symposium · THE MAYA WALL PAINTINGS OF CHAJUL (GUATEMALA)**

This panel proposal presents the results of the interdisciplinary research of the murals of Chajul, an Ixil Maya town located in highland Guatemala. Different phases of this project were carried out by the Jagiellonian University in Krakow between 2019 and 2022, and included conservation and scanning of the walls in three adobe houses, archaeological excavation, and pigment analysis, as well as ethnographic and ethnomusicological fieldwork. The paintings in different stages of preservation can be observed in over 10 houses in Chajul; they are also recorded in oral history. They constitute an exquisite example of indigenous art of the Americas, especially that such mural paintings in the colonial setting were typically seen in contexts associated almost exclusively to Catholic sacral architecture. The iconography of the murals reveals interesting details such as human figures in rich attires, musicians, and animals and hunting motifs. These elements direct to interpretations associated with the performance of dance-dramas, religious sodalities activity, ceremonies, and feasts dedicated to the figures of saints. The panel will also present results of recent archaeological excavations associated with colonial houses with murals from Chajul.

**[35] Symposium · PACIFIC MARITIME HISTORY: SHIPS AND SHIPWRECKS**

This symposium brings together papers on topics of maritime history, including the shipbuilding traditions of postcontact Hawaii, Pacific Northwest Native maritime technology, and prehistoric shipwrecks and exploration of the Northwest Coast.

**[36] Symposium · THE ARCHAEOLOGY OF TROPICAL MONTANE CLOUD FORESTS**

The unique ecologies of Tropical Montane Cloud Forests (TMCf) throughout the Americas have impacted the human cultures to which they are home from initial human colonization to the present. Decades of research have contributed to understanding these environments biologically, yet they often remain understudied archaeologically. This organized session aims to bring a comparative approach to the study of TMCfs, exploring how human-environment interactions within various tropical and subtropical cloud forests

in Latin America have influenced past human populations and cultures, as well as the development of archaeological practice within these regions. This symposium brings together a number of papers exploring archaeology in tropical cloud forests, including social, political, and economic complexity; identity construction; paleoecology; environmental change; subsistence practices; and resilience. Regional contributions include scholarship from Peru, Ecuador, Costa Rica, Mexico, etc. A comparative perspective on archaeology in such regions can greatly enhance our knowledge about human-environment interactions in Tropical Montane Cloud Forests, including implications for conservation of these fragile ecosystems today.

**[37] Symposium · THE SECOND-OLDEST SITES IN THE PACIFIC NORTHWEST**

The oldest archaeological sites in the Pacific Northwest like Paisley Caves and Cooper's Ferry get a lot of well-deserved attention. However, there are slightly younger or less studied sites that are underreported in the scientific literature. When viewed together, these lesser-known sites add important details to our understanding of how people lived in the late Pleistocene and early Holocene. This symposium brings together recent archaeological research from across the Pacific Northwest to build a richer picture of life during the transition out of the Pleistocene.

**[38] Forum · DIALOGUES ON COLLABORATIVE ARCHAEOLOGY IN US NATIONAL PARKS**

The US National Park Service's dual mission embraces both the preservation of archaeological resources and the cooperation of partners, making parks prime settings for collaborative archaeology. Parks and soon-to-be parks welcome invested and descendant communities to get involved in archaeological, archival, and oral history projects documenting their stories. The strong relationships resulting from collaborative archaeology enable parks and communities to share the stewardship of archaeological resources in creative and effective ways. For instance, archaeology performed in collaboration with stakeholders builds critical support for heritage sites as they strive for greater recognition, including park status. This forum brings together discussants engaging with communities through archaeology in parks or soon-to-be parks to learn from one another's experiences in the development and running of collaborative projects for the long term. The forum should benefit anyone interested in pursuing or improving collaborative archaeology in the National Park System or other publicly accessible heritage sites.

**[39] Forum · ARCHAEOLOGICAL CONGRESS PART II: THE IMPORTANCE OF BEING EARNEST**

Participants will engage in a frank discussion of the pitfalls of attempting engaged archaeology. This forum is conceived as an addendum to Session 5649 chaired by Claire E. Smith, PhD, entitled "Archaeological Congress: Multivocal Conversations Furthering the World Archaeological Congress Agenda, Part I." The forum will afford interested parties the opportunity for further discussion.

**[40] Forum · FAKING IT AND MAKING IT: ENGAGING WITH POP CULTURE THREATS TO ARCHAEOLOGY**

With the popularity of TV series such as *Ancient Aliens* on History and *Ancient Apocalypse* on Netflix and websites and discussion groups such as *Ancient Origins*, pseudoarchaeology has an ongoing influence on the world. Whether directly or indirectly, it affects our reputations, employment, salaries, teaching, research, and public engagement. Its effects have intensified with general anti-science and conspiracy-theory rhetoric, dangerously reinforcing racism, nationalist extremism, and white supremacy. It may always be with us. Pseudoarchaeology proliferates in blogs, social media, podcasts, online videos, and documentary films, but these are also significant public forums. Ongoing interaction through classroom teaching and academic publications and outreach in the context of nonacademic employment are not enough. While archaeologists are well-positioned to address popular misconceptions, it is essential to understand how to weather the hassles, risks, and dangers of malicious actors. We must address pseudoarchaeology in diverse ways, from a solid base of knowledge and experience, using skills of effective communication as well as critical thinking. This forum brings together a range of experienced archaeologists from a variety of backgrounds to discuss hazards, resources, and strategies for effective engagement with the public.

**[41] Poster Session · ROCK HARD SCIENCE: LITHICS ANALYSIS PART I****[42] Poster Session · ROCK HARD SCIENCE: LITHICS ANALYSIS PART II****[43] Poster Session · WHAT'S ON THE MENU? PART II: BOTANICAL ANALYSIS****[44] Poster Session · IT'S NOT ALL ANCIENT HISTORY: MUSEUMS RESEARCH AND HISTORICAL ARCHAEOLOGY****[45] Poster Session · MIGRATION, MOVEMENT, AND TRADE NETWORKS****[46] General Session · USING SPACE, MAKING PLACE: LANDSCAPE ARCHAEOLOGIES PART II****[47] Symposium · RECENT RESEARCH ON THE PALEOLITHIC IN THE MEDITERRANEAN REGION**

Recent decades have seen a rise in research into Paleolithic sites and samples in the Mediterranean region. Yet there remain many unknowns. Climatic fluctuations and related changes in the sea level during the Pleistocene affected this region even more than most inland sites. The resulting changes in floral and faunal communities created additional pressures on hunter-gatherers, causing dynamic patterns of human adaptation and behavior. The aim of this symposium is to provide an update on recent research on the Paleolithic in various regions of the Mediterranean, thus enabling a better insight into behavioral patterns of Pleistocene groups in their temporal and geographic distribution, including hunting strategies, mobility patterns, contact zones, and site use.

**[48] Symposium · ISOTOPIC AND ANIMAL ADNA ANALYSES IN THE SOUTHWEST/NORTHWEST**

There is a long history of applying “hard science” techniques to the archaeology of the Southwest/Northwest, with transformational results. Dendrochronology, radiocarbon dating, archaeomagnetic dating, and a variety of methods of provenance analysis used to address ceramics and stone artifacts have refined the chronologies of our models of past processes and illuminated ancient networks. Recently, studies focused on stable isotope data derived from animal bones and shells, as well as trees used as construction timbers, have revealed complementary and sometimes unexpected patterns at local, regional, and interregional scales. Research on DNA recovered from archaeological fauna has also yielded critical insights. Data resulting from work with the remains of many animals (including turkeys, macaws, dogs, bighorn sheep, deer, marine mollusks, and cattle) and plants (including trees, shrubs, and corn) have been used to model ancient migrations (using animals as proxies for humans), document and better understand domestication, demonstrate relationships among different ancient groups, explore livestock management practices, define procurement areas, and trace changes in resource use associated with the Entrada. This group of papers consists of case studies intended to provide a glimpse of the state-of-the-art in terms of applying these techniques to key research questions in Southwest/Northwest archaeology.

**[49] General Session · ONE IF BY LAND, TWO IF BY SEA: UNDERWATER, ISLAND, AND SHORELINE ARCHAEOLOGIES PART I****[50] General Session · ARCHAEOLOGIES OF SEEING, HEARING, EXPERIENCING****[51] Symposium · MULTISPECIES FRAMEWORKS IN ARCHAEOLOGICAL INTERPRETATION: HUMAN-NONHUMAN INTERACTIONS IN THE PAST PART II**  
(SPONSORED BY AMERICAN ANTHROPOLOGICAL ASSOCIATION (AAA) ARCHAEOLOGICAL DIVISION)

Archaeologists have long espoused interpretive approaches that illuminate the agency of human actors in the past. This session aims to deconstruct the centrality of humans within our narratives by considering the ways that other-than-human beings were integral in shaping practice and ideology across the world. Multispecies

archaeology has recently become an important way of reorienting approaches to subsistence practices, herding lifeways, landscape transformations, settlement histories, and interregional interaction. By examining the interactions and entanglements of different, possibly multiple species that form parts of foodways, modes of transportation, and ways of being on a landscape, we will explore how diverse species that may have held distinct value for past societies impacted and transformed daily and long-term activities. Multispecies frameworks contend that the primacy of human agency obscures heterarchical relationships within ecologies and the world at large. Participants in this session are encouraged to consider plants, animals, and other beings including the broader environment as agentive forces that constrained, afforded, and shaped human lifeways and beliefs. Theoretical and methodological perspectives may include posthumanism, osteobiography, kincentric ecologies, ethnography, paleoethnobotany, zooarchaeology, landscapes, and biomolecular approaches, among many others.

**[52] Symposium · THE ROLE OF WOMEN IN MESOAMERICAN RITUAL**

Ritual practice is a multisensory experience that calls on higher powers, spirits, or ancestors to intercede favorably in the lives of the practitioner. Ritual reverberates through all facets of life in Mesoamerica, a region with a rich record of ethnographic, historic, and archaeological data detailing the diversity of rituals embodied in daily religious practice. Yet like so many other facets of research in Mesoamerica, men receive the attention of investigators who resultantly place women in subsidiary roles or omit them from narratives all together. This session compiles evidentiary support that validates the vital role women played in ancestral and contemporary Mesoamerican rituals. Presenters discuss the religious practices women performed at home and in extravagant tombs, family shrines, sweat baths, and present-day cofradia houses. The women figured as the protagonists of these papers span from royal women to agrarian mothers and employ varied ritual toolkits encompassing brooms, figurines, spindle whorls, metates, textiles, sculpture, water, and flowers. Without a greater understanding of women-led or women-focused rituals, researchers will continue to distort essential aspects of Mesoamerican religious life.

**[53] Symposium · NORTHEAST ASIAN PREHISTORIC HUNTER-GATHER LIFEWAYS: MULTIDISCIPLINARY, INDIVIDUAL LIFE HISTORY APPROACH**

This symposium will feature the research of the Baikal Archaeology Project (BAP), an international and multidisciplinary team of scholars investigating Middle Holocene hunter-gatherer culture dynamics. The BAP is rooted in the bioarchaeology of individual life histories approach and provides a unique theoretical perspective and rich empirical data to address the dynamism, variability, and resilience of prehistoric Holocene hunter-gatherers. The BAP focuses on an intensive comparative analysis of two long-term regional trajectories of Holocene hunter-gather culture change (ca. 9,000–3,000 years ago): the Lake Baikal region (Siberia) and Karelia (northeast Europe). The international team of BAP scholars possesses a range of expertise in archaeology, osteology, bioarchaeology, chronology, genetics, paleoenvironmental studies, spatial analysis of multiple isotopic proxies, and ethnography, to comprehensively examine multiple aspects of hunter-gatherer population level and individual life histories. The insights from these synthesized results and ongoing research will promote a greater appreciation for the dynamic pattern of hunter-gatherer cultural variability, both spatially and temporally.

**[54] Symposium · 2023 FRYXELL AWARD SYMPOSIUM: PAPERS IN HONOR OF TIMOTHY BEACH PART II**

*(SPONSORED BY FRYXELL AWARD COMMITTEE AND THE GEOARCHAEOLOGY SPECIALTY GROUP)*

The 2023 Fryxell Award for Earth Sciences scholarship is awarded to Dr. Timothy P. Beach, Professor and C. B. Smith Sr. Centennial Chair in the Department of Geography and the Environment at the University of Texas at Austin. The 2023 Fryxell Award is presented in the Earth Sciences category due to the generous support of the family of the late, great, geologist Roald Fryxell, who built his career on the interdisciplinary importance of the geological sciences in archaeology. This symposium, organized as part of the award, brings together a group of scholars working in diverse regions and fields, but all with a common goal of advancing archaeology through a rigorous earth science focus. Here we celebrate Tim Beach's distinguished and ongoing research career. Tim Beach is an accomplished geoarchaeologist and his research focuses on the reconstruction of past land-use patterns, agriculture, and human-environmental interaction over many

temporal scales using many methods. He has worked most recently on using innovative geoarchaeological techniques in the Maya Lowlands, but Tim's talent is not contained to one region or method. To compliment and honor Tim's ongoing work, we showcase advances in our shared discipline related to geoarchaeology, soils, geochemistry, and remote sensing science.

**[55] General Session · MUTUALLY BENEFICIAL: TECHNOLOGIES IN ARCHAEOLOGICAL APPLICATION AND ARCHAEOLOGIES IN TECHNOLOGICAL APPLICATION PART I**

**[56] Symposium · PLEISTOCENE LANDSCAPES AND HOMININ BEHAVIOR IN THE ARMENIAN HIGHLANDS**

The Armenian Highlands is a significant location for our interpretations of hominin dispersals and behavioral diversity, not least because of its position between the Levant and Eurasia. Prior to the late twentieth century, our understanding of Pleistocene archaeology in this region was hindered by a research emphasis on later periods, few stratified sites, and a dearth of chronometric dating. However, over the last 30 years there has been remarkable growth in the number and quality of international collaborative programs that have greatly expanded our geological and archaeological understanding of the region. In this symposium, discussions will explore new and ongoing investigations related to Pleistocene landscape formation, paleoenvironments, geochronology, and hominin behavior. This interdisciplinary research incorporates data and views from international teams with wide-ranging interests and specialties. With talks spanning the entire Pleistocene, this session has value for scholars in neighboring regions seeking to understand Lower, Middle, and Upper Paleolithic interregional dynamics.

**[57] Symposium · UNSETTLING INFRASTRUCTURE: THEORIZING INFRASTRUCTURE AND BIOPOLITICAL ECOLOGIES IN A MORE-THAN-HUMAN WORLD**

Following recent work like that of Tsing et al. (2021), this session explores "infrastructures" as assemblages of humans, more-than-human entities, and broader ecologies. Infrastructures sometimes produce broad systems of inequality and segregation, routes of connection and community, and/or leave various forms of devastation and ruination in their wake. We welcome contributions broadly relating to the impacts and consequences of diverse forms of infrastructure through time and across the globe, including railroads, highways, and roads, shipping routes, mines and sites of extraction, animal herding, pipelines, boom towns, plantation and post-plantation landscapes, and the biopolitical consequences of state infrastructural divestment, etc. Drawing on diverse theoretical contributions, this session attempts a deeper archaeological theorization of infrastructures and related ecologies. How do environments and other-than-human actors impact infrastructural projects and vice versa? What sorts of methodologies and questions can archaeologists bring to this topic? What are the sociopolitical implications and possibilities of our work in exposing these processes?

**[58] Symposium · THE MOVEMENT OF PEOPLE AND IDEAS IN EASTERN MESOAMERICA DURING THE NINTH AND TENTH CENTURIES CE: A MULTIDISCIPLINARY APPROACH PART II**

For two centuries after the close of the Classic period we know that profound cultural changes swept across eastern Mesoamerica. What has been harder to ascertain are the vectors of transmission, and the relative importance of migration, commerce, proselytization, and military adventurism in the processes that brought new ideas to the region. This symposium takes a multidisciplinary approach that brings together archaeologists, bioarchaeologists, paleo-geneticists, iconographers, and epigraphers in pursuit of a more holistic understanding of the problem. Gravitating away from familiar but overly fixed dichotomies of ethnic identity, we look for overlaps between research hubs that cover the Gulf Coast, Northern Yucatán, the Central Petén, Belize, and the Pacific highlands reaching down to El Salvador and beyond. Bolstered by new methodologies and pan-regional data surveys, body-anchored approximations will be confronted with data from architecture, artworks, and artifacts. We hereby hope to revitalize discussion about the dynamics of collapse for Classic Maya kingdoms and highlight the various ways in which biological and cultural contacts evolved and many societies prospered after 800 CE, countering the assumptions of hermetically sealed

communities in which new cultural concepts float through the ether, rather than being in heads and hands of people on the move.

### **[59] Symposium · ANDEAN AND AMAZONIAN CERAMICS: ADVANCES IN TECHNOLOGICAL STUDIES**

In the Andean and Amazonian regions, ceramic studies play a prominent role in the definition of ancient societies and their relationships, although a large part of this research was mainly focused on typological studies to build the current chronocultural sequences. Nonetheless, over the last decades ceramic technological studies have become more and more significant and now encompass a wide range of approaches such as archaeometric analyses to determine the composition of pastes and pigments, and the provenance of the materials; experimental research and ethnoarchaeological studies to create comparative frames of reference; or works based on the study of the macroscopic and microscopic traces of manufacture to define the methods and techniques of shaping. But what these analyses have in common is their attempt to switch from a more traditional morphostylistic description of pottery to an understanding of the identity of potters and the social, economic, cultural, and political contexts in which they were involved. This session brings together experts in Andean and Amazonian ceramic technology to discuss research and recent advances in this field and account for the diversity of theoretical and methodological approaches and the sociocultural issues that can be addressed from these studies.

### **[60] Symposium · ESSENTIAL CONTRIBUTIONS FROM AFRICAN TO GLOBAL ARCHAEOLOGY**

Archaeology throughout the African continent in the last few decades has provided important insights into questions that are relevant to archaeology worldwide. Yet, these new theoretical perspectives and datasets have not been widely incorporated into scholarship elsewhere in the world, perhaps a latent effect of lingering colonialist perspectives, and consequently have not played prominently in global archaeological debates. This session aims to correct this situation by highlighting the ways that Africanist scholarship pushes forward debates on a variety of important topics, including but not limited to Indigenous archaeologies, domestication of plants and animals, egalitarianism and inequality, the practice of archaeology, complexity and urbanism, site formation processes, histories of technology, religion, and political process. It will bring together scholars working in Africa with those working elsewhere to explore thematic and theoretical connections and identify new directions that emerge from these dialogues.

### **[61] Symposium · DEDICATION, COLLABORATION, AND VISION PART II: PAPERS IN HONOR OF TOM D. DILLEHAY**

This symposium celebrates the career of Tom D. Dillehay and his impactful contributions to interdisciplinary anthropology and South American archaeology. From meticulously researched archaeological studies that transformed our understanding of early humans in the Americas to interdisciplinary historical investigations of colonialism and commitment to ethical ethnographic research among modern Indigenous communities, Tom's career is a trailblazing example of an anthropological archaeologist. His broad research addresses issues of settlement, migration, interaction, identity, environmental transformation, agriculture, and development of complex societies in the Indigenous Americas, including in South America, the USA, and Mexico. Moreover, Tom has held professional appointments in 19 institutions across Latin America, where he has not only taught generations of archaeology students but also founded three departments of anthropology. In this two-part session, Tom's former students and mentees (Part 1) and colleagues and collaborators (Part 2) discuss the influence of his extraordinary career on their scholarship or the discipline at large, as well as showcase regionally and thematically diverse papers that honor his career. All presentations connect to Tom's tireless and ongoing pursuit of understanding how pre-complex and complex societies emerged, what propels social change, and how archaeology contributes key anthropological insights vis-à-vis interdisciplinary, collaborative, and theoretically grounded research.

**[62] Symposium · FUTURE DIRECTIONS FOR ARCHAEOLOGY AND HERITAGE RESEARCH IN THE WILLAMETTE VALLEY, OREGON**

The Willamette Valley of western Oregon is a unique geographic region shaped by millennia of Native American land management practices, including the use of fire to enhance and sustain the Valley's prairie habitats and oak savannas. Historic and current industrial, agricultural, and urban development have further altered the landscape; these changes also drive a significant volume of cultural resource management activity in the Willamette Valley. Despite this, the region is rarely a focal point for archaeological research. This session aims to bring together a broad group of researchers, cultural resource management practitioners, and Tribal experts working in the region to share current work, identify knowledge gaps, and to discuss future directions for research focused on the Willamette Valley.

**[63] General Session · NOT-SO-ODD BEDFELLOWS: CLIMATE CHANGE AND ARCHAEOLOGY****[64] General Session · IN FLUX: SETTLEMENT PATTERN STUDIES IN ARCHAEOLOGY PART I****[65] General Session · EDUCATION, ETHICS, AND ENDLESS SHELVES: STUDIES IN ARCHAEOLOGICAL COLLECTIONS, CURATION, AND MUSEUMS PART I****[66] General Session · TRACKING POPULATIONS, RESOURCES, AND KNOWLEDGE ACROSS SPACE AND TIME PART I****[67] Symposium · POPULATIONS OF EARLY MEDIEVAL CHINA: DEVELOPING ANTHROPOLOGICAL APPROACHES TO HISTORICAL ARCHAEOLOGY IN CHINA**

The archaeology of China has been both helped and hindered by the presence of historical records that stretch back in an "unbroken" continuity of scholarship for over 2,000 years. This means that Chinese archaeology in the historical period has a strong tendency to exist within the strictures of recorded history. The papers in this session use techniques such as archaeobotany, zooarchaeology, urban archaeology, and landscape archaeology to study the traces of the vast majority of the population of historical China who are absent from the official recorded histories.

**[68] General Session · ARCHAEOLOGICAL STUDIES OF HUMAN-ENVIRONMENT RELATIONSHIPS PART I****[69] Poster Session · DIGITAL ARCHAEOLOGY IN 3D: PHOTOGRAMMETRY AND OTHER 3D MODELING TECHNIQUES****[70] Poster Session · FRIENDS NOT FOOD: HUMAN AND ANIMAL INTERACTIONS BEYOND HUMAN DIET PART I****[71] Poster Session · FRIENDS NOT FOOD: HUMAN AND ANIMAL INTERACTIONS BEYOND HUMAN DIET PART II****[72] Poster Session · TO THE RESCUE ARCHAEOLOGY: CRM AND HERITAGE MANAGEMENT****[73] Poster Session · GIS AND SPATIAL ANALYSIS PART II****[74] Poster Session · NO NOT TINDER: DATING METHODS AND CHRONOLOGICAL MODELING****[75] Poster Session · GIS AND SPATIAL ANALYSIS PART I**

**[76] Poster Session · STABILITY AND RESILIENCE IN ZOOARCHAEOLOGY***(SPONSORED BY ZOOARCHAEOLOGY INTEREST GROUP)*

How communities generate stability and resilience against disturbance has received increasing archaeological attention in recent years. Zooarchaeologists are in a prime position to broadly study resilience and the maintenance of stability, given their focus on how human and nonhuman animal communities integrate with one another through time. Animals, and their byproducts, act as a rich proxy toward understanding economic systems and subsistence practices to reveal past adaptation, resiliency, and stability, including failed stability (collapse). The goal of this poster session is to showcase recent zooarchaeological perspectives and work on stability and resilience in different parts of the globe, at different times, and with different methodological approaches.

**[77] General Session · USING SPACE, MAKING PLACE: LANDSCAPE ARCHAEOLOGIES PART III****[78] Forum · REVISION TO THE SAA'S PRINCIPLES OF ARCHAEOLOGICAL ETHICS: MEMBERSHIP INPUT***(SPONSORED BY SAA BOARD OF DIRECTORS)*

This forum is designed to solicit comments from the membership, including international members, on a draft revision of SAA's Principles of Archaeological Ethics. The draft revision was emailed to all members (current of March 1, 2023) prior to the annual meeting, and copies will be available at the forum. Comments received at the forum as well as those received by the SAA will be considered to craft the final version of the draft principles to be submitted for approval to the SAA Board of Directors. The effort to revise the ethical principles began in 2018 and has involved the work of three successive task forces. This draft represents the first major revision to the principles since they were adopted in 1996.

**[79] Symposium · ARCHAEOLOGY OF MEDIEVAL EURASIAN STEPPE URBANISM**

This collection of papers highlights the state of the art in the study of the archaeology of Eurasian medieval urbanism. The field has moved beyond simple recognition to that there is such a thing as cities in the grasslands of nomads, to examining these central places in detail and, in many cases, surpassing previous historical sources in detail and depth. Many research projects have enriched our understanding of steppe empires, the interaction of mobile and sedentary populations, networks, and state building. Together they are piecing together the story of steppe urbanism, covering a period of a thousand years. This archaeology is not a twenty-first-century innovation but rooted in the work of many scholars from many national archaeological traditions stretching back into the twentieth century. Papers in this symposium will synthesize and celebrate recent and foundational work on cities in Eastern Eurasia and their contexts from the Turkic periods (seventh CE) through the Mongol Empire (thirteenth–fourteenth CE) and into more recent eras.

**[80] Symposium · COFFEE, CLEVER T-SHIRTS, AND PAPERS IN HONOR OF JOHN S. JUSTESON**

This is a symposium in honor of John Justeson's career as a friend, scholar, teacher, and mentor. John has published extensively on the history and structure of Mesoamerican art and writing traditions, including Olmec, Epi-Olmec, Mayan, and Zapotec, as well as the calendrical and astronomical reckoning systems. Together with Terrence Kaufman he codirected a major project on the linguistic documentation of the languages of Mesoamerica leading to many PhD dissertations, grammars, and dictionaries. Topics for the symposium will include ways of understanding how information is processed and organized in spoken and written languages as well as material culture, especially in Mesoamerica, but also the Near East, the Mediterranean, and India/Pakistan.

**[81] Symposium · THE SUBTERRANEAN IN MESOAMERICAN CULTURAL LANDSCAPES**

This session attempts to bring together the most recent studies and approaches to the Mesoamerican subterranean. The importance of the subterranean in Mesoamerican cultural landscapes is now well documented in the form of both natural caves and artificial, constructed chambers. The power attributed to the subterranean in native cosmology means that these landmarks are magnets that draw activities and

settlement to themselves and thus become the focus of elaboration. Additionally, those elements closely associated with the sacred earth, such as cave formations, draw on that same power and thus are intrinsically significant artifacts that require greater interpretive attention when recovered in surface contexts

**[82] General Session · REPORTING IN: PROJECT AND EXPEDITION REPORTS FROM ACROSS THE GLOBE**

**[83] Lightning Round · REALIZING VALUE IN MESOAMERICA: THE DYNAMICS OF DESIRE AND DEMAND IN ANCIENT ECONOMIES**

The construction, imagination, and experience of “value” shapes our daily choices—how we spend our time, where we choose to invest labor, how we engage with others within and beyond our communities, and what we assign to realms of exchange or consider inalienable and “priceless.” Value is a social reality that requires a degree of consensus among individuals—consensus established in part through the marketplace. Yet, the establishment, meaning, and social power of value remains the subject of debate by social scientists even for modern cultures and economies. How might archaeologists infer consensus (or lack of consensus) about value in the past? Recent research on Mesoamerican economies has begun to offer greater inroads to this puzzle, highlighting complexities in patterns of production, exchange, and consumption that promise to shed light on precolumbian notions of value and challenge long-held approaches to the method and theory on these topics. The papers in this symposium present research from many parts of Mesoamerica, including Western Mexico, the Basin of Mexico, Veracruz, Oaxaca, and various parts of the Maya Lowlands. Chronologically, the papers range from the Classic period (250–900 CE) to the Spanish Conquest in the early sixteenth century.

**[84] Symposium · RECENT RESEARCH IN THE PETÉN LAKES REGION, PETÉN, GUATEMALA**

Over the past decade, the Petén Lakes region of Petén, Guatemala, has been the location of a number of archaeological projects. The new research includes lidar and photogrammetry surveys and associated ground-truthing, which have uncovered new sites and updated those previously mapped. In addition, new excavations at Nixtun-Ch'ich', Muralla de Leon, and Tayasal have refined site chronologies and revealed details about life in the region from the Middle Preclassic to colonial period. Major topics of investigation have included urbanization, site planning, and state formation in the Middle and Late Preclassic periods, and resettlement during the colonial period.

**[85] Symposium · HEAT, STEAM, AND HEALTH: THE ARCHAEOLOGY OF THE MESOAMERICAN PIB NAAH (SWEAT BATHS)**

Sweat baths have a deep history in Mesoamerica. While also used by males, they have a pan-Mesoamerican association with women and women's health issues, including childbirth, general fertility, and gynecological illnesses. Ancient images and recent excavations demonstrate the links between goddesses, fertility-linked reptiles, and sweat baths. In the last decade a number of sweat baths have been excavated providing new information on the form sweat baths of the precontact period took and the types of offerings associated with them. In addition, in some areas of Mesoamerica each household had a sweat bath, while in others sweat baths appear to be a structure shared communally. This session includes papers on ancient and modern sweat baths.

**[86] Symposium · STEP BY STEP: TRACING WORLD POTTING TRADITIONS THROUGH CERAMIC PETROGRAPHY**

The term *chaîne opératoire*, or the chain of production, is used to describe the whole process of ceramic manufacture. By understanding this process, we may investigate the series of operations that transform raw materials into a finished product. Qualitative and quantitative ceramic petrographic methods are uniquely suited to identify production methods, such as paste preparation, forming techniques, and firing atmosphere. Petrographic data can be utilized to characterize the different *chaînes opératoires* present in a ceramic assemblage so they might be ultimately connected to the intention of the potter. These baseline data can then be used for comparative analyses of production step sequences and to define local and regional

communities of practice. This session brings together case studies from around the world using thin-section petrography along with other complimentary methods, some of which aim to home in on individual steps while others analyze the chain of production in its entirety. By using these data to identify cultural patterns, these processes may be further used to answer larger questions such as those of identity and practice in relation to the spread of these chains of production.

### **[87] Symposium · HUNTER-GATHERER ARCHAEOLOGY OF LIGURIA: RECENT RESEARCH AND INSIGHTS**

Since 2014, there has been a boom of research in hunter-gatherer archaeology in the region of Liguria. This has included the excavation of new sites, the re-excavation of important sites excavated by prior generations of scholars, and the reanalysis of materials collected as part of pioneering projects across the region. This session brings together scholars to discuss the results of newly concluded projects such as those at Riparo Bombrini, Arene Candide, and Via San Francesco and ongoing projects or reanalyses of materials from sites such as Arma Veirana, Arma dello Stefanin, and Arma di Nasino. The goal is to provide a setting to critically discuss these new data and chart new directions for an integrated approach to the archaeology of foragers in the region across several disruptive events, including the Middle–Upper Paleolithic transition and the Pleistocene–Holocene boundary.

### **[88] Symposium · OLD TECHNOLOGY, NEW METHODOLOGY**

Given their excellent preservation and direct relation to subsistence and mobility, lithic studies have long been central to the field of archaeology. Even recently, some archaeologists felt we had reached the extent of knowledge that could be derived from lithics, but new technological innovations in analysis, statistics, and experimentation are advancing the limits of what lithic artifacts can teach us about human behavior. Such innovations have expanded the dataset from which models of human subsistence and mobility are built. This session showcases new directions in lithic studies including big-data analysis, morphometrics, use-wear, novel data sources, and refined experimental methods.

### **[89] Symposium · LATE PLEISTOCENE STEMMED POINTS ACROSS NORTH AMERICA: CONTINENTAL QUESTIONS AND REGIONAL CONCERNS**

Shoulderless stemmed projectile points are among the earliest widespread projectile technologies of Far West North America. In this area, stemmed projectile points first appear during the late Pleistocene and may be coeval with, or predate, the fluted points that appear in many other areas of the continent at this time. By the final centuries of the Pleistocene, stemmed projectile points like the forms of the Far West appear across most of North America from Alaska to Mexico and from the Pacific to Atlantic oceans. Despite the continental span of these point forms, this period in the early human history of the continent has received relatively little research effort compared to the fluted-point period in many regions. This session brings together participants from across the continent highlighting both the vast geographic extent and regional variability of shoulderless stemmed point technologies that appear across much of North America by the Pleistocene–Holocene transition. We hope this session will serve as a “call to action” for expanded research effort into this second continental scale technological radiation across North America.

### **[90] Symposium · RESEARCH, EDUCATION, AND AMERICAN INDIAN PARTNERSHIPS AT THE CROW CANYON ARCHAEOLOGICAL CENTER**

The Crow Canyon Archaeological Center (Crow Canyon), founded in 1983, is a nonprofit organization whose mission is to empower present and future generations by making the human past accessible and relevant through archaeological research, experiential education, and American Indian knowledge. As a core value, we believe the study of the past is an intrinsically worthwhile endeavor that creates more informed and sustainable societies. Through a better understanding of human history, we shed light on how the past can teach us about the challenges societies face throughout the world and strive to create change for the betterment of humanity. This symposium celebrates Crow Canyon’s past, present, and future by providing a backdrop to its humble beginnings and highlighting key mission accomplishments since 1983. Future directions presented here will guide southwestern research, collaborative partnerships, and public archaeology beyond current practices and provide meaningful strategic directions.

**[91] Symposium · CHECKING THE PULSE: CURRENT RESEARCH IN OAXACA PART I**

For this year's symposium, *Diálogos en Oaxaca Archaeology* brings together Mexican and American archaeologists to discuss their ongoing research. We are "checking the pulse," so to speak, on current research in Oaxaca. Presenters will discuss their projects in all stages of investigation: what they are discovering; what results are coming out of their current projects; what conclusions they are reaching; or even what questions they are considering tackling next. Oftentimes, it can be hard for researchers to keep up with all the investigations going on in their geographic areas of study, especially when we are located at different universities, institutions, and even countries. This can be especially difficult when dealing with transnational research where scholarly communities are divided by distance and other political and social boundaries. By checking in with each other, we aim to encourage further communication and hopefully generate greater collaboration between archaeologists who share a common goal—recording and preserving Oaxaca's ancient history for future generations.

**[92] Symposium · NEGOTIATING WATERY WORLDS: IMPACTS AND IMPLICATIONS OF THE USE OF WATERCRAFT IN SMALL-SCALE SOCIETIES**

*(SPONSORED BY ISLAND AND COASTAL ARCHAEOLOGY INTEREST GROUP)*

This session brings together archaeological case studies and theoretical frameworks that focus on the use and impact of watercraft in small-scale societies around the world. Present research on the role of boats and water transport in maritime societies has stressed the necessity of theorizing watercraft as both a means of transportation and instrument of production, and how these technologies structured social contexts, fueled and curtailed political centralization, and shaped world views. Case studies in this session stress a comparative approach in order to further our understanding of the interplay between aquatic environments, watercraft technology, and social change, ranging from studies focused on seafaring and organizational strategies (settlement and mobility patterns, ways of transport) to those concerned with social and ideological dimensions of society (gender, social complexity, exchange networks, identity, and ontologies).

**[93] Symposium · REGIMES OF THE ANCIENT MAYA**

In this symposium and its accompanying forum, we seek to open the black box of "the ancient Maya polity" by investigating diverse expressions of Maya political organization. In the study of ancient Maya political organization, the traditional and homogenizing concept of the Maya polity is largely ahistorical and ideological, reflecting primarily a bounded political unit recognized from within and without. We argue that the concept of regimes is better suited for studying how ancient Maya communities constructed, distributed, and legitimated political power. By investigating many variable yet coherent political practices, we seek to better understand the mosaic of "political communities" that characterized the ancient Maya world at distinct times in its long history. Our dual "Regimes" symposium and forum assemble scholars working across most of the Maya world and studying periods ranging from the Early Classic to the Late Postclassic.

**[94] Symposium · A FURTHER DISCUSSION ON THE ROLE OF ARCHAEOLOGY IN RESOURCE AND PUBLIC LAND MANAGEMENT**

As archaeological research shifted toward issues at the landscape scale, increasingly sophisticated methods and technologies provided the discipline with refined data that can be applied to the study of the evolution of ecological and cultural systems. In this symposium, we bring together a range of specialists to discuss the role of archaeological data in addressing an array of topics, from the definition of wilderness, water management, mammalian genomes, mammalian range shifts, and shifting landforms. These papers bring time depth to our understanding of past ecological communities and human-environment relationships through interdisciplinary approaches, including archival studies, biogeography, ethnography, geoarchaeology, and zooarchaeology. These case studies provide a more complete understanding of system dynamics for future protection and management.

**[95] General Session · MUTUALLY BENEFICIAL: TECHNOLOGIES IN ARCHAEOLOGICAL APPLICATION AND ARCHAEOLOGIES IN TECHNOLOGICAL APPLICATION PART II**

**[96] Symposium · ARCHAEOLOGY AND LANDSCAPE LEARNING FOR A CLIMATE-CHANGING WORLD**

How do we figure out how to live in unfamiliar places? For nearly 20 years, the model of landscape learning—which outlines how humans gather, use, remember, and share environmental information—has been a pathway for archaeologists to explore the processes of adaptation as part of human colonization and migration in many times and places around the world. But from its inception, landscape learning was also recognized as something humans need to do any time they find themselves in environments they do not know. Modern anthropogenic climate change is now changing environments around the world in new and rapid ways. The World Bank estimates that more than 200 million people will likely migrate due to climate by 2050—and billions more will experience their environments changing around them. Landscape learning is becoming a project for all of human society. Therefore, we now ask: What has archaeology learned about landscape learning that can help with the challenges of climate change? This session explores human capacity and practices in learning environments, examines how threads of learning—or lack thereof—have contributed to our present, and proposes ideas for policy for archaeology, migration, and climate adaptation going forward.

**[97] Symposium · BEHAVIORAL ECOLOGY AND ARCHAEOLOGY**

Behavioral Ecology is a well-established and productive research program, with decades of insightful output contributing greatly to our understanding of human adaptive diversity. Within the Society for American Archaeology, however, it has received only limited attention, mostly from archaeologists working with hunter-gatherers in western North America. Organized sessions explicitly devoted to behavioral ecology have been few and far between but are valuable to conference attendees. For that reason, we have organized this session to showcase critical work currently being done to advance Behavioral Ecology within archaeology. In particular, we hope to demonstrate that Behavioral Ecology is not confined to its traditional focus on subsistence and settlement dynamics among foragers, but rather provides a necessary and fruitful framework for studying a broad suite of complex behaviors within a wide variety of socio-environmental contexts, including social inequality, violent conflict, and geographic agglomeration.

**[98] Symposium · HERITAGE SITES AT THE INTERSECTION OF LANDSCAPE, MEMORY, AND PLACE: ARCHAEOLOGY, HERITAGE COMMEMORATION, AND PRACTICE**

Archaeology has traditionally worked through the lens of oversimplified binaries: historical versus precontact archaeology, the past as objectively separate from the present, or academic research versus compliance or public archaeologies, for example. This symposium presents a cross section of studies that attempt to extend beyond these dichotomies, to decolonize the practice of archaeology to be inclusive to previously marginalized voices, and to increase the access and relevance of heritage sites to the diverse publics.

**[99] Poster Session · WHAT'S GOING ON OUT THERE? METHODS AND FIELDWORK**

**[100] Poster Session · WE'VE GOT CHEMISTRY: CHEMICAL ANALYSES IN ARCHAEOLOGY**

**[101] Poster Session · THE ARCHAEOLOGY OF INEQUALITY**

**[102] Poster Session · OF GRAVE IMPORTANCE: MORTUARY ANALYSIS AND BIOARCHAEOLOGY**

**[103] Poster Session · ETHNOGRAPHIC RESEARCH IN ARCHAEOLOGY**

**[104] Poster Session · THE BETHEL CEMETERY RELOCATION PROJECT: HISTORICAL, OSTEOLOGICAL, AND MATERIAL CULTURE ANALYSES OF A NINETEENTH-CENTURY INDIANA CEMETERY**

Due to unavoidable redevelopment and facility expansion, the Indianapolis Airport Authority (IAA) contracted with the cultural resource management specialists of Cardno Inc. (now Stantec) to conduct public

coordination, background research, field documentation, geophysical investigation, excavation, and relocation of individuals buried in the Bethel Cemetery (12MA1025), located in Decatur Township, Marion County, Indiana. This once-rural cemetery, established in 1827, was utilized by early Indiana pioneers and their descendants until 1935. During the summer of 2018, 540 burial features, only 135 of which were unequivocally associated with headstones, were removed by Cardno in collaboration with faculty and students from Indiana University-Purdue University (IUPUI), University of Indianapolis (UIndy), and Indiana State University (ISU). Subsequent osteological and artifact analyses were conducted prior to reburial at a new cemetery in August 2019; this new location was rededicated in September 2019. This symposium presents ongoing research related to this excavation and associated analyses. Poster topics include photogrammetric imaging of the cemetery landscape and individual burials, bioarchaeological investigations of the human remains including demography and paleopathology, above- and belowground material culture analyses, and a discussion of the collaboration between the archaeological team, the living descendant community, the client, and additional stakeholders.

**[105] Poster Session · DIGITIZING ARCHAEOLOGICAL PRACTICE: EDUCATION AND OUTREACH IN THE ARCHAEOGAMING SUBDISCIPLINE**

The growing subdiscipline of archaeogaming addresses the intersection of archaeology and gaming in its broadest sense, via tabletop/board games, video games, card games, and myriad other types. It is primarily construed as the archaeology in and of games—this may include how archaeology is represented within gaming worlds, exploring the built landscape within a game, and examining material culture within a game, to list a few perspectives. Gaming remains an especially popular form of child and adult media, and it is particularly informative for us as archaeologists to understand how our discipline is presented in media forms that are engaged with by so many members of the public. The posters in this session highlight the educational and outreach-based impacts of archaeology in gaming. They explore a variety of game types in which the archaeological components receive varying levels of attention by the games themselves, exposing the need for archaeological insight into these portrayals of the field and its practitioners. The perspectives presented in this session represent a burgeoning subfield of critical media studies with a focus on archaeological content.

**[106] General Session · ON DISCIPLINARY CULTURE: CHALLENGING TRADITIONAL POWER AND KNOWLEDGE STRUCTURES WITHIN ARCHAEOLOGY PART I**

**[107] Forum · ARCHAEOLOGICAL SCIENCE AND TRIBAL INTERESTS IN THE PACIFIC NORTHWEST**

In the Pacific Northwest, many cultural heritage professionals consider archaeological science for its own sake to be intertwined in a legacy of European American colonialism. Up-and-coming researchers in precontact archaeology grapple with the ethics of collecting data, even in collaboration with Tribes. This forum brings together Pacific Northwest Tribal cultural resources representatives, academic researchers, and CRM archaeologists who are actively working through how to conduct archaeological science that prioritizes Tribal interests. We will explore when and how the tools and goals of science can be useful for social and environmental justice, and where they fall short. Themes will include archaeological science from the perspective of descendant communities and dilemmas faced by researchers who use data from lithics, ceramics, plant and animal remains, and sediment to practice respectful cultural heritage work. Participants will share short introductions and talking points followed by interactive discussions with participants and audience members.

**[108] Forum · VISUAL STORYTELLING AND COMMUNITY-BASED RESEARCH IN ARCHAEOLOGY**

In this forum, we focus on the ways in which documentaries and visual media serve to represent the perspectives of the researcher with the self-representation of community collaborators. Through visual media, this forum will emphasize the importance of creating platforms accessible to diverse forms of knowing and teaching, with the goal of challenging the limits of Western-centric academic worldviews. This forum asks participants to consider the ways in which we, as Western-taught researchers, are limited in our analyses of archaeological pasts, given the contemporary cultural lenses of capitalism and colonialism that shape our

current world. Through co-created storytelling, we center research as a reciprocal exchange that further allows the researcher to experience and implement alternative lenses and perspectives.

**[109] Symposium · THE CURRENT STATE OF ARCHAEOLOGICAL RESEARCH ACROSS SOUTHEAST ASIA**

*(SPONSORED BY SOUTHEAST ASIAN ARCHAEOLOGY INTEREST GROUP)*

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

**[110] Lightning Round · FROM THE ANDES TO THE AMAZON: IN HONOR OF CLARK ERICKSON**

Clark Erickson is a pioneering scholar of landscape archaeology, historical ecology, and four-field anthropology. For a half century, he has kept people at the center of his archaeological and anthropological practice in the Lake Titicaca Basin, the Bolivian Amazon, and beyond, and has invited his students and colleagues to do the same. His research in the Lake Titicaca Basin brought to light the long history of intensive agriculture in the Andes and the ability of local communities to organize it. In the Amazon, Clark's work transformed Mojos from an unknown backwater to a center of Amazonian studies. As a founder and leading figure in the field of historical ecology, his influence has spread far beyond anthropology and archaeology. Through his training at the University of Illinois and his long career at the University of Pennsylvania, he epitomized a rare combination of academic rigor and debate with collegiality and fellowship. This lightning round session includes tributes by students, friends, and scholars who have been inspired, encouraged, and provoked by Clark's long record of excellent, wide-ranging, and interdisciplinary work.

**[111] Symposium · ADVANCING THE ARCHAEOLOGY OF INDIGENOUS AGRICULTURE IN NORTH AMERICA**

Advances in paleoethnobotanical analysis over the last several decades have allowed archaeologists to gain an understanding of crop domestication and intensification, diet breadth, food storage, processing, and cooking practices, and even changes in subsistence strategies in response to climate change and warfare. While these analyses have focused on the production and consumption of agricultural foods, their scope is limited to post-harvest activities. This is only part of the picture, as Indigenous farmers spent a large portion of their time planning, brokering land, prepping fields, planting, and tending. Nevertheless, the location of fields and methods of planting and irrigation are often overlooked. To fully comprehend the scale of the labor, knowledge, and power wielded by Indigenous farmers to organize complex systems of agriculture, archaeologists must shift our focus to ask where and how crops were grown. The papers in this session explore these questions through geoarchaeological, environmental, ethnographic, and experimental methods to further advance our understanding of Indigenous agriculture.

**[112] Symposium · ALMOST 100 YEARS SINCE JULIO C. TELLO: RESEARCH AT HUACA DEL LORO, NASCA, PERU**

The expansion of first-generation empires was a key transformation that impacted societies in a myriad of ways. In the Andes, the Middle Horizon (500–1000 CE) was a time of interregional interaction, influenced by the expansion of the highland Wari. The relationship between the Wari and the coastal Nasca has been debated, especially the role of Huaca del Loro, the largest site during this period. Julio C. Tello (the father of Peruvian archaeology) and his team were the first to investigate the site in 1927, recording rectangular compounds and excavating large collective tombs. William Duncan Strong gave the site its current name in the 1950s and excavated a circular temple, as well as units in the compounds. In the 1980s the circular

temple was proposed to have been the result of Huarpa (pre-Wari) expansion. In the 2000s it was suggested that Huaca del Loro was a local settlement of Wari resistance. In this session, we bring together the results of two field seasons at Huaca del Loro that uncovered a Wari D-shaped temple and compounds, indicating the site was a Wari colony with a large residential area. These data broaden our knowledge of the expansion of first-generation empires and local transformations.

**[113] Symposium · COASTAL ENVIRONMENTS IN ARCHAEOLOGY: ANCIENT LIFE, LORE, AND LANDSCAPES**

Coastal environments have been among the most crucial venues of human evolutionary and cultural history, yet more work is needed for clarifying the relevant archaeological evidence, cultural folklore and traditions, and long-term paleo-environmental sequences of changing coastlines and habitats. This session invites experts in coastal studies to compare their diverse findings about ancient life, lore, and landscapes in the world's coastal zones, toward understanding the complex natural and cultural histories of coastal environments in a global perspective. The global-scale issues involve how people have adapted with changing coasts through variable periods of stability versus instability in climate, sea level, habitat ecology, cultural use of resource zones, population distributions, cross-regional migrations, and other aspects of urgent applicability in the world today and into the future.

**[114] General Session · ARCHAEOLOGICAL STUDIES OF HUMAN-ENVIRONMENT RELATIONSHIPS PART II**

**[115] Symposium · RECENT ADVANCES IN GROUND STONE STUDIES IN THE EASTERN MAYA LOWLANDS**

Used for common daily tasks, particularly food preparation, ground stone was vital to the functioning of precolumbian Maya households, yet it has historically received little archaeological attention. Fueled by new finds from traditional field archaeology and the growing availability and advances in compositional technologies, interest in the topic has blossomed over the past half-decade. As a result, our knowledge of the precolumbian Maya ground stone economy has greatly expanded with scholars learning more about how objects were crafted, where and how raw materials were being acquired, distribution networks, how they signify broader social meanings, and more. The purpose of this session is to bring together scholars investigating all facets of the precolumbian Maya ground stone economy, from raw material acquisition to end of life discard and beyond to discuss their current research projects, results, and visions for future directions of study.

**[116] General Session · ARCHAEOLOGICAL PEDAGOGIES FOR CLASSROOM, FIELD, AND LAB PART I**

**[117] Symposium · THE FUTURE OF EDUCATION AND TRAINING IN ARCHAEOLOGY**

A common refrain from archaeological employers is that both graduate and undergraduate students lack the key skills and experiences needed to be competitive for the nonacademic job market. Perhaps unwittingly, many university and college programs continue to prioritize learning outcomes with academic careers in mind, and assume all archaeological knowledge and skills are transferrable across the job market. One solution to this widespread problem is to encourage more collaboration between university programs and CRM firms, public institutions, and government agencies. This symposium aims to have a cross-industry dialogue about how we are training students and young professionals, where gaps in our training exist, and how to equitably fill those gaps. Contributors will discuss innovative educational approaches for the future of archaeology, and how to continue to encourage diversity and inclusion in recruitment and education. The symposium will include case studies in techniques for training archaeologists in multiple settings, highlighting examples of successful educational/research partnerships and career pipelines for students.

**[118] General Session · DOMESTICATION, EXPLOITATION, AND REVERENCE: STUDIES IN ZOOARCHAEOLOGY PART I**

**[119] Forum · MOVING ALONG WITH DECOLONIZING ARCHAEOLOGY: UPDATES AND OPEN MEETING**

*(SPONSORED BY TASK FORCE ON DECOLONIZING ARCHAEOLOGY)*

The SAA Task Force on Decolonizing Archaeology has continued with various activities and with developing recommendations for the SAA Board. We will continue with publishing regular columns in the “SAA Archaeological Record” and continue to seek advice, feedback, and suggestions from the membership. We will present the current members of the task force and will summarize our activities of the past year, what plans we have for the next year, and welcome discussion of issues and ideas.

**[120] Forum · CAREER PATHS IN CRM: A DIVERSE JOB MARKET**

Over the next decade career opportunities in cultural resource management are projected to soar, supported by increased spending at the federal level and more openings than applicants. Demand for people with graduate degrees is slated to be double that of folks coming out of university graduate programs. This boon to CRM work is an opportunity for upcoming graduates to enter a robust industry at the ground level. However, many graduates are unclear about what types of career paths are possible. This session is packed full of testimonials from CRM professionals about the paths their careers have taken, and shows a diversity of options including federal, state, and tribal roles in addition to specialist paths in technology, archaeobotany, geophysics, bioarchaeology, and public archaeology. This session highlights the range of CRM work out there and intends to provide details around particular paths and advice for upcoming and recent graduates interested in cultural resource management.

**[121] Poster Session · HUMAN-ENVIRONMENT INTERACTIONS IN CHANGING CLIMATES**

**[122] Poster Session · WHAT'S ON THE MENU? PART III: FAUNAL ANALYSIS**

**[123] Poster Session · PICTURE PERFECT: LANDSCAPE ARCHAEOLOGY**

**[124] Poster Session · THE IMPORTANCE OF ETHICAL ARCHAEOLOGY**

**[125] Poster Session · INNOVATIONS AND TRANSFORMATIONS IN MESOAMERICAN RESEARCH: RECENT AND REVISED INSIGHTS OF ANCESTRAL LIFEWAYS**

Broad and diverse recent research projects yield new perspectives on Mesoamerica’s fundamental evolutionary trends, social stratification, craft production, ideologies, subsistence, and, in general, ancient lifeways. New findings and legacy data contribute to our ongoing knowledge of ancestral Mesoamericans who lived in varied environments and managed landscapes ranging from neotropical forests to mountain habitats. Updated interpretations, novel insights, revised methodologies, and new technologies are presented by contributors. Participants expand our knowledge of materials studies (metallurgy, pigments, pottery analysis), bioarchaeology (dietary isotopes and skeletal analyses), rural and urban comparisons, social organization (through lidar and traditional methods), ritual, ideology, sports, cultural ecological perspectives, and royal palace scandals. Contributions highlight central Mexico, Michoacán, the Maya Lowlands, the Guatemalan highlands, and eastern and western Honduras through various time periods.

**[126] General Session · ARCHAOMETRY AND COMPOSITIONAL ANALYSIS STUDIES PART II**

**[127] General Session · READING STONE AND SOIL: RECENT STUDIES IN GEOARCHAEOLOGY**

**[128] Symposium · IF ANIMALS COULD SPEAK: NEGOTIATING RELATIONAL DYNAMICS BETWEEN HUMANS AND ANIMALS**

A fundamental component to the presence of animal remains within anthropogenic contexts is the underlying potential evidence for interactions and experiences. While there are many methods to examine and

reconstruct human-animal interactions, foundationally there are equally as many relational dynamics to consider. The diverse methodological approaches of twenty-first-century archaeology further provide profuse opportunities for us, as scholars, to theorize and explore many contextual, discursive, and dialectic dynamics of humans and animals from antiquity to the modern day. What cultural meanings were attached to wild animals in antiquity? How can one better evaluate the importance of domestic animals to ancient societies? How can we dialogue with our own anthropocentric biases when we set out to understand ancient pet keeping or transhumance? Are there ways in which we can expand our interpretations to be inclusive of these relational dynamics while recognizing the value of traditional zooarchaeological hypotheses? In this session, a range of spatially and temporally variable research about human-animal relationships—from ancient to modern—is presented, highlighting exciting paradigms, approaches, and examples of how we can thoughtfully, thoroughly, and holistically reconstruct human-animal dynamics within the archaeological record.

**[129] Symposium · AN EXCHANGE OF IDEAS: RECENT RESEARCH ON MAYA COMMODITIES**

This symposium explores recent anthropological research concerning commodities among Maya peoples from Formative times to the historic period, whose production was imposed by colonial powers. We think of commodities in a very general sense: any material item that is intended for exchange. Commodities can range from necessities that everyone needed to luxuries that were only obtained by kings and queens. Commodities can be examined in a number of different ways including their function, raw material source, or labor value. The symposium features a varied set of presenters to examine a wide variety of different commodities and various approaches to their analysis and interpretation. We hope the session appeals to attendees interested in the Maya and also those whose thematic focus deals with ancient commodities.

**[130] Symposium · HEARTHS, EARTH OVENS, AND THE CARBOHYDRATE REVOLUTION: INDIGENOUS SUBSISTENCE STRATEGIES AND COOKING DURING THE TERMINAL PLEISTOCENE AND EARLY HOLOCENE IN NORTH AMERICA**

During the Terminal Pleistocene and Early Holocene, Indigenous peoples across North America began to shift their subsistence strategies and implement new cooking technologies to adapt to a changing world. The late Alston Thoms referred to these changes in subsistence strategies as the “Carbohydrate Revolution,” and some of the foremost technological changes were the development of earth ovens and ground stone—both used to process primarily plant resources. There has been substantial archaeological research into this time period in North American history, but much of the research has overlooked cooking and plant processing technologies in favor of hunting and animal processing tools. This symposium brings together case studies from across North America to examine Terminal Pleistocene and Early Holocene Indigenous cooking features and honors the legacy of Alston Thoms.

**[131] Symposium · BEYOND LEAKY PIPELINES: EXPLORING GENDER INEQUALITIES IN ARCHAEOLOGICAL PRACTICE**

Numerous recent studies have demonstrated that an increase in the number of women with PhDs in anthropological archaeology has not substantially altered the percentage of women submitting senior NSF grants, publishing their research in peer-reviewed journals, or engaging in other prestigious academic activities. This session has two primary goals. First, it aims to continue documenting gender inequalities in archaeological practice by exploring a wider range of scholarly activities than is traditionally considered and with an explicit focus on questions of labor and prestige. Is there relative gender parity in the authors included in syllabi for archaeological courses, and who is doing the work to achieve better representation? How do intersectional identities differentially affect women in the field of archaeology? Second, this session aims to move beyond documentation to help explain why gender inequalities persist and how they might be ameliorated. Should scholars, for instance, critically examine often taken for granted notions, such as fit and prestige, that may unintentionally perpetuate exclusion? Or, should researchers attempt to articulate the subtle yet active ways in which inequality is enacted, such as gender devaluation and performative informality? Participants are encouraged to adopt new and innovative perspectives on a stubborn and persistent problem.

**[132] General Session · ON DISCIPLINARY CULTURE: CHALLENGING TRADITIONAL POWER AND KNOWLEDGE STRUCTURES WITHIN ARCHAEOLOGY PART II**

**[133] General Session · MATERIALITY OF MEANINGS AND AESTHETICS: ART AND CRAFT IN THE ARCHAEOLOGICAL RECORD PART I**

**[134] General Session · CORPOREAL CONCERNS: STUDIES IN BIOARCHAEOLOGY AND BODY MODIFICATION PART I**

**[135] General Session · ONE IF BY LAND, TWO IF BY SEA: UNDERWATER, ISLAND, AND SHORELINE ARCHAEOLOGIES PART II**

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

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

**[137] Symposium · THE EXPANDING BAYESIAN REVOLUTION IN ARCHAEOLOGY**

*(SPONSORED BY SAA QUANTARCH: QUANTITATIVE METHODS & STATISTICAL COMPUTING IN ARCHAEOLOGY INTEREST GROUP)*

Over the past three decades, archaeologists have become familiar with Bayesian inference's role in calibrating and modeling radiocarbon dates. The benefits of the Bayesian statistical paradigm, driven by straightforward software applications, have led to its association with radiocarbon calibration and chronology construction. However, Bayesian statistical inference may be applied more broadly to evaluate hypotheses. Archaeologists can and do apply Bayesian methods to answer diverse questions across different subjects and specialties. This symposium highlights Bayesian inference in archaeological research that includes and goes beyond calibrating radiocarbon dates and chronological applications. Beyond showcasing the broad variation of archaeological research questions answered by Bayesian inference, this symposium brings researchers together to chart a path forward to expand the training and use of the Bayesian paradigm in archaeology.

**[138] Symposium · DEEPENING ARCHAEOLOGY'S ENGAGEMENT WITH BLACK STUDIES**

Cultural anthropologist Savannah Shange (2019:7, 10) writes that because Black Studies scholars “work largely in the fields of English, history, and film studies, we don’t know much about how their interventions map onto blackness as lived and loved on a daily basis.” This, she argues, creates a space for anthropology to serve as a critical branch of Black Studies, as our work can often account for “the daily practices that facilitate Black” lives in ways that other disciplines cannot. Following Shange’s lead, this session explores the intersection of archaeology and Black Studies in three areas: (1) what archaeological case studies on the materiality of everyday lives can contribute to Black Studies; (2) how can archaeologists apply Black Studies theories (such as Black feminist theory or the work of Saidiya Hartman) to our work on the Black diaspora and beyond; and (3) what a deeper engagement with Black Studies would mean for archaeological methods and theories.

**[139] Symposium · A DECADE OF MULTIDISCIPLINARY RESEARCH AT CASTILLO DE HUARMEY, PERU**

Since 2010, an international team of scholars has performed multidisciplinary research at Castillo de Huarmey, a Middle Horizon (AD 650–1050) coastal provincial center and Wari necropolis, where an imperial mausoleum with the first undisturbed Wari high-status women's tomb and other elite burials was discovered. Using a broad methodological spectrum, including bioarchaeological, zooarchaeological, and biogeochemical analyses, alongside archaeometry, geoarchaeology, 3D HDS scanning, and architectural analysis, the archaeologists have brought to light a Middle Horizon cultural panorama and the nature and chronology of Wari imperial presence in this northwestern province. As a part of a commemoration of the 10th anniversary of the aforementioned discovery, this session will focus on the ideological impact, material footprint, Wari's ancestor worship, and the links between gender and power that can be observed in the burials and public architecture from this unique precolumbian archaeological site.

**[140] General Session · MORE THAN JUST NUTRITION: FOODWAYS, PLANTSCAPES, AND COMMUNITY****[141] Symposium · ADVANCES AND NEW PERSPECTIVES IN CENTRAL ASIAN ARCHAEOLOGY**

This symposium brings together researchers who focus on the wider Central Asian space, including the five post-Soviet Central Asian states (Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan), Afghanistan, Azerbaijan, Iran, Xinjiang, and Mongolia, as well as the Volga-Ural region to discuss current approaches and questions in Central Asian archaeology. By addressing a wide range of topics that are relevant to Central Asia, we aim not only to connect scholars working across Central Asia but also highlight the work of new researchers and methodologies being employed in archaeological research in the region. We welcome papers that approach Central Asian archaeology from a variety of perspectives and methodologies that focus on archaeological research from across all periods of our human past.

**[142] Symposium · TO HAVE AND HAVE NOT: A PROGRESS REPORT ON THE GLOBAL DYNAMICS OF WEALTH INEQUALITY (GINI) PROJECT**

Archaeologists can provide long-term perspectives and foundational background on pressing global problems and generate analyses using frameworks that unify the past and the present. Here we consider how past (and current) societies experience and respond to wealth differences, and the consequences of those choices. The GINI Project, sponsored by the Coalition for Archaeological Synthesis, managed through the Center for Collaborative Synthesis, and funded by NSF, is a coalition of researchers investigating the dynamics of wealth inequality in a rigorous and repeatable way, making comparisons across regions and through time to isolate factors associated with variable levels of wealth difference. Our chief measures of wealth inequality are Gini coefficients calculated across sizes of contemporaneous houses from a dozen world regions. Coalition members will present new findings based on their regional expertise, describing trends in household wealth inequality, and exploring the relationships between wealth inequality, political power, violence, structures of governance, and other factors. We also address methodological issues associated with the Gini index to characterize its performance in ethnohistorically known and contemporaneous western societies. We will demonstrate the power and productivity of a new model for archaeological collaboration that can contribute to addressing fundamental questions about wealth distribution in human societies.

**[143] Symposium · OUTREACH AND EDUCATION: EXAMPLES OF APPROACHES AND STRATEGIES FROM THE PACIFIC NORTHWEST**

Public outreach and education are carried out across our profession to meet different needs and goals. How do different organizations approach this important work? What can we learn from each other to better serve our missions and build community and support from the public? This session will host representatives from Tribes, state and federal agencies, museums, universities, and CRM firms from throughout the Pacific Northwest who will share recent examples of public outreach and education projects, including in-person informational booths and hands-on activities, interpretive displays, informational packets and handouts, workshops or presentations, social media and digital opportunities, and creative adaptations due to the

recent pandemic. This symposium supports the larger efforts within public outreach to develop “best practices” and in turn should encourage more attention to this critical branch of archaeology. Finally, the session provides an opportunity for presenters and the audience to build community as we celebrate and reflect on past and ongoing projects.

**[144] Forum · NUMU; NEME; NEWE; WAŠI•ŠIW: TEEPU COLLABORATIVE AND DECOLONIAL ARCHAEOLOGY: FORGING NEW PATHS AND ALLIANCES IN THE GREAT BASIN**

Indigenous Tribes of the western Great Basin of the United States are gaining momentum in achieving greater involvement in every aspect of proposed archaeological research conducted in their homelands. Great Basin archaeological assemblages include well-preserved cultural materials dating back more than 15,000 BP. Excavations in the Great Basin are typically conducted without the meaningful involvement of and/or consent of affiliated Indigenous communities. While tribes often have moral responsibilities to protect their Ancestors and associated material culture, colonialism has led to them rarely having legal authority for such protection. Who has or ought to have authority to represent the cultural past of tribal communities? Who speaks, or should have authority to speak for the treatment of excavated tribal material culture? What ultimately becomes, or should ultimately become of excavated tribal material culture? Further dialogue is needed in consideration of an ethically responsible archaeology for the future. In working toward greater cross-cultural collaboration, the table must be set broadly to include a spectrum of voices. Our session examines case studies and topics including collaborative Indigenous field schools held in Malheur County, Oregon, and Carson City, Nevada, as well examples of how collaboration and decolonial efforts bring about advancements in archaeology more broadly.

**[145] Symposium · ARCHAEOLOGY FROM WESTERN NORTH AMERICA**

Western North America is a geographically diverse region with an equally rich precontact record of indigenous cultures. This session is intended to provide a general geographically themed forum for the discussion of recent archaeological research.

**[146] Symposium · CHECKING THE PULSE: CURRENT RESEARCH IN OAXACA PART II**

For this year’s symposium, Diálogos en Oaxaca Archaeology brings together Mexican and American archaeologists to discuss their ongoing research. We are “checking the pulse,” so to speak, on current research in Oaxaca. Presenters will discuss their projects in all stages of investigation: what they are discovering, what results are coming out of their current projects, what conclusions they are reaching, or even what questions they are considering tackling next. Oftentimes, it can be hard for researchers to keep up with all the investigations going on in their geographic areas of study, especially when we are located at different universities, institutions, and even countries. This can be especially difficult when dealing with transnational research where scholarly communities are divided by distance and other political and social boundaries. By checking in with each other, we aim to encourage further communication and hopefully generate greater collaboration between archaeologists who share a common goal—recording and preserving Oaxaca’s ancient history for future generations.

**[147] General Session · FROM THE MATERIAL VESTIGES OF DAILY LIFE: ARCHAEOLOGIES OF THE HOUSEHOLD PART I**

**[148] General Session · LIMINAL SPACES AND EXCEPTIONAL PRESERVATION: ARCHAEOLOGICAL INVESTIGATIONS OF CAVES, CAVERNS, AND ROCKSHELTERS**

**[149] General Session · ARCHAEOLOGICAL PEDAGOGIES FOR CLASSROOM, FIELD, AND LAB PART II**

**[150] General Session · ARCHAEOLOGICAL STUDIES OF HUMAN-ENVIRONMENT RELATIONSHIPS PART III**

**[151] General Session · ARCHAEOLOGY HISTORY AND THEORY****[152] General Session · ARCHAEOLOGICAL STUDIES OF LITHICS PART II****[153] Symposium · ARCHAEOLOGY AND INDIGENOUS ISSUES IN HOKKAIDO ISLAND, JAPAN**

While many advances have been made in Japan with regard to the recognition of the Ainu as the Indigenous people of Japan, there remains much to be done in decolonizing the practice of archaeology and increasing community-based and Indigenous archaeological practice. This session presents a spectrum of topics related to decolonizing research practices around the Ainu on the island of Hokkaido, Japan. These include a call for understanding the origin of place names and the important role that archaeological and anthropological research can play in helping reestablish ties to place, concepts of heritage to the Ainu peoples with regard to aspects of tangible and intangible cultural history and the protection of archaeological sites, and a reporting on the alternative 2022 international field school.

**[154] General Session · ARCHAEOLOGICAL STUDIES OF LITHICS PART III****[155] General Session · AT THE INTERSECTIONS OF COMMUNITY, REGULATION, AND DEVELOPMENT: CONVERSATIONS IN HISTORIC PRESERVATION AND MANAGEMENT PART I****[156] Forum · SO YOU WANT TO BE AN ARCHAEOLOGIST: HOW TO GET FROM THE CLASSROOM TO THE PROFESSION**

Archaeology is changing. Technological advances, emerging social issues, and changes in cultural resource management and the legal framework governing it are drastically changing how archaeology is practiced. Coupled with monies for infrastructure, the result is expanded employment opportunities, most of which are in cultural resource management and outside academia. Unfortunately, opportunities in cultural resource management require skills that many departments do not offer. Consequently, students entering the profession, especially in cultural resource management, need to understand the demands of these opportunities and what they need to know to transition from being a graduate student to a professional. This forum brings together professionals representing different aspects of the discipline to discuss where the profession is today, career tracks, and the skill sets needed to launch and advance their career. The forum is aimed at those who have recently received or are about to receive their degree and are trying to transition into the profession.

**[157] Forum · ARCHAEOLOGY AND CLIMATE JUSTICE: AN ACTION-ORIENTED INTERDISCIPLINARY RESPONSE**

Climate change is a multigenerational issue, exponentially destroying safety and security for future human generations and globally interconnected ecosystems. Research has demonstrated that the impacts of climate change will continue to disproportionately impact historically marginalized communities. Evidence of a prior or current community's existence will be wiped away by flooding, fires, and poorly conceived infrastructural improvements. What can archaeologists do in the face of this destruction? In this action-oriented forum, we will examine how archaeology can serve as a rallying cry in the face of sea-level rise, heightened wildfires, and violent storms. As archaeological sites (both Indigenous and historic), unmarked or underfunded cemeteries, and historically marginalized communities are destroyed or erased by the effects of climate destabilization, how can we use this destruction to raise awareness about the existence and importance of the past? Forum speakers will detail their experiences confronting the intersection of climate change and marginalization, through case studies and personal experience. The goal of this forum is to galvanize the profession into action-oriented interdisciplinary response. How are archaeologists leveraging their positions to bring visibility and develop interventions to combat this inequitable cultural erasure?

**[158] Forum · REGIMES OF THE ANCIENT MAYA: THE FORUM**

In this forum and its accompanying symposium, we seek to open the black box of “the ancient Maya polity” by investigating diverse expressions of Maya political organization. In the study of ancient Maya political organization, the traditional and homogenizing concept of the Maya polity is largely ahistorical and ideological, reflecting primarily a bounded political unit recognized from within and without. We argue that the concept of regimes is better suited for studying how ancient Maya communities constructed, distributed, and legitimated political power. By investigating many variable yet coherent political practices, we seek to better understand the mosaic of “political communities” which characterized the ancient Maya world at distinct times in its long history. Our dual “Regimes” symposium and forum assemble scholars working across most of the Maya world and studying periods ranging from the Early Classic to the Late Postclassic.

**[159] Symposium · DEVELOPING PALEOLITHIC EXCAVATION METHODS FOR THE TWENTY-FIRST CENTURY**

The excavation of sites and their constituent artifacts are the main way in which primary archaeological data is produced. Despite the development of new analytical tools in the last two decades, excavation procedures, routines, and techniques remain comparatively unchanged. This is partly because new excavation methods are often regionally segregated and isolated by subdiscipline. It is therefore necessary to periodically appraise and synthesize methodological improvements across the discipline. This symposium aims to disseminate and foster new excavation developments by bringing together field archaeologists to share methodological advances and reflect on current excavation practices. Touching on topics ranging from sampling, plotting, visualization, photogrammetry, taphonomy, and preservation, our objective is to evaluate the progress in excavation practices over the past 20 years. In doing so, we hope to create a forum for field archaeologists across subdisciplines to share how to record excavation data more accurately and efficiently.

**[160] General Session · EXAMINING VIOLENCE, WARFARE, AND COERCION THROUGH SPACE AND MATERIAL CULTURE PART I****[161] General Session · CONSIDERING CERAMICS: TECHNOLOGICAL, ECONOMIC, AND SOCIOCULTURAL APPROACHES PART I****[162] General Session · ATTENDING TO THE DEAD: STUDIES IN MORTUARY ARCHAEOLOGY PART I****[163] General Session · ADNA RESEARCH IN ARCHAEOLOGY AND FOR ARCHAEOLOGICAL APPLICATION****[164] Symposium · HUMBLE HOUSES TO MAGNIFICENT MONUMENTS: PAPERS IN HONOR OF JERRY D. MOORE**

Dr. Jerry Moore is one of the most geographically and thematically prolific and influential anthropological archaeologists of his generation. His research has spanned from the foraging and subsequent historical societies of Baja California and the western United States, to the prehispanic households and empires of coastal Peru. Perhaps his most influential contributions have explored the lived experience of the built environment—ranging from monumental architecture to everyday houses. In the course of his career, Moore has written more than 35 articles and published seven books, including a widely used textbook on anthropological theories, no small feat for a field archaeologist. This research has inspired archaeologists working in many regions to think about public spaces and domestic places in novel ways. He is also widely recognized for his selfless service to the Institute of Andean Studies and other professional organizations and active mentorship of undergraduate and graduate students. Jerry’s productivity and friendship have inspired many of us to read more, write more, and think more broadly. Session participants, his peers and mentees working across the Americas, present a wide range of research informed and inspired by Dr. Moore’s own work.

**[165] Symposium · PROVISIONING ANCIENT MAYA CITIES: MODELING FOOD PRODUCTION AND LAND USE IN TROPICAL URBAN ENVIRONMENTS**

Discussions of Maya agriculture and its relationship to population have followed a pendulum arc over the past century. Site mapping projects and regional-scale lidar surveys have shifted conceptions of Maya cities from small centers, supported by low-yield cultivation strategies, to populous urban landscapes incorporating agricultural terracing and raised fields in some areas. Archaeologists have continued to refine their understanding of how large populations provisioned themselves over the centuries of the Classic period apogee of Maya civilization (250–900 CE). This symposium represents the first large-scale comparative effort to address this issue using cutting-edge techniques of spatial analysis, remote-sensing data, and traditional ecological knowledge from living Maya farmers. Using the same methods, participants will combine settlement data and DEM-derived slope maps to quantify zones within and around their study areas suitable for traditional milpa-cycle agriculture or more intensive practices. The milpa model excludes terrain covered by architecture and home gardens at two different slope thresholds. Labor inputs can be tuned to reflect varying levels of intensification to reconcile with the estimated caloric needs of populations. Our work will explore potential variability in agricultural production at Maya cities and investigate strategies of traditional land use across multiple environments in the tropical Maya lowlands.

**[166] Symposium · ARCHAEOLOGICAL SCIENCE AND AFRICAN ARCHAEOLOGY: APPRECIATING THE IMPACT OF DAVID KILLICK**

For the past 30-plus years, David Killick has been a key figure contributing to two principal areas of archaeology: (1) the development, expansion, and advancement of archaeological science; and (2) the advancement of knowledge in African Archaeology through the application of archaeological science. His contributions to each are noteworthy, and while his earlier research focused mainly on Africa and archaeometallurgy, more recent work has focused on ceramic petrography and various isotopic provenance studies of archaeological materials worldwide. He has been at the forefront of transforming both areas of research, including being the initiator and key figure of the hugely successful NSF-funded IGERT program at the University of Arizona between 2003 and 2008. This project produced 30 PhDs employing archaeological science in their research, many of whom are here today. In this symposium, his students, colleagues, and collaborators share contributions inspired by or undertaken with David in studies of ancient technology, archaeological science globally, ceramic petrography, provenance studies of archaeological materials, theoretical development, and archaeological science in Africa.

**[167] Symposium · SITE STEWARDSHIP MATTERS: COMPARING AND CONTRASTING SITE STEWARDSHIP PROGRAMS TO ADVANCE OUR PRACTICE**

In 2014, the initial site stewardship survey was conducted to gather information from the known site stewardship programs, located at that time primarily in the West. Since then, more site stewardship programs have emerged and more are starting to organize. The second site stewardship survey was launched in the spring of 2022 to update and expand the original study. This session presents papers from the various organizations demonstrating their own affordances and constraints. The session will summarize findings from the 2022 survey and premier a video that links the program together.

**[168] Symposium · ESTABLISHING THE SCIENCE OF PALEOLITHIC ARCHAEOLOGY: THE LEGACY OF HAROLD DIBBLE (1951–2018) PART I**

In a career spanning four decades, Harold Dibble's work had a profound impact on (1) the interpretation of Mousterian variability, (2) our understanding of lithic technology, (3) our evaluation of Neanderthal behavior, and (4) the methods we use to excavate Paleolithic sites. Underlying these contributions was his unwavering commitment to archaeology as a scientific endeavor. This commitment included hypothesis testing, quantification of data, statistical evaluation of results, and sharing of data. His legacy consists of a radically revised understanding of Neanderthal cultural behavior, where fire-making, symbolic burial, and language must be demonstrated, not assumed; a new science of lithic technology; and a clarification of the meaning of Mousterian industrial variability. His excavation methods have established a new standard for the field. At his untimely death in 2018, Dibble left behind a robust experimentation program; active field research that was producing new data on Neanderthal behavior; and countless colleagues and students pursuing groundbreaking

work, inspired by his call for a rigorous scientific-based approach to archaeology. This session, part 1 of 2, brings together Dibble's students and colleagues to present new results and to reflect on his legacy and the way in which it has changed the future of Paleolithic archaeology.

**[169] Symposium · ADVENTURES IN SPATIAL ARCHAEOLOGY: A SURVEY OF RECENT HIGH-RESOLUTION SURVEY AND MEASUREMENT APPLICATIONS**

*(SPONSORED BY NEH SPATIAL ARCHAEOLOGY RESIDENTIAL AND ONLINE INSTITUTE)*

Geospatial technology is an increasingly integral component in the measurement and analysis of time, space, and form. The democratization of methods in high-density survey and measurement (HDSM), such as photogrammetry and laser scanning, creates new opportunities and challenges alike. Keeping abreast of rapid advances requires a regular survey of applications. Emerging, early career scholars are often among the most innovative of users. SAROI, the Spatial Archaeology Residential and Online Institute, an NEH-funded initiative hosted by the Center for Advanced Spatial Technologies at the University of Arkansas, has provided training to 19 emerging scholars in HDSM. This session showcases the multiple ways that SAROI fellows engage with spatial data to analyze landscapes, sites, features, and objects. Fellowship projects address a wide range of time periods and are unified not just through the use of HDSM techniques but through their commitment to highlighting marginalized histories and through research and representation in the Global South. Applications of HDSM discussed in the session include 3D modeling using sUAS sensors, photogrammetry, and microCT, satellite and aerial imagery analysis, and geospatial database creation and analysis.

**[170] Symposium · A TRIBUTE TO THE CONTRIBUTIONS OF LAWRENCE C. TODD TO WORLD PREHISTORY**

For five decades, Lawrence C. Todd has fueled archaeology on multiple continents with a steady stream of novel ideas, innovative methods, and remarkable datasets. He has made substantive, empirical contributions to faunal exploitation, occupation of high-altitude environments, human evolution, field methods, and the prehistory of North America, Africa, and Asia. This session reflects on his valued contributions: celebrating his influence on how we view, record, and attempt to explain the archaeological record and how we must continually generate new questions to confront our often-unchallenged assumptions about the past.

**[171] Symposium · DEBITAGE ANALYSIS: CASE STUDIES, SUCCESSES, AND CAUTIONARY TALES**

*(SPONSORED BY LITHIC TECHNOLOGY AND ANALYSIS INTEREST GROUP)*

The archaeological literature is full of different ways of conducting debitage analysis to address research questions. The recurrent critiques include (1) the large amount of time needed to record flake types or flake attributes, (2) the implicit subjectivity in defining analytical units, (3) the unjustified assumptions that are made in defining classes of objects or selecting attributes for recordation, and (4) the lack of comparability of the data recorded across assemblages. All these critiques have missed the point. Debitage analysis objectives may be focused or broad, but in either case, the analyses should explicitly support the goals of the endeavor. The papers in this symposium provide examples of debitage analysis practices that have successfully addressed the research goals of the analyst and/or have provided insights into the best ways of extracting the specific information needed.

**[172] Symposium · DYNAMIC FRONTIERS IN THE ARCHAEOLOGY OF CHIAPAS**

Archaeological investigation has established that Chiapas was a place of cultural and economic florescence throughout the precolumbian past. From the Central Depression to the highlands and beyond, ancient peoples of Chiapas cultivated interregional connections, constructed sophisticated site centers, and created innovative artistic and architectural traditions. One of the unique aspects of this region is its past and present cultural diversity, including groups with linguistic roots in several different Mayan languages, as well as Zoque and Chiapanec. Relationships between different polities and cultural groups waxed and waned over time, shifting with the formation and dissolution of political alliances, trade networks, migrations, and new technologies. Archaeologically, such shifts can be traced through changes in the origin of goods or stylistic attributes of a wide range of material culture, from settlement patterns, to elite offerings, to ordinary household consumption patterns. This symposium seeks to shine light on the dynamic frontiers of Chiapas,

and to highlight recent archaeological research in the region. Papers may address interactions between Maya and other Indigenous groups, relationships across frontiers within the westernmost Maya area, or recent archaeological investigations of sites in Chiapas.

**[173] Symposium · CLIMATE AND HERITAGE IN THE NORTH ATLANTIC: BURNING LIBRARIES**

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

The North Atlantic and Circumpolar North have seen unprecedented impacts of rapid climate change on cultural heritage and the archaeological record. Rising sea level, increasing storminess, and rising soil temperatures are rapidly destroying the archaeological record at a frightening rate. Prior SAA sessions have highlighted these threats and a growing number of national and international efforts have been organized in response. A growing realization of the vital importance of active participation by local and traditional knowledge holders and local communities has united archaeologists and host communities in a shared effort to save what we can while we can. This session will present a series of projects and initiatives that are working to respond to climate threats and create better pathways to co-production of knowledge and community participation at all levels. Participants from Canada, Greenland, Iceland, the UK, and Norway will present project results and plans for renewed collaboration. This session is a satellite of the SAA Climate Change Strategies and the Archaeological Record committee.

**[174] Symposium · CANINE RESOURCES FOR THE ARCHAEOLOGIST**

Archaeology is inherently a multidisciplinary discipline that has borrowed and refined theory while incorporating techniques from earth science-related fields throughout the last century. This is particularly true for noninvasive survey techniques for sensitive archaeological sites. One survey method that has experienced increased application over the past decade is the utilization of canines to assist in the detection of human remains. Deploying properly trained human remains detection canines in concert with geophysical instruments allows for a more complete understanding of a site's subsurface features of sites without the unintentional disturbance of human burials. The purpose of this symposium is to help provide the archaeological community with greater exposure to case studies where these techniques have been applied. The archaeological community will also learn how to deploy these canines within the archaeological survey context to assist in projects, as well as identify appropriate canine resources that are properly trained in archaeological human remains detection

**[175] General Session · CORPOREAL CONCERNS: STUDIES IN BIOARCHAEOLOGY AND BODY MODIFICATION PART II**

**[176] Poster Session · REMOTE SENSING PART I: LIDAR AND SATELLITE IMAGERY**

**[177] Poster Session · REMOTE SENSING PART II: GEOPHYSICAL TECHNIQUES**

**[178] Poster Session · GO WITH THE FLOW: UNDERWATER ARCHAEOLOGY AND WATERCRAFTS**

**[179] Poster Session · HUNTERS AND GATHERERS AND FORAGERS, OH MY!**

**[180] Poster Session · CAVES AND ROCKSHELTERS**

**[181] Poster Session · COLLABORATIVE ARCHAEOLOGY AND COMMUNITY OUTREACH**

**[182] Poster Session · DIGGING DEEPER: PUSHING OURSELVES TO ENGAGE THE PUBLIC IN OUR SHARED HERITAGE THROUGH OUTREACH AND EDUCATION**

Federal land management agencies collectively administer approximately 606 million acres of public land within the United States. Archaeologists within these agencies support the maintenance, protection, and preservation of cultural resources for present and future use, efforts that are essential to each agency's

mission. While primary duties include the management of historic and cultural resources via compliance with Section 106 of the National Historic Preservation Act (NHPA), federal archaeologists may also find themselves with the unique opportunity to spearhead public outreach and education efforts, a growing priority within the greater archaeological community. It is the responsibility of the agency archaeologists to engage the interested public—that is, the people for whom they are maintaining, protecting, and preserving these resources—in the archaeological process. Inclusion of the public through partnerships with tribes, schools, and organizations serves to make the work archaeologists do, and the resources they manage, relevant to the greater community. This symposium recognizes and emphasizes efforts in outreach and education, exhibiting a standard to be incorporated in future archaeological work.

**[183] General Session · FROM THE MATERIAL VESTIGES OF DAILY LIFE: ARCHAEOLOGIES OF THE HOUSEHOLD PART II**

**[184] Symposium · PEOPLING THE PAST: CRITICALLY EVALUATING SETTLEMENT AND REGIONAL POPULATION ESTIMATES WITH NEW METHODS AND DEMOGRAPHIC MODELING**

Understanding the relationships between the scale of population levels, food production, and emerging social inequality has long been a central focus in archaeology and anthropology. Often based on surface distribution of cultural materials, or mortuary analysis, researchers have advanced relatively high population estimates. While there are exceptions, these are often based more on intuition and less on detailed comparative analysis or statistical methods. Be it focused on Woodland mounds of the eastern North America, Pueblos of the American Southwest, or Neolithic villages of the Near East, or a host of other case studies, some of these estimates have become enshrined in archaeological literature and the minds of the general public. In this session presenters reengage with how we reconstruct population levels within a settlement, how we estimate regional population change, and what methods are best employed to estimate how many people lived at a settlement. Beyond thinking about methods for demographic reconstruction, and the extent to which researchers are over estimating past population levels, the presenters in this session will reconsider a range of perspectives on how population growth and pressure may have served as drivers of short-term decision making and long-term evolutionary change.

**[185] General Session · AT THE INTERSECTIONS OF COMMUNITY, REGULATION, AND DEVELOPMENT: CONVERSATIONS IN HISTORIC PRESERVATION AND MANAGEMENT PART II**

**[186] Forum · (RE)CONSIDERING THE ENTRADA: THIRTY YEARS ON FROM PROSKOURIAKOFF'S "ARRIVAL OF STRANGERS"**

This year's SAA meeting will mark 30 years since the publication of "Maya History" by Tatiana Proskouriakoff in which she wrote about the, now memorable, "Arrival of Strangers." It will likewise be 23 years since David Stuart's pivotal marshalling of the epigraphic evidence that further outlined the momentous political events surrounding the I I Eb date that marked the arrival of the stranger Sihyaj K'ahk' into the Maya Lowlands broadly and Tikal more specifically. The goal of this forum is to gather newly emerging archaeological and epigraphic evidence and thereby reignite this conversation in view of this new data from across the Petén. Preliminarily, the data address long-existing gaps in understanding while simultaneously revealing new questions. Evidence in hand now 30 years on from Proskouriakoff's writing reveal that the fundamentals of this encounter are far more complex, nuanced, and worthy of reconsideration.

**[187] Forum · "WHERE ARE ALL THE ARCHAEOLOGISTS?" A FORUM FOR COLLABORATIVE AND EQUITABLE PREPARATION FOR A CAREER IN RESOURCE MANAGEMENT**

*(SPONSORED BY STUDENT AFFAIRS COMMITTEE)*

The title of this session came from a colleague working in transportation. As new federal transportation money began to flood into the states, a shortage of well-prepared young talent became instantly and painfully obvious to program managers. The shortage signaled a crisis spawned by education costs, a lack of

appropriate training, salary and benefit inequities, and diminishing partnership opportunities between academia and the CRM community. This forum, sponsored by the SAA Student Affairs Committee, will address all of these issues as well as those of diversity, access, and inclusion in the workforce, and will maximize opportunities for attendees to have their questions answered by a panel of experienced and rising CRM practitioners and university faculty. If you are interested in a career in this demanding and rewarding part of the profession, or you are teaching or mentoring aspiring resource managers and young professionals, please plan to attend.

**[188] Forum · BUILDING ANTIRACIST ARCHAEOLOGIES**

This forum explores how and why building antiracist archaeologies is necessary for our discipline. By convening leading archaeologists practicing antiracist work, this forum creates space to discuss possible directions for these archaeologies, including drawing on an Ethnic Studies praxis that centers community-engaged research; employing diasporic frameworks; and foregrounding Black, Indigenous, and People of Color (BIPOC) epistemologies to critique race, racism, and racialization in archaeological praxis. This conversation provides a critical intervention for our field in the twenty-first century and charts future directions for building antiracist archaeologies.

**[189] General Session · FROM THE MONUMENTAL TO THE MINUTE: ARCHITECTURE AND THE BUILT ENVIRONMENT PART I**

**[190] General Session · ADAPTATION, NEGOTIATION, AND POWER: RECENT STUDIES IN CONTACT AND COLONIALISM PART II**

**[191] General Session · CONSIDERING CERAMICS: TECHNOLOGICAL, ECONOMIC, AND SOCIOCULTURAL APPROACHES PART II**

**[192] General Session · AT THE INTERSECTIONS OF COMMUNITY, REGULATION, AND DEVELOPMENT: CONVERSATIONS IN HISTORIC PRESERVATION AND MANAGEMENT PART III**

**[193] Forum · ADVANCING THE STATUS OF WOMEN IN ARCHAEOLOGY**

*(SPONSORED BY COSWA)*

Fifteen years ago, COSWA sponsored a working group designed to bring women together at various stages of their career and in various types of employment to discuss mentoring. This year, COSWA builds on this group by providing a forum where a panel of women will discuss topics related to career advice. The forum aims to provide a space where students, early and middle career researchers, and people aiming to change careers can learn about specific questions such as applying through USA jobs, grant writing, creating a CV, Fulbright scholarships, parenting in archaeology, and archaeological work in Australia. In advance of the session, COSWA will solicit questions to the membership to ensure that topics of concern are addressed.

**[194] Forum · FIRES EVERYWHERE: REVIEWING THE CULTURAL RESOURCE RESPONSE TO THE 2020 OREGON WILDFIRES**

In 2020, nearly one million acres of forest burned across Oregon, devastating communities and forests on federal, state, public, and private lands. The emergency response to these events created an unprecedented situation regarding the protection and recordation of cultural resources involving the ODOT, FEMA, USFS, BLM, Oregon Tribes, and HRA. This forum brings together representatives from federal and state agencies, tribal governments, and cultural resource professionals to discuss key research topics and lessons learned following the unprecedented 2020 Oregon wildfire season. Topics discussed will include best management practices, pre- and post-protection of cultural resources during disaster response, protecting the safety and mental health of archaeological monitors, and planning for future events.

**[195] Forum · WHAT ARE THE PROSPECTS AND IMPLICATIONS FOR OPEN ACCESS PUBLICATIONS AND THE SAA?**

*(SPONSORED BY SAA PUBLICATIONS COMMITTEE)*

All three SAA journals are currently published by the Cambridge University Press. While everyone involved with publications likes the idea of Open Access publishing, there are a number of issues with the current system, in terms of authors, readers, and access. This session will outline the advantages and problems. Further, the current Cambridge Read & Publish agreements are transitional—they are not sustainable long-term for a variety of reasons. We hope to outline some of the problems of Open Access, as well as the many advantages and alternative directions, so that the SAA membership understands and appreciates upcoming potential changes and issues. Panelists include members of the Publications Committee, as well as others actively involved in the discussion.

**[196] Poster Session · DEFINING PERISHABLES: THE HOW, WHAT, AND WHY OF PERISHABLES AND THEIR IMPORTANCE IN UNDERSTANDING THE PAST**

This poster session will delve into the importance of perishables in the everyday lives of people in the past and present. Innovations in this area have been important in the sociocultural development and success of past civilizations, and the preservation of traditions today. Participants will demonstrate how new technologies, ethnographies, and experimental archaeology help researchers better understand perishables and their role in interpreting the archaeological record. Organized with the Fiber/Perishables Interest Group (FPIG).

**[197] Poster Session · LIQUID LANDSCAPES: RECENT DEVELOPMENTS IN SUBMERGED LANDSCAPE ARCHAEOLOGY**

The study of submerged landscapes has accelerated in popularity necessitated by a need for practitioners in cultural resource management (CRM), increasing student interest, and expanding opportunities for study at colleges and universities globally. The increased interest in the topic has led to methodological advancement and refinement and has promoted the study of inundated archaeological sites in multiple geographic regions and cultural time periods. Additionally, the increasing study of submerged landscapes has brought attention to missing, or absent, datasets that can only be located through underwater prospection. This session will showcase data from current submerged landscape projects to bring together varying perspectives on the study of these sites from myriad geological and environmental settings around the world. Posters will variably highlight methodological advancement, evolving theoretical frameworks, contributions to regional culture histories, paleoenvironmental reconstructions, descendant community involvement, industry applications, and future directions of the discipline.

**[198] Poster Session · THE SOCIOECOLOGICAL DYNAMICS OF HOLOCENE FORAGERS AND FARMERS**

This symposium brings together researchers working on long-term changes in the socioecology of foraging and farming populations in North America. We attempt to answer key questions, such as, How do climate and population interact to drive long-term changes in hunting and plant food processing; and how do such changes in subsistence practices, in turn, impact population growth, group size, and burial practices among-foragers/farmers? The symposium aims to better understand such questions by bringing together specialists working on case studies in the semiarid grasslands of North America. Each poster will present data on long-term changes in material culture, climate, subsistence, and/or population processes, and the posters will each present different methodological approaches to understanding the long-term interactions between climate, population dynamics, and social/subsistence change.

**[199] Poster Session · MOGOLLON, MIMBRES, AND SALADO ARCHAEOLOGY IN SOUTHWEST NEW MEXICO AND BEYOND**

Southwest New Mexico from AD 600 to 1450 encompasses multiple archaeological culture areas differentiated by patterns in ceramics, architecture, and other material culture. The highly diverse archaeological record of this region makes it well suited to exploring change over time, including migration, responses to environmental change, and internal sociopolitical reorganization. This variability also offers

opportunities for comparisons with other areas of the US Southwest at larger spatial scales. This session brings together diverse approaches to understanding this temporal and spatial variability, including GIS, chipped stone, ground stone, ceramic, and paleoethnobotanical analyses, as well as experimental archaeology.

**[200] Poster Session · TZINTZUNTZAN, CAPITAL OF THE TARASCAN EMPIRE: NEW PERSPECTIVES**

The Centro INAH-Michoacán has generated a research project that seeks to renew the knowledge of the ancient imperial capital of the Tarascan Señorío. This ancient city has been archaeologically studied for almost 90 years; however, there are many issues that have not been sufficiently addressed. This poster session seeks to present the data and studies achieved in the last three years by a group of consolidated researchers, as well as undergraduate and graduate students.

**[201] Poster Session · RECENT ARCHAEOLOGICAL RESEARCH BY PALEOWEST**

With over 1,500 projects conducted in 2021 and 2022, PaleoWest archaeologists have contributed to critical research advancements nationwide. Coast to coast, they have documented a wide diversity of cultural and environmental contexts and tackled various logistics challenges. In this poster symposium, PaleoWest archaeologists from the Phoenix, Los Angeles, Denver, and Tallahassee offices team up to present the scope and results of some of their recent archaeological investigations.

**[202] Poster Session · THE CHENGDU PLAIN ARCHAEOLOGY SURVEY (2004–2011): HIGHLIGHTS FROM THE FINAL REPORT**

The Chengdu Plain Archaeological Survey was completed in 2011 after five seasons of large-scale surface survey and subsurface coring, geophysics, and test excavations. The survey examines prehistoric through Han-era settlement patterns in the Chengdu Plain of the Sichuan Basin of China, surrounding two walled sites dating to the Neolithic Baodun period. Finds were collected from surface contexts and auger holes and dated to the Neolithic, Bronze Age, and Han periods and reflect changing land use across the region during the 2,000+ years at the end of the common era. Various unavoidable circumstances delayed the processing and interpretation of many of the data, but now a completed report of the database and synthetic studies has been completed. This session symposium includes posters from various team members representing elements of the report.

**[203] General Session · DOMESTICATION, EXPLOITATION, AND REVERENCE: STUDIES IN ZOOARCHAEOLOGY PART II**

**[204] Symposium · A SESSION IN MEMORY OF WILLIAM J. FOLAN: CITIES, SETTLEMENT, AND CLIMATE**

William J. Folan (1931–2022) was an indefatigable researcher who made substantive contributions to archaeological scholarship over the course of a professional career spanning seven decades. Reflecting the influence of his advisor Walter W. Taylor, Willie's ideas often went against the mainstream. This is most clearly reflected in his seminal work on Maya settlement patterns and urbanism, as well as theories that explored the impacts of climatic variability on long-term historical dynamics. Although best known for his pathbreaking studies of two of the largest precontact Maya cities—Coba and Calakmul—his work made a substantive impact across Mesoamerica and North America. Perhaps Willie's greatest strength was as a collaborator, with a proven track record of creating opportunities for junior colleagues. His personal story and 60-year investment in field research highlight a lifelong dedication to the advancement of the field. In this session colleagues and friends will come together to highlight Willie's lasting contributions to archaeology in the areas of settlement patterns, urbanism, political organization, and human-environmental interactions.

**[205] General Session · ATTENDING TO THE DEAD: STUDIES IN MORTUARY ARCHAEOLOGY PART II**

**[206] General Session · MATERIALITY OF MEANINGS AND AESTHETICS: ART AND CRAFT IN THE ARCHAEOLOGICAL RECORD PART II**

**[207] Symposium · SUPPORTING PRACTICAL INQUIRY: THE PAST, PRESENT, AND FUTURE CONTRIBUTIONS OF THOMAS DYE**

Across five decades, Thomas Dye has made substantial contributions to Hawaiian, Oceanic, and global archaeology in cultural resource management (CRM) and academic archaeology. Tom's research contributions have occurred throughout his varied career, providing a valuable model for archaeologists to contribute to the field from multiple positions: as an archaeologist at the Bernice P. Bishop Museum in Honolulu, an instructor at Hawai'i Pacific University and the University of Hawai'i at Mānoa, Historic Preservation Officer for the Republic of the Marshall Islands, as the O'ahu Island archaeologist for the Hawai'i State Historic Preservation Division, as a project director at a CRM firm, and as an owner and principal investigator of his own CRM company. He is best known for his more recent work building empirically grounded chronologies using Bayesian statistics and elements of graph theory. However, of equal importance has been his bottom-up, archaeologically informed analyses of social processes that have complemented and calibrated more frequent top-down approaches, as well as his championing of open science. This symposium celebrates Tom's contributions to archaeology, from his role in transforming how archaeologists in Oceania think about chronology to his contributions highlighting how the daily lives of individuals can provide important information on social process.

**[208] Symposium · CULINARY ARCHAEOLOGY**

The great strength of foodways archaeology has always been its breadth: methodologically, temporally, spatially, and topically. At the same time, the all-encompassing nature of foodways means that the term has become so diffuse that some of the scholarship has very little to do with food at all. This session proposes that archaeologists refocus on food and cooking under the banner of "culinary archaeology." This is envisaged as a holistic—though more circumscribed—archaeological study of food that is deeply informed by food history, experimental archaeology, ethnoarchaeology, and the embodied knowledge of cooking. This session invites archaeologists working in all time periods and regions to imagine what a culinary archaeology might look like by re-centering on the kitchen and the table, on cooking and eating.

**[209] Symposium · CRUCIAL ISSUES IN UNITED STATES DEPARTMENT OF DEFENSE CULTURAL RESOURCES MANAGEMENT**

*(SPONSORED BY MILITARY ARCHAEOLOGICAL RESOURCES STEWARDSHIP INTEREST GROUP)*

Stewardship responsibilities for large tracts of land with multiple groups of Indigenous inhabitants presents the United States Department of Defense (DoD) with unique opportunities and challenges. Universal priorities among cultural resource practitioners include generating meaningful interactions with our Tribal partners and addressing impacts of climate change on cultural and natural resources of import to Tribal communities. This symposium will be split into two parts to review these issues. Successful case studies from installations will provide best practices and templates for future work in these important areas.

**[210] Symposium · CURRENT RESEARCH ON ANCIENT GLASS AROUND THE INDIAN OCEAN**

Glass objects in the forms of containers, beads, or other personal ornaments are found all around the Indian Ocean. The circulation of these objects around the vast expanse of this geographical area reveals the connection of communities located in regions very far apart. Productions from the Middle East, Central Asia, South Asia, and Europe were identified along the east coast of Africa and in Southern Africa, two regions that have attracted more and more research interest over the past two decades. Shifts in procurement centers suggest changes in access due to possible political or economic events disrupting production and trade. Chronologies based on typology and glass chemistry have been established, making glass objects useful temporal markers along other archaeological artifacts such as ceramics. In this panel, recent research projects exploring glass production in India will be presented. Papers will focus their attention on glass ornaments in the Middle East, Southeast Asia, or Africa.

**[211] Symposium · PEDAGOGY IN THE UNDERGRADUATE ARCHAEOLOGY CLASSROOM**

For many students, the college or university classroom will be one of the first places they learn about archaeology as a field of study. Archaeological coursework prepares new anthropologists and archaeologists before they engage in fieldwork, lab work, and deeper study and helps potential future archaeologists to decide if the field is right for them. It also provides the college-educated public with an opportunity to engage with the human past, as well as to better understand what we do and why it is important. Thus, the work we do in the undergraduate classroom is some of the most important work we can do to shape the future of the field. This symposium brings together archaeologist educators teaching at all levels in two- and four-year institutions. Papers will explore evidence-based, innovative, and creative techniques for educating and engaging with a variety of student populations.

**[212] Symposium · ESTABLISHING THE SCIENCE OF PALEOLITHIC ARCHAEOLOGY: THE LEGACY OF HAROLD DIBBLE (1951–2018) PART II**

In a career spanning four decades, Harold Dibble's work had a profound impact on (1) the interpretation of Mousterian variability, (2) our understanding of lithic technology, (3) our evaluation of Neanderthal behavior, and (4) the methods we use to excavate Paleolithic sites. Underlying these contributions was his unwavering commitment to archaeology as a scientific endeavor. This commitment included hypothesis testing, quantification of data, statistical evaluation of results, and sharing of data. His legacy consists of a radically revised understanding of Neanderthal cultural behavior, where fire-making, symbolic burial, and language must be demonstrated, not assumed; a new science of lithic technology; and a clarification of the meaning of Mousterian industrial variability. His excavation methods have established a new standard for the field. At his untimely death in 2018, Dibble left behind a robust experimentation program; active field research that was producing new data on Neanderthal behavior; and countless colleagues and students pursuing groundbreaking work, inspired by his call for a rigorous scientific-based approach to archaeology. This session, part 2 of 2, brings together Dibble's students and colleagues to present new results and to reflect on his legacy and the way in which it has changed the future of Paleolithic archaeology.

**[213] Symposium · WARFARE AND THE ORIGINS OF POLITICAL CONTROL**

The relationship between warfare and the development of institutions of political control has been a fundamental issue in the humanities and social sciences since the inception of the disciplines. Since Confucius, Sun Tzu, and Plato, scholars have pondered how societies make wars and how wars make states. Over the last 75 years, historians, ethnographers, political scientists, sociologists, archaeologists, and bioarchaeologists have developed detailed histories of warfare and sociopolitical change in a wide range of time periods in nearly every region around the globe. The time is now ripe to develop a global understanding of sociopolitical change and human violence. This session will explore from diverse perspectives on the role that prehistoric and historic armed conflict played in the establishment, maintenance, and demise of political institutions in transegalitarian, status-based societies, and premodern states. We examine the material and nonmaterial causes of warfare, the organization of combatants, conflict and ideological signaling, and how leaders and followers created institutions of control in the context of escalating violence. To expand the multidisciplinary breadth, global scope, and theoretical depth of these issues, the session gathers together archaeologists, sociocultural anthropologists, and ethnohistorians working in Europe, Middle East, Asia, Oceania, and North, Central, and South America.

**[214] Symposium · ANIMAL RESOURCES IN EXPERIMENTAL ARCHAEOLOGY**

Experimental archaeological research using animal raw material resources (e.g., bone, teeth, skin, tendons, feathers, marine- and eggshell) is useful for developing an understanding of past human-animal relationships including subsistence strategies, tool manufacture and use, and artwork, as well as for understanding taphonomy, site formation processes, and population movements. Given their organic nature, biologically derived animal resources are highly variable and degrade over time, complicating the use of modern experiments as analogues for ancient processes. This session aims to present a diverse set of archaeological experiments, focused on incorporating and/or controlling for the inherent, anthropogenically modified, postmortem, or postdepositional variability of animal tissues. Exploring experimentation through a range of

themes, potential contributions may include raw material properties analyses, the influence of animal material states, sample preparation, curation and storage, taphonomic alterations, blind-tests, and methodological development and standardization (e.g., dating, isotopes, microscopy, use-wear, 3D modeling, FTIR). While experiments utilizing animal remains are an important analytical tool for archaeologists, we are particularly interested in contributions discussing the ethics of using animals in archaeological research. This broadly focused session will incorporate diverse perspectives and methodological approaches for evaluating past human activities including animal interactions.

**[215] Symposium · HILL PEOPLE: NEW RESEARCH ON TIJERAS CANYON AND THE EAST MOUNTAINS**

For decades, archaeological research in north-central New Mexico has focused on cultural developments in the Rio Grande Valley. With the notable exception of several long-term field school projects at Tijeras and Paa-ko pueblos, the diverse histories of populations living in the mountains east of Albuquerque—the “East Mountains”—have been overlooked or relegated to cultural resource management (CRM) reports. Alongside several ongoing reassessments of legacy collections from Tijeras and other East Mountain sites, a series of recent CRM, urban planning, and community history projects have generated new insights into the East Mountain region’s dynamic past. This session brings together people involved in these projects to share their discoveries, theories, and perspectives, with the goal of contributing to a more inclusive understanding of the complex human history of the East Mountains.

**[216] Symposium · CERAMICS AND ARCHAEOLOGICAL SCIENCES**

*(SPONSORED BY SOCIETY FOR ARCHAEOLOGICAL SCIENCES (SAS))*

Ceramics are one of humanity’s most durable products. The common geological presence, variability, and plasticity of their main ingredient—clay—and the additive nature of their manufacturing process have afforded humans remarkable creativity and space for social expression. People in separate parts of the world, at different times, in diverse social, economic, and ecological contexts have produced them in various fabrics (from earthenwares to porcelains) to satisfy needs that ranged from the quotidian to the cosmological. As a result, they are invaluable to archaeologists/archaeometrists for answering diverse research questions. Ceramic analyses examine the selection and preparation of raw materials; the manufacturing, firing, and decorative methods; and the shape, size, use, distribution, reuse, and discard of the final product, as well as decorative designs. Ceramic ecology and chaîne opératoire are guiding mid-range theoretical approaches, supported by archaeometric, geoarchaeological, and ethnoarchaeological methods. The goal of this new annual Society for American Archaeology symposium is to present and assess current ceramic research from around the world, at different scales, using varied methods and theoretical approaches. This new series is sponsored by the Society for Archaeological Sciences and continues a 35-year tradition of ceramic presentations at the American Anthropological Association meetings.

**[217] Symposium · SEEING MIGRANT AND DIASPORA COMMUNITIES ARCHAEOLOGICALLY: BEYOND THE CULTURAL FIXITY/FLUIDITY BINARY**

How do we “see” migrant and diaspora communities archaeologically over different time scales? We revisit an old debate over the tendency for archaeologists to approach this question as a binary: (1) by interpreting materials associated with migrant and diaspora communities as culturally distinguishable and distinct or (2) by interpreting materials associated with migrant and diaspora communities as unique cultural hybrids, shaped by both places of origin and present contexts. In relying on interpretive methodologies that are static and cyclical, resulting narratives often focus on a set of culturally determined material traits that overshadow the long-term, complex social processes that distinguish different communities. We ask participants in this session to critically examine and discuss the methodological assumptions that they rely on as they do archaeology of migrant and diaspora communities. In turn, we also ask them to discuss approaches that have aided them in breaking this pattern. What archaeological methodologies have allowed them to “see” migrant and diaspora communities and their associated material worlds in a more nuanced way—a way that leaves space for process, continual movement, individual autonomy, multidimensional social identities, and/or dynamic networks of exchange?

**[218] Symposium · RECENT ADVANCES IN ZOOARCHAEOLOGICAL METHODS***(SPONSORED BY ZOOARCHAEOLOGY INTEREST GROUP)*

Zooarchaeology stands at the crossroads of social and natural sciences by studying the relationships between human and nonhuman animals. From the onset, the discipline borrowed and adapted analytical tools from other fields; for example, to identify animal skeletal remains, document taphonomic processes, or inform animal behavior. Over the past 20 years, the use of stable and radiogenic isotopes, ancient DNA, geometric morphometrics (GMM), 3D imaging, data science, and proteomics, to name a few, has revolutionized the practice of zooarchaeology. These methodological advances have dramatically increased the range and scope of questions that zooarchaeology can address while deepening our understanding of past human/animal relationships. However, using these new techniques is not without its challenges, particularly concerning the reproducibility and accessibility of these methods. Costly equipment, state-of-the-art facilities, or large research budgets are often necessary, possibly restricting access to these approaches, particularly for our colleagues from the Global South. This symposium invites papers presenting the most recent advances in zooarchaeological methodology. We propose that the papers showcase how the latest analysis techniques are pushing the discipline forward while reflecting on how this work could be implemented and more accessible to underprivileged regions of the world.

**[219] Symposium · FROM HARD ROCK TO HEAVY METAL: METAL TOOL PRODUCTION AND USE BY INDIGENOUS HUNTER-GATHERERS IN NORTH AMERICA**

The study of tool production and use among Indigenous hunter-gatherer cultures in North America has traditionally focused on lithic analyses; however, there is a growing body of recent research and interest in the procurement, production, and use of metal implements by many of those same groups. Where metallurgical traditions have seen substantial research, they have been primarily studied through a culture history lens, with little attention paid to the procurement and manufacturing practices of metal objects or their subsequent use. Moreover, the decision-making involved throughout those processes deserves more systematic research. This session will focus on all aspects of Indigenous hunter-gatherer metal use, from procurement and practice to ideological and functional interpretive frameworks that place the use of a variety of metals into broader regional and interregional contexts. The diversity of research presented will have broader implications for how we conceptualize hunter-gatherer innovation, technological proficiency, and complex decision-making in the past.

**[220] Symposium · SOCIAL AND ENVIRONMENTAL INTERACTIONS ON COASTS AND ISLANDS IN KOREA**

Ecological and cultural settings along coasts and islands have provided archaeologists important data on the peopling of, migrations, cultural interactions and isolations, and niche constructions on oceanic spheres. Islands and coasts in Korea have been shaped by different environmental factors and cultural trajectories throughout the Holocene. This panel aims to discuss the recent data on human-ecological-social dynamics along the west, east, and southern coasts and islands in Korea from the early Holocene onward. Panelists will examine topics on foodways, landscape management, technological change, ideological reflections, and social interactions.

**[221] Forum · DECOLONIZING CURRICULUM IN ARCHAEOLOGY**

Are you interested in decolonizing your archaeology courses, syllabi, and/or curriculum? Or have you already taken steps toward a decolonizing approach and have ideas to share? If so, please join our conversation. This interactive forum is geared toward those teaching in higher education who are interested in making change or scaling up changes previously made. Discussants (both Indigenous and non-Indigenous) in different stages of their careers will address what it means to decolonize curricula and where to begin this process. They will share successful examples of field schools and lecture, lab, and seminar courses, including the challenges they encountered and how they addressed these challenges. Both discussants and participants will be invited to share their personal experiences, examples, and ideas. Let's learn from each other and leave this event inspired to make changes in our courses and curricula.

**[222] Symposium · DRINKING BEER IN A BLISSFUL MOOD: A GLOBAL ARCHAEOLOGY OF BEER**

“Drinking beer in a blissful mood. Drinking liquor feeling exhilarated.” This is one of the most well-known stanzas in the archaeology of beer, drawn from a Sumerian tavern song of the fourth millennium BCE in Mesopotamia, the birthplace of beer . . . or was it? Archaeological evidence of beer and brewing has been recovered from civilizations across the ancient world and over the course of millennia. From the corn-based chicha of the Wari and Inka Empires of South America, to the rice-based beers of Neolithic China, to Viking-era grogs across western Europe, as well as the early beers and eventual breweries of both ancient Egypt and Mesopotamia, beer is far from the monolithic fermented beverage often imagined today. Beer has been brewed as both a daily household beverage and as a large-scale festive brew. It has served as payment for labor, as well as an intercessor between people and deities. Beer is deeply ancient, vastly diverse, and a fascinating entry point into understandings of the ancient people who brewed and consumed this beverage. Through this session we explore the archaeological evidence of ancient beers and their brewers from a variety of ancient global contexts.

**[223] Symposium · FRYXELL SYMPOSIUM IN HONOR OF DOLORES PIPERNO**

*(SPONSORED BY FRYXELL AWARD, SAA)*

This symposium is in honor of Dolores Piperno in honor of her selection as the recipient of the Fryxell Award. In her introductory article and profile in the “Proceedings of the National Academy of Science” Dr. Piperno discussed the value of interdisciplinary research. She discussed employing multiple lines of evidence in order to create a more robust scientific argument. This dedication to data and scientific reasoning is a primary factor in the growing respect for her early research which challenged conventional thinking about early agriculture in the Americas. Dr. Piperno’s research has reached around the world, established a robust new science that is utilized by scientists both within and outside of archaeology, and pushed the boundaries of research in previously under-documented regions of the world. This has been a career of scientific firsts and dogged pursuit of the best evidence with which to construct our vision of the past.

**[224] General Session · IN FLUX: SETTLEMENT PATTERN STUDIES IN ARCHAEOLOGY PART II****[225] Symposium · SEEKING FREEDOM IN THE BORDERLANDS: ARCHAEOLOGICAL PERSPECTIVES ON MAROON SOCIETIES IN FLORIDA**

Over the past few decades, the archaeology of marronage has emerged as a distinctive subdiscipline exploring the material culture of freedom-seeking people resisting the institution of enslavement by living in the margins of colonial hegemony in the Americas. Much of the work in this area has been led by research in the Caribbean and South America, where large maroon communities developed and survived, maintaining a continuity of culture through descendants to the current day. In contrast, the major maroon communities of colonial and territorial Florida were effectively eliminated by the mid-nineteenth century and were often short-lived and ephemeral occupations, creating unique difficulties for archaeologists. Due to its geopolitical context, however, marronage in Florida was characterized by responses to enslavement not typically experienced elsewhere, with African-descendant people manning European military outposts, integrating with Indigenous communities, and developing expedient networks of communication and trade. This symposium will explore the unique characteristics and challenges of maroon archaeology in Florida with an intra-regional comparative approach, examining the recent research at some of the more significant sites in an effort to better understand the lost history of a freedom-seeking people.

**[226] Symposium · BODY MODIFICATION: EXAMPLES AND EXPLANATIONS**

Permanent body modification (PBM) is among the most striking of contemporary human behaviors, and there is evidence that it has been practiced for thousands of years. However, to date, PBM has been the subject of comparatively little anthropological and archaeological research. Consequently, it is poorly understood. The present session will feature talks based on papers from a forthcoming edited volume that seeks to change this state of affairs. The talks will discuss examples of PBM practices that have been carried out in different places and at different times, including tattooing, scarification, piercing, dental modification, and finger amputation.

Proximate and ultimate reasons why individuals are motivated to engage in PBM practices will also be considered in the course of the session.

**[227] General Session · EXAMINING VIOLENCE, WARFARE, AND COERCION THROUGH SPACE AND MATERIAL CULTURE PART II**

**[228] General Session · TRACKING POPULATIONS, RESOURCES, AND KNOWLEDGE ACROSS SPACE AND TIME PART II**

**[229] General Session · EDUCATION, ETHICS, AND ENDLESS SHELVES: STUDIES IN ARCHAEOLOGICAL COLLECTIONS, CURATION, AND MUSEUMS PART II**

**[230] General Session · IMBUING MEANING: SACRED LANDSCAPES AND SITES**

**[231] Forum · HOW DOES THE NEW FEDERAL AUTHORITY FOR DISPOSAL OF CERTAIN ARCHAEOLOGICAL MATERIAL REMAINS WORK AND HOW WILL IT AFFECT COLLECTIONS MANAGEMENT?**

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

Federal agencies, as all collections owners, have long faced challenges in leveraging funds and space to care for archaeological collections. To address this collections management issue, the National Park Service has finalized regulations to allow disposition of federally owned archaeological material remains determined to be of insufficient archaeological interest. The rule amends CFR 36 Part 79 - Curation of Federally-Owned and Administered Archaeological Collections and went into effect on May 16, 2022. It provides agencies with a procedure to remove from collections a limited variety of objects that are determined to be “of insufficient archaeological interest” by meeting specific criteria. No human remains, NAGPRA cultural items, or associated records may be disposed of under this rule. It includes safeguards for protection of the research value of collections, including consultation with a Collections Advisory Committee; notification of interested parties, including State and Tribal Historic Preservation Offices and interested universities; publishing information about the proposed disposition in the Federal Register; and the ability to object to a Federal Agency official’s determination to dispose of particular material remains. This discussion will focus on the effects this regulation may have on federal and other archaeological collections, curatorial practices, and archaeological research.

**[232] General Session · EXPERIENTIAL LEARNING, EXPERIMENTAL ARCHAEOLOGIES**

**[233] Symposium · POLITICAL GEOLOGIES IN THE ANCIENT AND RECENT PASTS: ONTOLOGY, KNOWLEDGE, AND AFFECT**

This session traces political geologies in the recent and ancient pasts to unsettle how archaeologists grapple with landscape, earthly materials, and politics. How is the practice of geology political? In what ways do earthly materials co-create politics? Recent scholarship has queried (1) Western knowledge production in the earth sciences as well as (2) the ontology, affect, and agency of geological materials. Political geology emphasizes that knowledge about and the categorization of earthly materials is always rooted in particular historic and ontological frameworks. Scientific practice frames, selects, and excludes certain materials, reflecting particular political projects. Simultaneously, anthropologists and geographers have documented the meaningful roles that geomaterials have in social life cross-culturally, while also revealing ontological equivocations between discrete communities. At issue are the multiple perspectives on what geomaterials are and who has the power to define, utilize, consult, and protect them. In what ways do archaeological ceramics, metals, stone objects and architecture, and agricultural landscapes—consisting of specific technologies and geological know-how—represent “partial connections” and political ontologies? What kinds of frameworks can help us better understand and describe ontological and political conflicts as gleaned through archaeology? Thinking through such questions may lead to a more representative and equitable archaeology.

**[234] General Session · AT THE INTERSECTIONS OF COMMUNITY, REGULATION, AND DEVELOPMENT: CONVERSATIONS IN HISTORIC PRESERVATION AND MANAGEMENT PART IV**

**[235] General Session · ARCHAEOLOGICAL STUDIES OF HUMAN-ENVIRONMENT RELATIONSHIPS PART IV**

**[236] Symposium · LA CUERNAVILLA, GUATEMALA: A MAYA FORTRESS AND ITS ENVIRONS**

In 2017, data from the Pacunam Lidar Initiative revealed a previously undetected Maya fortress situated at the edge of a steep limestone escarpment binding the northern edge of the Buenavista Valley, running between the ancient kingdoms of El Zotz and Tikal. The site, named La Cuernavilla, occupies two adjacent hilltops and some of the foothills below. It is protected by concentric rings of massive defensive systems at a scale and intensity previously unattested for the Maya Lowlands. Initial reconnaissance recorded the distinctive Teotihuacan talud-tablero architectural style in one of La Cuernavilla's temples, suggesting a connection to the important 378 CE entrada during which Tikal's ruler was assassinated and replaced by an invading party from Central Mexico. Initial test excavations indicated a deeper and more complex history that provoked a more intensive investigation of the fortress in 2021 and 2022. The goals of the research at La Cuernavilla were to understand the site's emergence and growth in relation to its local and regional environs, as well as its place within broader geopolitical machinations in the Buenavista Valley and the Maya Lowlands as a whole. The papers in this session report the most recent results from the research at La Cuernavilla.

**[237] Symposium · FINDING COMMUNITY IN THE PAST AND PRESENT THROUGH THE 2022 PARCC FIELD SCHOOL AT BUEN SUCESO, ECUADOR**

Ethical archaeological practice is driven by theory; thus archaeological field schools should also espouse a clear theoretical framework at the outset, particularly as concerning collaboration with and expectations of students, community members, and project leaders (Borck 2018; Cipolla et al. 2019; Clarke and Phillips 2012; Gonzalez and Edwards 2020). The Proyecto Arqueológico Rios Culebra-Colin 2022 field school applied an anarchical approach to both the past and present by avoiding assumptions of the necessity of hierarchy or organized power. To execute this vision, students helped create and agreed upon codes of conduct, participated in many aspects of fieldwork (excavation, total station mapping, lab work, community consultation, etc.), and were central to the ongoing archaeological knowledge production even after the digging was done. This session highlights the results of this approach by presenting (1) the archaeological findings from Buen Suceso, a multicomponent site in coastal Ecuador and the focus of our 2022 field excavations; (2) results from community heritage work with local Dos Mangas residents; and (3) student reflections on the field school experience. By presenting these papers in one symposium, we emphasize the interconnectivity of these activities, rather than seeing them as siloed or of ranked importance in the archaeological endeavor.

**[238] Symposium · A CELEBRATION AND CRITICAL ASSESSMENT OF THE MAYA SCRIBE AND HIS WORLD ON ITS FIFTIETH ANNIVERSARY**

This landmark publication written by Michael D. Coe and published by the Grolier Club in 1973 was in many ways a catalyst for subsequent advances made in ancient Maya art and writing over the past five decades. Despite its many important contributions, including the first publication of the precolumbian book now known as the "Códice Maya de México," the Grolier exhibition was at the center of a heated debate regarding the display and publication of unprovenanced Maya objects. This debate continues, fueled by the continued looting of archaeological sites and the commodification of ancient Maya materials. Ongoing debates delve on the proper ways to weigh the benefits of scholarship against its potential impact on the commercial value of objects, the use and management of "orphaned objects" by scholars and museums, and questions related to repatriation, among others. This session will highlight the contributions of this important milestone in Maya studies and offer critical assessments of the problematic issues surrounding the Grolier exhibition and its outcomes, which are of central concern to Maya archaeologists, epigraphers, and art historians.

**[239] Symposium · FIRE-CRACKED ROCK: RESEARCH IN COOKING AND NONCOOKING CONTEXTS**

Although fire-cracked rock (FCR) is found in significant quantities at sites worldwide, this analytical artifact type remains understudied in archaeological research. FCR is the byproduct of the use of rocks for heat storage or transference. Accordingly, FCR is frequently recovered in association with features that represent the physical remains of past cooking or heating facilities. For example, FCR was commonly used in domestic facilities to cook food (e.g., stone boiling, earth oven) and in noncooking facilities, such as to provide heat in shelters (e.g., sweat lodge) and to melt snow for drinking water. This symposium brings together scholars employing various approaches to study and interpret FCR across different regions and time periods. The papers highlight the important contributions emerging from a variety of perspectives and methods (e.g., ethnographic, experimental) being applied to investigate FCR created by natural (e.g., wildfires) and cultural processes, as well as to better contextualize its role in past feature formation, midden accumulation, and domestic life.

**[240] Symposium · THE LATE MIDDLE PALEOLITHIC IN THE WESTERN BALKANS: RESULTS FROM RECENT EXCAVATIONS AT CRVENA STIJENA, MONTENEGRO**

The rockshelter of Crvena Stijena, Montenegro, is well-known as a key Paleolithic site in the Balkan peninsula. Its 20 m deep sequence, over half of which spans the Middle Paleolithic, contains lithic industries, abundant macrofauna bearing extensive traces of human butchery activities, and large combustion features. A new excavation project, led by the University of Minnesota and the National Museum of Montenegro since 2017, has focused on the Middle Paleolithic levels with an emphasis on documenting fire use by Neanderthals. A number of analyses have been carried out in order to understand pyrotechnological behaviors, reconstruct site formation processes, and reconstruct paleoenvironments. These include anthracology, micromorphology, archaeomagnetism, and chemical characterization of minerals (in artifacts and in sediments) altered by fire. Paleoenvironmental reconstruction has been accomplished through analysis of macrobotanical remains, plant alkanes, and microfauna. Neanderthal stone-tool making and using behaviors have been studied through raw material analysis and residue analysis. Refinement of the site chronology continues through a new radiocarbon dating program as well as cryptotephrochronology. Genetic analyses have extracted hominin DNA from sediments in the site. This symposium brings together the specialists who have contributed to the project since 2017 to present their results and allow for discussion and synthesis.

**[241] Symposium · INTERDISCIPLINARY APPROACHES TO ROCK ART DOCUMENTATION, RESEARCH, AND ANALYSIS**

*(SPONSORED BY ROCK ART INTEREST GROUP)*

Current rock art research is interdisciplinary, drawing methods from various fields and knowledge from multiple lines of evidence. These approaches augment and enhance rock art documentation, offer new strategies for effective site management, and facilitate new interpretive insights for rock art provinces around the world. This Rock Art Interest Group-sponsored session provides a forum to share recent rock art research from a wide range of topics that help us to better understand and contextualize rock art, including geochemical analyses, iconographic comparisons, photogrammetric and imaging techniques, Indigenous knowledge, spatial analysis, and radiocarbon dating. The presentations in this symposium discuss rock art in California, Hawaii, Texas, the American Southwest, the Great Plains, the Eastern Woodlands, Mexico, Israel, and Siberia.

**[242] Symposium · THE VIBRANCY OF RUINS: RUINATION STUDIES IN ANCIENT MESOAMERICA**

The purpose of this symposium is to generate discussions on the ways in which ruined and decaying buildings contributed to the ongoing constitution of communities in ancient Mesoamerica. Symposium participants will use archaeological and historical data and recent ideas advanced by ruination studies and the material turn to examine the life history of ruins in precolumbian times and their relations to the materiality of community. Ruination studies recognize that ruins persist and can affect people long after buildings fall to ruin. The material turn focuses on the durability and ever-changing materiality of ruins and their active role in relations with people in ways that can both facilitate and disrupt human projects. This symposium will bring together a

group of scholars to challenge a Western/Romantic view of ancient Mesoamerican ruins as deserted spaces, devoid of vibrancy and meaning for precolumbian Indigenous peoples. The participants in this session will offer a glimpse of an Indigenous perspective on ruins, where ruins were places that were important in the constitution of community life and sources of cultural identity in ancient Mesoamerica.

**[243] Symposium · HOUSEHOLDS AT AVENTURA: LIFE AND COMMUNITY LONGEVITY AT AN ANCIENT MAYA CITY**

How can people create communities that are long-lived? This is the overarching research question that drives the Aventura Archaeology Project's investigations at Aventura, Belize, which has been a place of human activity for over 5,000 years, from the Late Archaic to historic and contemporary periods. In this session, we focus on a part of Aventura's long history, the households of the ancient Maya city of Aventura. We present new excavation, survey, lidar, and analytical research designed to address sociopolitical, economic, and environmental issues related to Aventura's long-term history. From 2014 to 2023, project members investigated 12 households across a 1 km<sup>2</sup> area around the city, revealing new information about the diversity and daily lives of residents and the role they played in maintaining and shaping their community over the long term. We highlight Aventura's households during the Middle to Late Classic population maximum as well as those in the smaller Terminal Classic and Postclassic communities. We conclude by considering how questions of households and community longevity are as central for building collaborative archaeologies with local communities and addressing questions relevant to the contemporary world as they are for understanding the past.

**[244] Symposium · FROM THE ALTAI TO THE ARCTIC: NEW RESULTS AND NEW DIRECTIONS IN THE ARCHAEOLOGY OF NORTH AND INNER ASIA**

The archaeology and anthropology of northern Eurasia tends to proceed from its filleting into three massive continent-spanning strips—the terrestrial biomes of the steppe, the taiga, and the tundra—with certain nods to the gradations between them, other vegetation communities biting in from the south, and the separate world of its marine fringes. This session brings together researchers of Mongolia, steppic and montane Central Asia, Siberia, and maritime Northeast Asia to break well out of this conventional siloing. With perspectives and toolkits spanning monumental iconography, genome-wide ancient DNA, textile analysis, historical linguistics, osteoarchaeology, ceramic geochemistry, and beyond, we highlight both the diversity of practices and trajectories accommodated within each zone and shared inheritances and channels of connection that cut far across ecologies and latitudes. In grasslands, uplands, boreal forests, wetlands, and the shores of cold seas, we draw out the heterogeneity, surprising parallels, crackling interfaces, and repeatedly refreshed links that have enmeshed this vast region for millennia.

**[245] Symposium · DOGS IN THE ARCHAEOLOGICAL RECORD**

Dogs have played a critical role in human societies since their domestication. Our symposium explores dogs in the archaeological record from a worldwide perspective, utilizing methods such as ancient DNA and stable isotope analyses, ethnography, and osteobiography.

**[246] Symposium · CORDAGE, YARN, AND ASSOCIATED PARAPHERNALIA  
(SPONSORED BY FIBER / PERISHABLES INTEREST GROUP)**

Cordage and yarn are typically the earliest fiber technologies to develop in ancient societies, and this development tends to quickly lead to a plethora of further technologies, forming the basis of most constructed interworked fibrous elements, such as basketry, sandals, and twined textiles, and then the vast majority of woven fabrics. Nevertheless, cordage and yarn have also continued to exist and function independently of textiles in a wide variety of roles, including rope and string for wrapping and binding, rigging, nets, torques, belts, and quipus; composite weapons, from slings and harpoons to the crossbow, also rely on cordage. In contexts where textiles no longer survive, the presence of cordage and yarn technology is revealed by the presence of tools, including different types of spindles and whorls, rope spinners, and netting gauges, and by the presence of other associated paraphernalia, including suspended objects, net weights, cleats, and moorings. This symposium explores the enduring presence, function, and meaning of cordage, yarn, and associated tools and paraphernalia in ancient through contemporary societies worldwide.

**[247] Symposium · ADVANCES IN PUEBLA/TLAXCALA ARCHAEOLOGY**

The Puebla/Tlaxcala valley has often been characterized as a crossroads connecting the Gulf Coast, the Basin of Mexico, and the southern highlands of Oaxaca. As such, it has been a cultural palimpsest over its long history with influences from many areas and a hub for long-distance trade. Nevertheless, research in Puebla/Tlaxcala has lagged behind neighboring regions. Thankfully, however, archaeological (and other) investigations have increased in recent years, such that important new discoveries and interpretations are being made. Papers in this session will sample some of the diverse research programs currently underway, including investigations in the Cholula ceremonial center, Postclassic and colonial period excavations in Puebla city and Tlaxcala, art historical interpretations of relevant pictorial manuscripts, and carved human skulls from southern Puebla and Oaxaca. The goal of this session is to introduce recent advances as well as promote dialogue among active researchers and the audience.

**[248] Symposium · APPROACHES TO ARCHAEOLOGICAL FOOTWEAR**

Evidence deriving from changes in the architecture of the human foot suggests that footwear has been an important component of human technology for at least that last 50,000 years. Beyond becoming a signature feature of dress and adornment in many cultures, footwear has also played an underappreciated role in human mobility and the colonization of diverse biomes. Footwear, including diverse forms such as sandals, slippers, moccasins, and shoes, has historically been neglected in archaeological research, however, in favor of other classes of material culture. This is largely due to footwear's perishability and the challenges to classification posed by their formal and structural variability. Despite these limitations, prior research demonstrates the potential of ancient foot dressing practices to contribute to archaeological questions relating to ancient economies, long-term technological change and innovation, social boundaries and identities, individual- and population-level health and demography, and population movement, among other things. The primary goal of this session is to integrate often disparate threads of research involving different types of ancient footwear, as well as different methodological and theoretical approaches, to highlight the potential of such items for addressing a wide range of anthropological questions and articulate pathways for future research on archaeological footwear.

**[249] General Session · FROM THE MONUMENTAL TO THE MINUTE: ARCHITECTURE AND THE BUILT ENVIRONMENT PART II****[250] General Session · QUANTITATIVE METHOD AND THEORY IN ARCHAEOLOGY****[251] Symposium · LIFE AND DEATH IN MEDIEVAL POLAND**

Archaeological and osteological studies focused on populations in Medieval Poland (tenth–sixteenth centuries) remain underrepresented as we move through the third decade of this new millennium. This is especially true for studies focused on the lives of people, a subject that is more generally overlooked by historical sources. With advances in methods and technology, both archaeologists and bioarchaeologists are better equipped to answer complex questions about genetic population structure, health, stress, diet, behavior, and social structure. A synthesis of historical, archaeological, and biological data is crucial in developing a holistic view of the human experience in the past. This symposium will present current research related to these topics in the context of the High Medieval site of Giecz, and the Late Medieval sites of Gać and Dzwonowo. Although the two sites are very different in temporal and cultural context, the theme of the symposium is centered on how archaeological and osteological information can provide insight on the lives of people in Poland both during the periods of state development and the established Kingdom of Poland. The papers presented will address important and understudied topics such as studies applied to women and children, social status, urbanization, and population history.

**[252] General Session · ISOTOPE STUDIES IN THE OLD AND NEW WORLDS PART II**

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

### **Abdolhazadeh, Aylar (Arizona State University)**

**[168]**

*To What Extent Is the Concept of Convergence Applicable to Lithic Technology: An Overview*

For many Paleolithic archaeologists, it is important to determine whether similar characteristics of lithic artifacts and/or assemblages resulted from convergent evolution because this may help us better understand the evolutionary developments of stone artifact technologies from *H. habilis* to *H. sapiens*. In this respect, similarity and variation in lithic artifacts has been examined from perspectives such as cultural-historical and functional-evolutionary models. Additionally, actualistic and controlled experiments have improved our understanding of flake formation and mechanical processes of making lithics; these show that manufacturing sequences, raw materials, fracture mechanics, taphonomic processes, and environmental constraints had major impacts on causing variation and/or creating similarities in the shape and size of lithic artifacts. It is still, however, not clear to what extent such variables affect how we recognize convergence in lithic assemblages. This paper will review and discuss some of the difficulties in recognizing “convergence” (i.e., similarity that is independent of traditions) in lithic artifacts with a goal of understanding the feasibility of applying the concept of convergence to lithic artifacts and assemblages. To achieve this, this paper presents some examples of lithic assemblages from Europe, Southwest Asia, and Africa.

Abplanalp, Jenn [94] see Wescott, Konnie

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

**[210]**

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

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

Abraham, Shinu Anna [210] see Fenn, Thomas

Acosta-Ochoa, Guillermo [54] see Cordova, Carlos

Acosta-Ochoa, Guillermo [20] see McClung de Tapia, Emily

Acosta-Ochoa, Guillermo [241] see Menéndez Iglesias, Beatriz

*Presentations and posters that were officially withdrawn by March 1, 2023, the advance registration deadline, have been marked as [WITHDRAWN] in the Individual Abstracts; however, these presentation/poster placeholders will still appear in the Final Program. Updated information regarding withdrawals will be provided in Daily Digest email/app updates during the meeting.*

**Adam, Manda, Iyaxel Cojti-Ren (University of Texas, Austin) and Fred Valdez (University of Texas, Austin)****[228]***The Social Transformation of the Terminal Classic Maya to Postclassic Maya in Northern Belize*

The Terminal Classic (AD 800–1000) and Postclassic (AD 1000–1500) periods of Maya civilization in northern Belize were times of significant change and social transformation. Changes and developments during the Terminal Classic are visible archaeologically at several northern Belizean communities including Colha, Lamanai, and La Milpa. We evaluate changes at these Maya-communities based on shifts in material culture such as lithics, ceramics, and faunal remains, finding different use and procurement of these resources. Our results contribute to three primary areas of interest: 1) the aftermath of societal collapse; 2) memory and its role in social change and transformations; 3) daily life and identifying its effects on social change and political transformation. The pattern of adaptations and transformations in northern Belize during the Terminal and Postclassic parallel the developmental trajectories in other regions of the ancient lowland Maya during these periods of transition.

Adam, Manda [73] see Ortiz, Esequiel

Adam, Manda [73] see Schraub, Austin

Adams, Gregg [94] see Oppenheimer, Jonas

**Adán, Leonor (Universidad Austral de Chile), Mauricio Uribe (Universidad de Chile) and Simón Urbina (Universidad Austral de Chile)****[12]***Las sociedades prehispánicas de la costa de Tarapacá en el contexto del Colesuyu (950–1540 dC)*

Este trabajo expone el análisis arqueológico de los asentamientos y arquitectura registrados en la costa de Tarapacá, norte de Chile, durante los períodos Intermedio Tardío y Tardío (950–1540 dC). Los sitios estudiados comprenden el litoral entre Pisagua e Iquique hasta la desembocadura del río Loa, los que forman parte del Complejo Cultural Pica-Tarapacá. El análisis arquitectónico y funcional, complementariamente, es integrado con registros de distintos materiales y antecedentes pertenecientes a colecciones de museos. La discusión de estas líneas de evidencia permiten: (1) caracterizar la expresión costera de un complejo cultural particular de los Andes Centro Sur, en el sector hiper-árido del Desierto de Atacama; (2) evaluar los modelos socioeconómicos y de eco-complementariedad propuestos, confrontando los planteamientos sobre enclaves o colonias con aquellos de un sistema horizontal en el marco del Colesuyu; y (3) proponer la existencia de patrones culturales regionales distintivos y su génesis local en los períodos precedentes (Arcaico y Formativo). Las conclusiones apuntan a sociedades de ancestro costero que explotan autónoma y segmentadamente la costa y su espacio marítimo mediante asentamientos residenciales de distinta envergadura que son el resultado de lógicas económicas y de movilidad diferenciales, alcanzando territorios y poblaciones establecidas en valles litorales como en oasis interiores.

Addison, David [207] see Quintus, Seth

**Adler, Daniel (University of Connecticut), Keith Wilkinson, Jenni Sherriff (King's College London), Mark Sier (University of Oxford) and Boris Gasparyan (Institute of Archaeology and Ethnography, Armenia)****[56]***The Early–Middle Pleistocene Settlement of Northern Armenia*

Northern Armenia and southern Georgia, divided in the HaghTanak-Bagratashen area by the Debed River, witnessed considerable volcanic activity between ~2.1 and 1.6 Ma, toward the end of which the earliest evidence of *Homo* outside Africa is found at Dmanisi. The rich assemblages of lithic, faunal, and human fossil

materials found at Dmanisi date to ~1.77 Ma and have fundamentally altered our understanding of the hominin morphological attributes and technological capabilities upon which this hominin expansion was based. Thus, the region is now well established as an important archive of early paleoanthropological data. Recent research conducted at Haghtanak-3 (HAG3) suggests that the base of its stratigraphic sequence may be coeval with Dmanisi as it sits atop a 1.95 Ma basalt flow and unifacial core/choppers, non-hierarchical cores, simple flakes, and hard hammer percussion dominate the artifact assemblage. Therefore, a combination of chronological, stratigraphic, and archaeological parallels exists between Dmanisi and HAG3, providing an opportunity to expand our understanding of the earliest expansion of *Homo* out of Africa with new, highly contextualized geoarchaeological and paleoenvironmental data. HAG3 also contains a stratigraphic sequence that continues into the Middle Pleistocene, thus providing detailed information on later phases of technological development and hominin behavior.

Adler, Daniel [56] see Gasparian, Boris

Adler, Daniel [56] see Gill, Jayson

Adler, Daniel [56] see Kovach, Tanner

**Adler, Michael (Southern Methodist University) and Michelle Hegmon (Arizona State University)**

**[90]**

*Comparative Histories of Community Depopulation in the Mesa Verde and Northern Rio Grande Regions of the American Southwest*

Architecture, artifact deposition patterning, and oral traditional information are brought to bear on questions of settlement depopulation, migration and relocation, and social conditions surrounding the depopulation of two large Ancestral Pueblo settlements. One large village, Sand Canyon Pueblo, was depopulated in the late thirteenth century as part of the out-migration of Ancestral Pueblo peoples from the central Mesa Verde region, while Pot Creek Pueblo, located in the northern Rio Grande region, was depopulated in the early fourteenth century. Contrasting patterns of artifact deposition, treatment of architectural spaces, and levels of social conflict all point to different modes of settlement depopulation and subsequent migration to other regions of the American Southwest.

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

**[61]**

*Discussant*

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

**[148]**

*Meadowcroft Rockshelter 2023: Revisit*

The year 2023 marks the 50th anniversary of initiation of excavations at Meadowcroft Rockshelter in southwestern Pennsylvania. Meadowcroft was the first serious challenge to the Clovis-first peopling model that had dominated American archaeological thought for decades. Generations of students have passed through graduate schools since the early excavations at Meadowcroft and most, regrettably, have never read any of the primary literature on the site. This paper summarizes the salient aspects of the prehistoric record from Meadowcroft Rockshelter and discusses the role(s) it has played in the history of American archaeology.

Adriano-Morán, Carmen Cristina [20] see McClung de Tapia, Emily

**Agardy, Savanna****[234]***Interpreting Spotten Cave, a Mid-Archaic to Ethnohistoric Rockshelter Site, to Utah's Public*

The public interpretation of archaeological sites is crucial to the understanding, appreciation, stewardship, and preservation of archaeology by the public. Significant archaeological sites, such as the privately-owned Spotten Cave, a prehistoric rockshelter site in Utah County, should be interpreted to the public even if they have an uncertain future. Uncertain futures are defined as not being protected by federal or state law, nor are they publicly accessible, and some face the possibility of destruction in the future. Due to these challenges, public interpretation is generally not developed for archaeological sites in these scenarios despite their significance. This project aims to address this gap by researching public interpretation methods for archaeological sites along with how the public benefits from archaeological interpretation. The project also includes the development of an archaeological context for Spotten Cave using data derived from previous archaeological research and supplementary fieldwork, lab work, and informal interviews. These components combine key elements to make several recommendations for the public interpretation of Spotten Cave based on possible future scenarios. This project contributes to the heritage field by exploring public interpretation for sites with uncertain futures, a topic that is scarcely available in the existing literature.

**Agbe-Davies, Anna (UNC-Chapel Hill)****[188]***Discussant***Agbe-Davies, Anna (UNC-Chapel Hill)****[138]***Making Race Women: Intellectual and Material Contributions to Understanding Black Lives in the Early Twentieth Century*

One powerful reason to integrate Black Studies and archaeology is to align archaeological analysis of sites occupied by Black people with the aims, imperatives, and perspectives that their descendants and other stakeholders might find relevant. This paper follows the lead of researchers like Brittney Cooper who encourage us to see Black people in the early twentieth century not only as subjects but as scholars, analysts, and public intellectuals whose work can help provide the theoretical basis for understanding their times. Pauli Murray and Elizabeth Lindsay Davis are among the theorists whose work has helped guide my thinking about the material, everyday practice of citizenship among Black Americans in the early twentieth century.

Aguayo, Emilio [200] see Ávila, Claudia

**Aguayo Ortiz, Elaine, Arion Mayes, Arthur Joyce and Akira Ichikawa****[102]***A Mortuary Analysis of Adult and Child Burials of Río Viejo, Oaxaca, Mexico*

Mortuary practices are symbolically charged activities that vary depending on wealth, religion, manner of death, and even age. Recent excavations of the site of Río Viejo, Oaxaca, Mexico, suggest similar burial practices between adults and children during the Early Postclassic (AD 800–1100) and Late Classic (AD 500–800). The current understanding of burial practices between adults and subadults in Río Viejo has differed according to the location of burials, the position of the bodies, and associated offerings. Here, 10 Early Postclassic and 11 Late Classic burials are examined to identify patterns in burial practices by utilizing both *The Standards* and Arturo Romano's burial system. Preliminary data reveals adult burials are spatially incorporated into households whereas children were found outside of these structures. This is important because understanding Río Viejo's burial practices can be insightful to social relations of adults versus children while also respecting their individuality and giving voice to the burials.

**Aguilera, Nelson (Autonomous University of Barcelona), Albert Garcia-Piquer (Autonomous University of Barcelona) and Raquel Pique (Autonomous University of Barcelona)**  
[92]

*Kančič: Indigenous Seafaring, Watercraft Diversity, and Cultural Contact in Southern Patagonia*

Human adaptation to (and building of) watery environments is a phenomenon of growing interest for archaeology and anthropology. It is an aspect that has been related to forms of economic production and the derivations of the evolution of forms of transportation and mobility in past societies. But seafaring also affected how human groups related to other ethnic groups and how they constructed their relationship with the landscape-waterscape. One main problem in the study of Indigenous seafaring is the lack of direct material evidence. For historical times, this information can be critically inferred from chronicles and travelers' accounts. This paper presents the results of the spatiotemporal analysis of 1,046 sightings of Indigenous canoes recorded in written sources from 1520 onward, in which descriptions of the canoe cultures of Southern Patagonia are recorded. We find significant diversity in Indigenous watercraft and seafaring since the eighteenth century linked to processes of cultural contact, and possible relationships with Indigenous migratory processes originating in Northern Patagonia. We analyze the introduction of new watercraft technology in the region and evaluate its impact on hunter-gatherer organizational strategies and the relationships with the waterscape of Southern Patagonia, traditionally built around the bark canoe.

Aguilar-Meléndez, Araceli [223] see Chiou, Katherine

Agurcia Fasquelle, Ricardo [234] see Traxler, Loa

**Ahern, James (University of Wyoming), Ivor Jankovic (Institute for Anthropological Research, Zagreb), Darko Komšo (Archaeological Museum of Istria), Siniša Radovic (Institute for Quaternary Geology and Paleontology) and Rory Becker (Eastern Oregon University)**  
[47]

*Insights into the Late Upper Paleolithic of the Northern Adriatic from Ljubičeva Cave, Istria*

This paper presents the results of past and recent systematic research on the late Upper Paleolithic carried out in Ljubičeva Cave near Marčana, Croatia. The first excavations of the site occurred between 2008 and 2011 and yielded late Upper Paleolithic as well as Neolithic and Bronze Age discoveries. Since 2019, systematic archaeological exploration of the site has continued as part of the Croatian Science Foundation interdisciplinary project PREHISTRIA (grant no. IP-2019-04-7821). Based on the results of the radiometric dating of part of the layers, humans used the site twice during the Pleistocene, between 13,330 and 13,120 cal BP and 16,120 and 15,670 cal BP, respectively. The dating, combined with the lithic finds, points to the Late Epigravettian period ( $\approx 17,500$ – $11,700$  cal BP). The Late Epigravettian material found includes numerous remains of Pleistocene fauna, lithic industry, traces of burning, pieces of ochre, and other findings including some fragmentary human remains. Enhancing standard archaeological approaches, geophysical, sediment DNA, ZooMS, and large-scale 3D scanning, among other techniques, are expanding our understanding of the Late Epigravettian lifeways in the Northern Adriatic.

Ahern, James [47] see Becker, Rory

Ahern, James [47] see Jankovic, Ivor

**Ahern, Kaitlin (University at Buffalo; New South Associates Inc.)**  
[9]

*Caches, Memory, and Ritual at the Maya City of Cival*

In 2013 and 2014, a series of excavations were conducted on Structure 9 at the Preclassic period center of Cival. Structure 9 is the western radial pyramid associated with the site's central E-Group complex. These excavations uncovered a series of caches, termination rituals, and deliberate destruction of architectural

features across five major phases of construction for Structure 9. This presentation utilizes the theories of social memory and sacred place to provide insight into the ritual activities associated with this structure. It also draws upon previous ritual activities conducted in the Central E-Group plaza and the site's broader history to obtain a more comprehensive understanding of the role of this complex as a sacred place and hub of memory at Cival.

Ahlman, Kathryn [95] see Ahlman, Todd

**Ahlman, Todd (Texas State University), Ashley McKeown (Texas State University), Kallista Karastamatis (Texas State University) and Kathryn Ahlman (New Braunfels High School) [95]**

*Methodological Perspectives in the Search for Maroon Settlements on St. Croix, US Virgin Islands*

During the eighteenth and early nineteenth century, formerly enslaved Crucians self-liberated and developed a community in St. Croix's northwest hills. These rugged hills provided an ideal location for self-liberated Crucians (Maroons) to avoid detection and establish settlements. Our recent pilot study survey used a combination of lidar and environmental data to develop an archaeological predictive model to identify where these habitation sites may be located. We employed pedestrian survey and metal detecting to investigate these locations and test the efficacy of the predictive model. As we examined the lidar data further, we found numerous small, relatively flat locations that could have served as habitation locations and focused our survey on these locales, partly because of the rugged and treacherous nature of the northwest hills. Our survey found three promising locations and the preliminary results indicate that St. Croix's Maroons utilized a variety of environmental and landscape features in selecting locations to live in this region. This paper examines the use of predictive models in identifying Maroon sites and how traditional survey methodologies likely will not find Maroon settlements on St. Croix.

Ahlrichs, Robert [232] see Sterner, Katherine

**Aimers, Jim (SUNY Geneseo) and Elizabeth Graham (University College London) [11]**

*Stylistic and Cultural Change at a Cosmopolitan Site: The Early Postclassic Period Pottery of Lamanai and Northern Belize*

The Maya site of Lamanai is strategically located in northern Belize on the New River, which connects the Caribbean coast to the interior of the Maya area. In the Preclassic period into the early part of the Classic, Lamanai pottery shows close connections to the Belize Valley and the Petén of Guatemala. But, in the later part of the Classic and into the Postclassic, Lamanai pottery shows increasing stylistic connections to the northern Maya lowlands and the coasts, including the Gulf Coast. In this paper we explore some of these stylistic connections and what they suggest about interregional interaction and its consequences in the Terminal Classic and Postclassic periods.

Ainis, Amira [71] see Jazwa, Christopher

Ainsworth, Caitlin [76] see Judkins, Abigail

**Airola, Danielle****[181]***Anthropology on Social Media*

This poster asks a question: how can we use social media to talk about anthropology and archaeology? To answer this question, we will explore different social media platforms and how to use them. Platforms covered will include Instagram, YouTube, Twitter, and TikTok. It will also discuss best practices on social media and draw on how-to articles, scholarly articles on using social media for science communication, and personal experience. Examples of academia and scholarship on social media and hashtags to use will also be included. The content of this poster is intended to serve as a starting point for archaeologists and anthropologists interested in using social media as a form of public outreach.

**Aitchison, Kenneth (Landward Research)****[185]***Chair***Aitchison, Kenneth (Landward Research) and Christopher Dore (Heritage Business International)****[185]***Billions of Dollars: Calculating the Size of the Heritage Compliance Sector*

The presenters, through their companies Landward Research and Heritage Business International, produce annual reports on the size of the heritage compliance or commercial archaeology sectors in the United States, the United Kingdom, Canada, and worldwide. These reports show the enormous scale of commercial archaeology—hundreds of millions of dollars are being spent by clients in these countries, directly investing in archaeological work that they are required to undertake. This paper will review the heritage compliance sector's position within the wider environmental consulting financial ecosystem, will look at the economic history of the industry from the 1970s to the present day, and will discuss why knowing about the billions of dollars that are spent on heritage compliance around the world is important.

**Alaica, Aleksa (University of British Columbia)****[51]***Chair***[51]***Discussant***Alaica, Aleksa (University of British Columbia)****[23]***Entangled Human and Nonhuman Life Histories: A Glance into the Perceived Value of Camelid Identity from the Central Andes*

A multispecies approach to archaeology creates the potential for inclusive debate on the value of identity among both human and nonhuman beings. This paper explores the way that camelid life histories were shaped by and influenced sociopolitical relationships among the Late Moche communities (600–900 CE) on the north coast of Peru. In a multispecies framework, I examine the role of camelids as nonhuman agents that afforded some interactions between human groups yet constrained others. My intention in foregrounding camelid life histories in this discussion is to posit that years of care and co-habitation between humans and camelids fostered kinship that expanded beyond human groups and could have incorporated nonhuman beings. This perspective is inspired by Salmón's concept of kincentric ecology in which he focused on the Rarámuri concept of *iwígara* where kin (or relatives) can be recognized in natural elements of the environment and permits sustainable lifeways. I will argue that camelid life histories were fully known and valued among Late Moche communities at the site of Huaca Colorada. Local and nonlocal herds were entangled in distinct deposition events linked to elite and non-elite practice that attest to the value of nonhuman kinship to transforming sociopolitical relationships among the Moche.

Alaica, Aleksa [208] see Paskulin, Lindsey

Alam, Iqtedar [142] see Green, Adam

**Alanis, Jorge (University of Texas, Rio Grande Valley), Benjamin Ramirez (University of Texas, Rio Grande Valley), Kepler Dimas (University of Texas, Rio Grande Valley), Camila Jara (Pontifical Catholic University of Ecuador) and Guy Duke (University of Texas, Rio Grande Valley)**

**[237]**

*Drilling inside the Structure Atop the Mound: A Potential Lapidary Workshop at Buen Suceso*

The lithic materials recovered from Buen Suceso are varied in use types and materials. This paper will focus on the collections of chipped stone drills excavated from the Unit 6 Structure at the site, located on top of a possible mound. The presence of concentrations of these drills in specific areas of the structure, along with bead blanks and other decorative stone and shell artifacts, strongly indicates lapidary activities here. We will describe variations in tool size, shape, and materials as well as in the lapidary products of the tools. The focus, however, will be on the locations of these stone drill concentrations in combination with other possible activity areas in the structure and what this implies for its overall use. The current evidence is open to interpretation. It is likely that the structure was not solely, or even primarily, a lapidary workshop. It may have been a domestic structure, indicating that lapidary work may have been an element of general household production. The location of lapidary activities atop this possible mound overlooking the site could also be evidence for the importance of this craft here.

Albarrán, Rocio [11] see Reyes, Mara

Albert, Rebecca [140] see Kooiman, Susan

**Alcantara, Keitlyn (Indiana University)**

**[108]**

*Moderator*

**Alcantara Salinas, Andres (Arqueólogo)**

**[189]**

*El uso del adobe en el valle de Colima (600–900 dC)*

La propuesta de trabajo abordará el uso del adobe en el Occidente Mesoamericano durante el periodo comprendido entre los años 600–900 dC, el cual representó para los habitantes del Valle de Colima, un movimiento transformador que modificó de manera radical la ideología y costumbres que hasta el año 600 dC fueron utilizadas alrededor de mil años; lo cual se observa claramente en los contextos arqueológicos, donde para este nuevo periodo, se rompe con diversas tradiciones ancestrales, en especial con la manera de enterrar a sus muertos, dejando de utilizar la denominada tumba de tiro, dando pie a nuevas expresiones de enterramientos, algunos asociados al uso de adobe; material que aparece desde la manera más discreta en los contextos funerarios, hasta verdaderas cistas funerarias. Caso similar ocurre con los registros de edificaciones formales, ya que antes de este periodo, no hay evidencias de espacios habitacionales con materiales duraderos, lo que, si ocurre con esta transición, donde la piedra y el adobe se presentan como materiales de construcción; el adobe se ha registrado como posibles muros de plataformas habitacionales, así como para la conformación de una habitación que fueron hasta ahora excavadas por el INAH.

Alcantara Salinas, Andres [162] see Flores Ramírez, Rosa

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

[110]

*Discussant*

Aldeias, Vera [212] see Goldberg, Paul

Aldeias, Vera [159] see Soressi, Marie

**Alders, Wolfgang (University of Arkansas, Fayetteville) and Julia Jong Haines (Cornell University)**

[169]

*Landscapes of Stone in Mauritius and Zanzibar*

Using archaeological and geospatial methods, we compare landscape modifications associated with the maintenance of the monocropping plantation orders under Omani, French, and British colonialism in nineteenth-century Zanzibar and Mauritius. How do similarities and differences in the material signatures of these island sites inform an understanding of colonial historical processes in the Indian Ocean? In Zanzibar, Swahili communities displaced from plantation areas built field walls, grew root crops, and dug wells in the coralline limestone bedrock, strategies that enabled community resilience beyond the areas that Omani planters transformed for commodified clove production. In Mauritius, enslaved and indentured people from East Africa and South Asia transformed the previously uninhabited island into a sugar colony; they displaced stones into rocky lines, pyramids, and walls and dug bore holes in the basalt bedrock. This process visibly delineated owned-land from non-property land, altering the very fabric of the island in the process. In both cases, stony landscapes mediated different approaches to agricultural production, land use, and community building. By tracing the material signatures of stony landscape modification we establish a methodology for comparative studies of small-scale adaptations to social and environmental change within the context of large-scale processes of agro-capitalism, colonialism, and ecological transformation.

Alegre, Marta [240] see Bao, Yige

**Alexander, Clara (University of Alabama), Sandra Balanzario (Instituto Nacional de Antropología e Historia) and Alexandre Tokovinine (University of Alabama)**

[95]

*Recuperando el rompecabeza: Un análisis de la escalera jeroglífica de El Resbalón*

El asentamiento prehispánico de El Resbalón está ubicado en el sur de Quintana Roo y alberga la segunda escalera jeroglífica más grande conocida en el área Maya. El proyecto “Levantamiento digital de los bienes muebles e inmuebles de los sitios arqueológicos de Dzibanché, Ichkabal y El Resbalón”, en colaboración con el Instituto Nacional de Antropología e Historia y la Universidad de Alabama, (titularidad de los investigadores Sandra Balanzario y Alexandre Tokovinine), considera el uso de las nuevas tecnologías 3D para documentar los monumentos. A través de análisis morfológicos, estilísticos, y estadísticos, se proyecta recuperar la configuración original de la escalera y, al hacerlo, restaurar su narrativa. Análisis que ayudará a revelar cuántos bloques aún permanecen in situ, lo que nos permitirá evaluar el volumen de los bloques faltantes. Además, el análisis epigráfico de la escalera enriquecerá el conocimiento que se tiene de El Resbalón, así como las relaciones político económicas durante el periodo Clásico, con su vecino más cercano: el asentamiento prehispánico de Dzibanché. Finalmente, el proyecto considera realizar una réplica de los monumentos de la escalera jeroglífica.

**Alexander, Michael****[174]***New Methods for Training Historic/Prehistoric Human Remains Detection Dogs*

Human remains detection dogs have been used with success to detect both historic and prehistoric human remains in various projects in the United States and Europe. However, success has often been marginal, as it is with “search and rescue” cadaver dogs. Three dogs have been trained at the forensic anthropology center at Texas State University on both complete surface and buried remains, then a green cemetery with buried remains ranging from fresh to 12 years. Typically, historic dogs are started on old dry bone and graves in historic cemeteries. These dogs did not train on historic graves until after initial training on whole bodies in various stages of decomposition was completed. Two dogs have successfully identified both historic and prehistoric graves in multiple locations to date. The third dog is still in training and will be tested later this year. This method appears to be more statistically successful; however, no one knows what the dogs are responding to. One theory is that recalcitrant fat remains in the soil as bones are often degraded beyond recovery. Further research is needed to determine long-term efficacy of the training method and the components that allow the dogs to identify the graves.

**Alexander, Rani (New Mexico State University) and Jocelyn Valdez (New Mexico State University)****[215]***The Zooarchaeological Remains from San Miguel de Carnué (LA 12924) from the 2022 Field Season*

We present an initial analysis of zooarchaeological remains recovered from 2022 field season of the NMSU Archaeological Field School, directed by Dr. Kelly Jenks, for the ancestral frontier settlement of San Miguel de Carnué, occupied 1763–1771 by the Cañón de Carnué Land Grant Community in the East Mountains of Albuquerque, New Mexico. Our analysis is framed by understandings of the cultural and ecological changes caused by the introduction of domestic animals such as cattle, sheep, goat, pigs, and chickens as New Mexico’s communities were drawn into Spain’s transoceanic empire. We analyze taxonomic abundance, variation in anatomical part representation, and human, animal, and environmental modifications evident on the assemblage to construct taphonomic histories of animal remains recovered from different archaeological contexts. We compare our results to zooarchaeological assemblages recovered from Paa-ko, Tijeras Canyon, and similar contemporary sites.

Alexandropoulou, Anna [162] see Rothwell, Jessica

Alford, McKenzie [124] see Haug, Jaxson

**Allard, Francis (Indiana University of Pennsylvania)****[109]***Glass Beads along the Early Maritime Silk Route: A View from Southeast China*

From the fifth century BCE to the early centuries CE, glass beads played an important role as trade goods along the Maritime Silk Route, with large numbers found at coastal and inland sites in South, Southeast, and East Asia. Archaeology and compositional analysis have identified distinct glass recipes and likely manufacturing sites throughout the maritime region. In southeast China’s Lingnan region (present-day Guangxi and Guangdong provinces), earlier glass beads made in China were complemented—during the first century BCE of the Western Han period—by beads produced in India and Southeast Asia. At the coastal site of Hepu (Guangxi), a few hundred burials dating from the first century BCE to the third century CE contained over 30,000 glass beads, with large numbers also found in Han period burials in Guangzhou and Guigang county. This burial data is used to comment on the timing of arrival of glass beads, their spatial distribution in the region, their association with funerary measures of status, and possible routes of redistribution within the region itself.

**Allen, Mitchell (University of California, Berkeley)****[195]***Discussant***Allen, Mitchell (University of California, Berkeley), William Trousdale (Smithsonian Institution, Emeritus) and Ghulam Rahman Amiri (Afghanistan Institute of Archaeology [deceased])****[230]***The Thousand-Year Shrine: Ancient Roots of a Modern Holy Place in Afghanistan's Desert*

Ziyarat-i Amiran is a contemporary shrine dedicated to one of the founders of Islam in Afghanistan. Located in the barren Sistan desert of southwest Afghanistan and supported by food, water, and fuel brought in by pilgrims and truck drivers, it seems an unlikely place to support an ongoing religious institution. Documented by the Helmand Sistan Project in the 1970s, ruined buildings in the complex suggest its foundation dates to the eleventh century or earlier and may have been sponsored by the occupants of a large estate nearby. This presentation will outline what we know about the history of the shrine and its current occupants based on ethnographic, historical, and archaeological evidence found there.

Allen, Thomas [15] see Yeske, Kate

Allison, James [198] see Finley, Judson

Allshouse, Aurora [29] see Khachemoune, Nour

al-Nahar, Maysoon [168] see Olszewski, Deborah

Alonso Olvera, Alejandra [129] see Smith, J. Gregory

**Alperstein, Jonathan (Dartmouth College), Jesse Casana (Dartmouth College), Madeleine McLeester (Dartmouth College), Nathaniel Kitchel (Dartmouth College) and Carolin Ferwerda (Dartmouth College)****[177]***Where Are All the Woodland Villages of Vermont?*

There is a general absence of evidence of Woodland village sites (~900–1600 CE) in New England's archaeological record. Due to a long history of colonization and environmental factors, even Woodland house sites, let alone villages, are incredibly scarce in the region. Despite that, many large village settlements appear within the early colonial ethnohistorical record. Some scholars suggest that settlements existed only in southern coastal New England, where dispersed mobile farmers dominated the interior. Others argue that sedentary villages existed beyond the coastal region, but evidence for them has been obfuscated. In order to address this debate, we have undertaken landscape-scale geophysical surveys in several areas of the Upper Connecticut River Valley. Using ground-penetrating radar, we have located multiple new house sites, helping resolve this debate and offering an alternative model for Woodland period settlement patterns in northern New England.

Alperstein, Jonathan [55] see Casana, Jesse

Alperstein, Jonathan [69] see Graves, Michael

Alperstein, Jonathan [111] see McLeester, Madeleine

al-Soulimann, Amer [21] see Beller, Jeremy

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

[78]

*Moderator*

**Alvarez, Carlos (Centro de Estudios Mayas, UNAM)**

[85]

*Evidencias arqueológicas del “ika” tojolabal, una tradición ancestral*

La ceremonia del temascal, el baño ritual prehispánico, está presente desde épocas remotas en muchos sitios arqueológicos de Mesoamérica hasta la actualidad. Para la etnia tojolabal es de gran importancia terapéutica relacionada con la salud del grupo familiar que habita en la casa, en especial la fertilidad de las mujeres y de los campos de cultivo. Las evidencias arqueológicas provienen de uno de los pocos pueblos fechados en el periodo Posclásico Tardío y el inicio de la época colonial en los Altos Orientales de Chiapas. El asentamiento prehispánico aprovechó cinco pequeños promontorios naturales dentro de una zona de humedal a manera de islas con fines defensivos, comunicadas mediante puentes o calzadas sobre la ciénega. Se mostrará la ubicación del Ika, generalmente adosado a los muros de las terrazas que soportan los conjuntos habitacionales, su forma y materiales constructivos, con una breve analogía etnográfica. Además de otros aspectos interesantes de la vida familiar del grupo social.

Alvarez, Stephen [241] see Schaefer, Jordan

**Alves, Marcony (University of São Paulo)**

[59]

*Precolonial Ceramic Tradition and Cariban Language Family in Amazonia: Do They Match?*

The origins and the dispersal of the most widespread language families in the world is one of the enduring problems that bring together archaeology, linguistics, and genetics. In Amazonia, archaeological research has tentatively associated ceramic traditions (grouping different technological styles) and the expansion of the major language families. As in other places, historical scenarios are disputed between models based on descent from common ancestry and those based on diffusion by social interaction. One fundamental drawback of the Amazonian archaeolinguistics models is that they mostly rely on temper and decoration techniques frequencies. Ethnoarchaeological studies show that, generally, the best ceramic proxies for phylogenetic relationships are forming methods and techniques because they are more resistant to change and borrowing. Considering this assumption, the presentation will focus on the manufacture of Incised Punctuated Tradition (IPT) pottery and its hypothetical correlation to Cariban language family in the Lower Amazon. Macroscopic analysis and computed tomography are used to unveil and compare *chaîne opératoires* of three contemporary IPT styles (~1000–1600 CE) and one unrelated Pocó Tradition assemblage (~1000 BCE–500 CE). Contrasting the Andes, Amazonian potting traditions seem more homogenous throughout the region, posing an additional challenge for tracking cultural ancestry.

Alves, Marcony [59] see Pugliese, Francisco

Alves, Marcony [86] see Villagran, Ximena

Amartuvshin, Chunag [24] see Hanks, Bryan

Amartuvshin, Chunag [244] see Wright, Joshua

**Ambler, Bridget****[231]***Discussant***Ambrose, Stanley (University of Illinois, Urbana-Champaign)****[2]***Strontium Isoscape Biogeochemistry, Human Developmental Biology, and Residential Biography*

Interpretation of chemical and isotopic tracers of individual life history requires a realistic understanding of skeletal biology and physiology, particularly gender differences in mineral nutritional requirements for reproduction such as lactation, which may affect bone mineral elemental turnover and transfer of mineral from mother to offspring. Teeth formed prior to weaning may contain substantial amounts of strontium and other elements from the maternal skeleton. Pre-weaning teeth may in part reflect maternal provenience while post-weaning teeth may record the provenience of the individual analyzed. Therefore, enamel mineralization timing and maternal input must be considered in sample selection and  $^{87}\text{Sr}/^{86}\text{Sr}$  interpretation. Accurate bioavailable strontium isoscape reconstruction requires a realistic understanding of rock and soil chemistry and weathering. Although strontium-87 increases with geological age,  $^{87}\text{Sr}/^{86}\text{Sr}$  variation is primarily controlled by the abundance of rubidium-87, which is the parent isotope of  $^{87}\text{Sr}$ . Rocks with high Rb/Sr have high  $^{87}\text{Sr}/^{86}\text{Sr}$ . Ancient Precambrian rocks with low Rb/Sr can have  $^{87}\text{Sr}/^{86}\text{Sr}$  as low as recent Quaternary lavas and sediments. Site selection for isoscape reconstruction should consider Rb/Sr variation in sample site selection. Examples from varied geologies in eastern Africa will be presented to illustrate primary control of Rb/Sr on strontium isoscape variation.

**Amend, Tessa****[209]***Cultural Resource Implications of Wildfires on the Orchard Combat Training Center*

The Orchard Combat Training Center (OCTC) is a premier joint combined arms training site, located on the western Snake River Plain in southern Idaho. Military training activities often come with an added risk of wildfire, and like much of the western United States, climate change has increased the probability, extent, and intensity of wildfires in Idaho. As temperatures continue to rise and military training on the OCTC expands, cultural resource implications of wildfire will need to be addressed in the near future. This paper will describe wildfire behavior on the OCTC, identify potential direct and indirect effects of fire on cultural resources, and present appropriate methods for mitigating those effects.

Amend, Tessa [88] see Conti, Alberto

Amicone, Silvia [59] see Martínez-Carrasco, Andrea

Amiri, Ghulam Rahman [230] see Allen, Mitchell

Ammesmaki, Marcus [98] see Arnott, Sigrid

Anastasio, Alison [111] see McLeester, Madeleine

Anaya Hernández, Armando [17] see Dunning, Nicholas

Anaya Hernández, Armando [17] see Lentz, David

Anaya Hernández, Armando [189] see Lockett-Harris, Joshua

Anaya Hernández, Armando [147] see Longstaffe, Matthew  
 Anaya Hernández, Armando [152] see Parrott, Nathan  
 Anaya Hernández, Armando [204] see Reese-Taylor, Kathryn  
 Anaya Hernández, Armando [93] see Vázquez López, Verónica

Anderies, John [198] see Freeman, Jacob

**Anderson, C. Broughton (Berea College)**

[138]

*Home: Place, Space, Survival, Resistance*

In the mid-nineteenth century, Spicy Baxter and siblings were emancipated by their father, George White, a freedman in Madison County, Kentucky. The family moved south, away from their northern Madison County farm to a rugged, isolated, parcel in the south of the county. Here, Spicy and her female siblings lived until the early twentieth century. But why did White move his family—namely, his female children—to this location? Using “home” as a foundation, this paper explores the lifeways of Spicy Baxter and her extended female family during the late nineteenth and early twentieth century in Madison County, Kentucky. Local archives and archaeological excavation along with ideas of home place (hooks 2008) and home space (Battle-Baptiste 2011) aid in the exploration of the “afterlife of slavery” (Hartman 1997). Critical to understanding the lives of the Baxter women is the application of theories of racial capitalism, clearance, and erasure as means of seeing a materiality of oppression and violence through what Hartman describes as “familiarizing the unfamiliar” (Hartman 1997).

**Anderson, David G. (University of Tennessee)**

[1]

*Discussant*

Anderson, David G. [124] see Wells, Joshua

**Anderson, David S. (Radford University)**

[40]

*Discussant*

**Anderson, David S. (Radford University)**

[105]

*“You discover 1d4 ancient relic(s)”: Archaeological Outreach through Tabletop Roleplaying Games*

From the very origins of tabletop roleplaying games, creators like Gary Gygax turned to scholarship of the ancient world as a wellspring for fantasy worldbuilding, in-game quests, and tradition-rich non-player characters or legendary creatures. Through this lens, gamers took an active role in exploring and learning about a perceived ancient past, a past which, as noted by Peter Hiscock (2012) in his study of the depiction of archaeology in movies, is frequently imbued with supernatural power. Unlike movies, however, tabletop roleplaying gives players an opportunity checked only by their imagination to yield that power for themselves. It is well past time for archaeologists to take up that power to engage the public in an understanding of archaeological practice and past human cultures! This poster will discuss preliminary results from in-class exercises built around tabletop roll-playing mechanics to engage students in an archaeological world empowered by their own choices, yet grounded in anthropological data rather than fictional lore. As “tabletop” gaming spaces increasingly move to the digital platforms, these methods open the possibility for far reaching educational outreach in archaeology, while maintaining engagement that reaches to the individual level.

Anderson, Derek [89] see Miller, D. Shane

**Anderson, Jenna (Stony Brook University) and Sonia Harmand (Stony Brook University)**  
**[21]**

*Early Middle Pleistocene Flake Production Methods at Nadung'a Site Complex, West Turkana, Kenya*

The Middle Pleistocene (0.77–0.13 Ma) was a crucial time in the evolution of the human brain. *Homo heidelbergensis* cranial fossils and endocasts provide evidence of brain size increases and structural changes during this time, which resulted in brains more like our own. The analysis of Acheulean lithic assemblages provides a means of exploring how these morphological changes affected hominin cognitive abilities. Flake production methods were an important technological component of many Acheulean assemblages, alongside or sometimes to the exclusion of the production of handaxes. Recent studies have established that complex, cognitively demanding Levallois methods, once associated with the Middle Stone Age/Middle Paleolithic, first emerged in the Acheulean. However, studies of Levallois or Levallois-like methods at Acheulean sites are limited to the later Acheulean (0.5–0.13 Ma) or the Victoria West Industry in South Africa. Here we characterize flake production methods at the early Middle Pleistocene (~0.7 Ma) sites of Nadung'a in terms of their productivity, operative complexity, and hierarchy, as well as the level of skill exhibited by the knappers. The Nadung'a sites are compared to the nearby Early Pleistocene site of Nachukui 6 to determine how reduction methods changed through time.

Anderson, Lyle [132] see Desrosiers, Pierre

Anderson, Ryan [71] see Jazwa, Christopher

**Anderson, Shelby (Portland State University)**  
**[62]**

*Chair*

**Anderson, Shelby (Portland State University)**  
**[107]**

*Discussant*

Anderson, Shelby [27] see Butler, Caelie

Anderson, Shelby [62] see Cody, Tia

Anderson, Shelby [123] see Diciuccio, Laurel

André, Lino [239] see Cascalheira, João

**Andrews, Bradford (Pacific Lutheran University)**  
**[125]**

*Getting to the Point: Evidence for the Bow at Epiclassic Xochicalco, Mexico*

Conventional wisdom suggests that the bow was not present in Mesoamerica until the Postclassic period (AD 900–1519). This date is chronologically convenient because it is consistent with the notion that the bow diffused from North America after AD 700. New evidence from the Epiclassic (AD 650–900) central Mexican city of Xochicalco suggests otherwise. This poster addresses the presence of micro-blade arrow points recovered in the city's civic-ceremonial center. I argue that the prevalence of these points indicates that the bow was used in combat at Xochicalco. This inference is supported by the ubiquity of these points, their morphological characteristics, and the archaeological contexts where they were recovered. Experimental

research indicates these points would have been too small for atlatl darts; moreover, they represent more than 50% of the weaponry from the civic-ceremonial center. Finally, based on ethnohistoric data, most points were recovered in two structures in the main public plaza that appear analogous to the Aztec-period Tlacoachcalco, or armory. These small arrow points are consistent with an Epiclassic emphasis on militarism and what technological research reveals about the restrictions placed on the availability of obsidian at Xochicalco during this period.

**Andrews, Charles (CU Boulder)**

[46]

Chair

**Andrews, Charles (CU Boulder)**

[46]

*Theorizing the Intersection of Space and Power: Lessons from the Landscape Archaeology of the US Southwest*  
 Along with many other disciplines, Space and Power are both topics of long-standing interest within archaeology. Space has been heavily theorized by authors such as LeFebvre, de Certeau, Soja, and Adam Smith. While there has not been an equivalent to the “Spatial Turn,” Power has also received much attention, and authors such as Marx, Althusser, Bourdieu, and Foucault have been deployed by archaeologists. However, while Space and Power have occasionally been considered together (e.g., Foucault), the linkage has not been formally theorized. In addition, one of the most sustained and developed theorizations of Power, Michael Mann’s “four sources” model of social power (Military, Economic, Ideological, and Political) has not been drawn upon by archaeologists, even though he applies it to ancient societies himself in his first volume. This paper seeks to contribute to filling the first gap by proposing the idea of “spatializing” Mann’s model. The Landscape Archaeology of Hohokam canals and Chacoan roads will be utilized as examples to show how this idea can be operationalized, and to illustrate its potential for archaeological application and the development of theory linking Space and Power.

Andrews, Michelle [240] see Porter, Samantha

**Andrieu, Chloé (CNRS Université Paris I Panthéon-Sorbonne) and Charlotte Arnaud (CNRS Université Paris I Panthéon-Sorbonne)**

[58]

*Looking at the Blind Spot of the Maya Collapse: Highlands Occupation during the Ninth and Tenth Centuries*  
 Various studies have suggested that, as a consequence of the radical crises that the Maya cities underwent at the end of the Classic period, a portion of Central Lowlands population could have migrated toward the Yucatán peninsula. However, very few works have dealt with the Highlands, despite it having been one of the most densely populated regions when the Spanish arrived. This presentation proposes a synthesis of the available data for the ninth and tenth centuries in that still insufficiently studied part of the Mayan area. It focuses on the indices of Lowlands influence and presents the most recent excavation data from Alta Verapaz.

Angeles, Yosselin [13] see Cifuentes, Gerardo

**Angeloff, Nick, Meagan McKinney (Cal Poly Humboldt), Hannah Vizcarra (Cal Poly Humboldt) and Marisol Cortes-Rincon (Cal Poly Humboldt)**

[227]

*Crnobuki: A Garrisoned Acropolis*

Cal Poly Humboldt has established a relationship with the Museum of Bitola to conduct research in the

Pelagonia region of Macedonia. The museum and Cal Poly Humboldt conducted an initial reconnaissance of several locations and established a research location in Crnobuki. The acropolis adjacent to the town is the location of an ancient Macedonian garrison associated with Heraclea Lyncestes. Limited excavations established occupation between the fourth and second centuries BCE, with the Romans overtaking and burning the outpost circa 160 BCE. Our research suggests the location may be associated with Phillip of Macedon's conquest of Lyncestes, Alexander's establishment of the original City of Heraclea Lyncestes, and the Roman conquest of Macedonia during the "Macedonian Wars." Research conducted by Cal Poly Humboldt indicates potential to answer questions associated with sociocultural change and warfare with multiple episodes of warfare stretching from the reign of Phillip II and Alexander III during the height of the Macedonian empire through the reign of Perseus and an ultimate shift in both political and social change following the Roman conquest. This acropolis and surrounding village will provide insight into the development of the Macedonian empire from the soldiers' perspective.

Angeloff, Nick [64] see Busch, Daniel  
 Angeloff, Nick [117] see Castro, Mark

Angers, Michael [181] see Moriarty, Ellen

**Ann, Brysbaert (Leiden University, The Netherlands)**  
 [189]

*A Moving Taskscape in the Late Bronze Age Argolid, Greece*

In past pre-industrial societies featuring large-scale building projects, extensive manual labor was invested during the entire *chaîne opératoire* of construction. This report focuses instead on the cost of multiple labor activities during the thirteenth century BCE in the Aegean Late Bronze Age. It aims to move "beyond the calculation of average and peak overall man-power requirements to consider the workforce as individuals, thereby allowing a closer estimation of the size and nature of the man-power" (DeLaine 1997). Prehistoric people in the Argolid were interconnected through multiple daily tasks while remaining resilient before the accumulated crises around 1200–1190 BCE. I investigate labor costs required for monumental and domestic house building, infrastructure provision, tomb digging, pottery production, and several agricultural activities. Their joint implications to society are compared and discussed in light of a cross-crafting taskscape which mobilized large groups of people on a daily basis, locally and in the region. This research highlights that rural landscapes and their populace formed the backbone of Late Mycenaean agricultural and crafting societies. Understanding energy expenditure from a bottom-up perspective suggests large levels of responsibility in the hands of farmers and workers rather than allowing elites to rule the scene, as is often suggested.

**Antonelli, Caroline (University at Albany—SUNY) and Timothy Hare (Morehead State University)**

[165]

*You Can Bet on the (Rural) Farmer: Agriculture and Urbanism at Postclassic Mayapán*

In Mesoamerica, recent scholarship emphasizes the importance of urban smallholders, or intensive production by urban residents. The acquisition of regional lidar imagery of urban centers and surrounding landscapes reveals that the spatial limitations of production were often far more extensive than once thought. We use the spatial analysis of remotely sensed data to evaluate maize production potentials across the area of Postclassic settlement in and surrounding Mayapán in the northern Yucatán Peninsula. Mayapán is the largest Postclassic urban center in the Maya Lowlands and was profoundly interconnected politically, economically, and culturally with populations across the peninsula. Traditional and lidar surveys in the Mayapán region during the last 20 years reveal a densely occupied cityscape and rural settlement characterized by widely distributed ceremonial groups linking a network of diverse settlements across the region. We contextualize the results with estimated site population and the resulting caloric requirements of its residents. We argue that the states in the region were substantially dependent on production by rural

farmers. Rural maize production would have been a major contributor to the urban polity's overall sustainability and longevity.

Antorcha-Pedemonte, Ricardo [8] see Fargher, Lane

**Arakawa, Fumi (New Mexico State University), Sara Harper (New Mexico State University), Robin Chistofani (New Mexico State University), Carly Johnston (New Mexico State University) and Nathan Craig (New Mexico State University)**

[143]

*Inclusiveness and Multivocality: A Case Study from the New Mexico State University (NMSU) Organ Mountains Exhibition*

Academic archaeological research is a multi-step process that generally involves research design development, fieldwork, analyzing artifacts and data, writing, publishing results, and disseminating findings (sometimes to the public). In this paper, we argue that archaeologists need to do more at the last stage of archaeological research—dissemination. Specifically, museum exhibitions are a powerful and meaningful way to inspire and educate the public about inclusiveness and multivocality in archaeology. The “Humanhood in the Organ Mountains: Prehistory” exhibit at New Mexico State University Museum serves as an exemplar case study of inclusiveness and multivocality through a collaborative effort with six Zuni elders. The exhibit demonstrates how archaeologists can integrate Native narratives into exhibit schemes, thus expositing the non-Native public to new perspectives on prehistory in North America.

Arakelyan, Dimitri [56] see Haydosyan, Hayk

Araujo, Astolfo [21] see Araujo, Renata

Araujo, Astolfo [148] see Batalla, Arlys Nicolás

Araujo, Astolfo [21] see Correa, Letícia

**Araujo, Renata (Museum of Archaeology and Ethnology, University of Sao Paulo), Mercedes Okumura (Laboratory for Human Evolutionary Studies) and Astolfo Araujo (University of Sao Paulo)**

[21]

*Geometric Morphometrics on the Spot: When Artifact Shape Tells Us More of Prehistoric Lithic Variability in São Paulo State, Brazil*

This presentation contemplates the application of a method of analysis for the study of artifact shape named geometric morphometrics (GM). GM is a quantitative method originated in the biological sciences with a large application in evolutionary biology for the analysis of organismal form. Evolutionary archaeologists have been employing this approach to material culture studies mainly for the last 10 years and the use of GM has seen much increase particularly in lithic studies, allowing archaeologists to address questions regarding cultural phylogenies, classification, human dispersal, ecology, etc. In this occasion we attempt to present preliminary results of the doctoral project under development by the first author, featuring GM analysis of lithic bifacial points and unifacial tools of hunter-gatherer groups from southeastern Brazil. This research is embedded in a cultural evolutionary framework and its main goal is to characterize the morphological variability of the two classes of formal lithic artifacts abovementioned within São Paulo State (southeastern Brazil). Results attest that GM is an effective tool to show diversity of shape and size of bifacial points and unifacial tools in distinct areas of São Paulo, despite a great overlap of shape observed among the sets of artifacts analyzed so far.

**Arbuckle, Benjamin (University of North Carolina, Chapel Hill)****[128]***Animals Do Speak but Are We Listening? Perspectivism, Slow Zooarchaeology, and Contemplating Animal Domestication*

In this paper I argue that animals do in fact speak to us and discuss several ways in which this framework can be approached. Through consideration of perspectivism as well as methodological approaches designed to disrupt zooarchaeological work as usual, I attempt to take animals seriously by listening to what they have to say. I apply this attempt to access alterity to zooarchaeological narratives of domestication and contemplate the impact of looking at animal domestication from points of view that do not center human agency and economic and ecological necessity.

Archuleta, Greg [62] see Edwards, Briece

Archuleta, Greg [72] see Pouley, Cheryl

**Ardren, Traci (University of Miami)****[52]***Discussant***Ardren, Traci (University of Miami)****[23]***Wild Fruits and Connective Linkages in Precolumbian South Florida*

Academic reconstructions of south Florida Indigenous lifeways prior to European contact have focused primarily on the deliberate choice of these highly complex societies to rely exclusively on wild foods, even while corn agriculture was practiced in nearby parts of the peninsula. Indeed, the Calusa are justly famous in the archaeological literature for sustaining a high degree of social complexity on a purely wild food diet of largely marine resources. What has not been adequately considered is an interdependence on wild fruits that also played a significant role in Indigenous south Florida diets prior to contact. This paper will explore how fruiting trees such as hog plum and prickly pear drew Indigenous people away from coastal environments and into scrubby pinelands. These nutritious fruits provided essential vitamins and fats but asked for little in return. Nonhuman subjects were a key component of south Florida Indigenous ontologies, and this paper will explore the connective linkages between wild fruits and marine-orientated peoples.

Ardren, Traci [100] see Clark, Jessica

Ardren, Traci [191] see Valerio-Romero, Karolina

**Areche Espinola, Rodrigo (University of Pittsburgh)****[12]***The Storage Systems in the South Coast Region: The Case of the Cañete Valley*

Undoubtedly, storage systems played a key role in Inca political and economic organization in the Andes. The Inca state employed these goods stored for different purposes, such as supporting military campaigns, financing state works, and hosting ceremonial activities. However, most research on Inca storage has focused on the storage facilities located in the highlands of Peru and linked directly to an imperial scale. In contrast, some researchers have admitted the difficulty of associating the deposits of coastal groups with the Inca imperial agenda. In this presentation, we will discuss existing models on the role of storage systems in the Inca economy and present the case of the Cañete valley, located on the south coast of Peru, one of the regions with the largest number of deposits on the coast. The storage infrastructure on different scales in the Cañete valley will be critical to developing a future research agenda regarding the changes and continuities of the Inca economy on the coast.

Arellano, Monica [163] see Buonasera, Tammy

Arellano, Monica [175] see Hill, Brittany

**Argoti Gómez, Juan**

[99]

*The Sonorous Univers of the Jama-Coaque Culture: A Historical-Ecological Approach to Past Soundscapes*

Musical creation, starting with the intonation of defined sounds through the construction of sonorous artifacts, can be understood as the way in which humans give a voice to the abstract of their soul. Consequently, human soundscapes, constitute an integrated and holistic reflection culture. Therefore, following the concept of religious routinization (Oyuela-Caycedo 2002) and the demarcated and routinized iconographic depiction of priestly elites in the Jama-Coaque culture (350 BC–AD 1532), in which “musicians” are distinguished by ornithomorphous headdresses (Gutierrez Usillos 2013, 2014; Quelal Madrid 2014); I theorize, under the conceptual framework of historical ecology, that sound modeling, being a constant part of their routinized ceremonies, would entail an equivalent level of standardization. Thus, the compilation of the sounds produced by nonperishable “musical” artifacts (i.e., ocarinas, whistles, and whistling bottles), combined with the corpus of sounds produced by the “singing” birds in the region, would entail the compilation of the fragmented elements of the Jama-Coaque’s soundscape. Hence, this process would enable the reconstruction of the Kamu Purri–type pan flute of Jama-Coaque, and in consequence, of its musical universe.

**Arias Espinoza, Oscar (Universidad Nacional Mayor de San Marcos)**

[9]

*Renovar para construir: La renovación del templo en Chavín de Huántar durante el Periodo Formativo (1100–450 aC)*

En esta exposición se discuten las características y el significado de la práctica ritual de renovación del templo encontrada en Chavín de Huántar (Perú) durante nuestras investigaciones. Proponemos que esta formó parte de un conjunto de estrategias de reproducción social que sirvieron para legitimar el poder y la autoridad de la élite que ocupó este centro ceremonial. Nuestro trabajo involucró el estudio de la secuencia estratigráfica, la arquitectura y el análisis de diversos materiales hallados en nuestras excavaciones de la Explanada Norte del Edificio “C”. Los resultados determinaron la existencia de un complejo constructivo formativo dividido en cuatro fases, desde el 1100 aC hasta el 450 aC. El complejo se caracteriza por la presencia de arquitectura ceremonial que fue superponiéndose o adosándose, encontrando su mayor dinámica edificatoria después del 850 aC. Además, definimos que el proceso constructivo siguió un ordenamiento, asociado a la limpieza de los espacios antes de construir la nueva arquitectura y la deposición de ofrendas. Concluimos que el objetivo de esta actividad ritual de renovación del templo fue reproducir la estructura social, instrumentalizando la memoria social a partir de la repetición de actividades y construcciones ceremoniales durante más de quinientos años.

**Arkush, Elizabeth (University of Pittsburgh, Center for Comparative Archaeology)**

[22]

*Chair*

**Arkush, Elizabeth (University of Pittsburgh, Center for Comparative Archaeology)**

[213]

*Conflict and the Politics of Solidarity: Hierarchy and its Limits in the Late Precolumbian Andean Highlands*

Premodern groups under significant external threat often developed a politics of solidarity, emphasizing group strength and shared responsibilities rather than vertical distinctions. This paper draws on evidence from the late precolumbian Andean highlands to illustrate how the demands of defense shaped political dynamics and leadership roles. The most defensive settlement patterns in the Andean sequence and the highest rates of adult cranial injury occur ca. 1200–1450 CE in the central and southern highlands, showing that conflict endangered populations and settlements. Leaders likely played important roles in negotiating consensus and coordinating military action (including the building of fortifications and alliances), and may have

held key ceremonial responsibilities. Status differences developed between family groups, linked to ancestral claims and protection from attack. Nevertheless, the development of sociopolitical hierarchy was limited in important ways. This Andean case serves as a counterexample to other trajectories of violent conflict and increasing political hierarchy. I suggest that causal mechanisms in some well-known theoretical models (Carneiro 1970; Turchin 2009, etc.) are less applicable than a different set of interlinked factors, not unique to the Andes: resource risk, the limited value of productive labor, constraints on wealth accumulation and display, defensive needs, and a strongly fortified landscape.

Arkush, Elizabeth [22] see Klarich, Elizabeth

Armstrong, Chelsey [20] see Lyons, Natasha

Arnaud, Charlotte [58] see Andrieu, Chloé

### **Arnn, John**

**[19]**

*Tom Dillehay, Texas, and Identity*

Tom Dillehay is best known for his tremendous contributions to the archaeology of the Americas and rightly so. In terms of quality, impact, and scope, the combined body of his work is phenomenal. His interdisciplinary holistic anthropological approach frequently casts the archaeology of the Western Hemisphere onto the world stage and serves as a catalyst for change in archaeological method and theory at both an institutional and regional scales. However, Tom began his extraordinary career on a far smaller stage in Texas more than 50 years ago. Nonetheless, his seminal early work there signaled the breadth and depth of his future success and laid the groundwork for significant changes in the way Texas archaeologists conceptualize the archaeological record today. This presentation will focus on the impact and implications of his work from the perspective of a former PhD student, archaeologist, and fellow Texan.

### **Arnott, Sigrid (Archaeo-Physics), Janis Fairbanks (Fond du Lac Tribal and Community College), David Maki (Archaeo-Physics) and Marcus Ammesmaki (Waazh Language Immersion Program, Fond du Lac Band)**

**[98]**

*The Grand Portage of the St. Louis River: Reinterpretations and Language Revitalization*

The Grand Portage of the St. Louis River is both a historic route and a series of historic sites originally documented as a fur trade connection between Lake Superior and the Mississippi River Basin. Although often considered a “contact period” site, the trail has connected diverse landscapes and peoples for thousands of years into the present era of interactions between settlers and the local Anishinaabe, including our authors. Our project brings forward Anishinaabeg women’s voices of past and present and their connections to the history of paddling and traveling, connecting that history to the results of compliance archaeology. The story of the “Women’s Portage” highlights Indigenous women’s contributions in the creation of cultural landscapes into the present day, including transportation networks. Translating some of this history into Ojibwemowin, the living language spoken by descendants of the Anishinaabe, supports expanding local language revitalization efforts. Understanding the meanings behind descriptive Ojibwemowin also deepens understanding of the portaging cultural landscape.

### **Arnzen, Jacob**

**[41]**

*From Flovis to Closom: An Evaluation of Fluted Point Morphologies*

Multiple fluted projectile points recovered from La Prele, a Clovis-age site in Wyoming, share attributes of

both Folsom and Clovis projectile point types. This raises a question of how much morphological overlap exists between these widely recognized fluted point types? In this project I explore the degree of morphological overlap between Folsom and Clovis points from samples of non-disputed point types. Using ArcGIS and digitized photographic and illustration images from published sources of Folsom and Clovis sites from the Great Plains and Rocky Mountains, I examine the degree of similarity in basic morphometric attributes including size, attributes of flaking, channel flake scar morphology, etc. This project will potentially allow the classification of the fluted points from La Prele as either Folsom, Clovis, or both, and whether the typological distinction between these point types made on the basis of morphology is justifiable.

**Arp, Ryan (EPG, a Terracon Company) and Steve Swanson (EPG, a Terracon Company)**  
[206]

*Crafting in Oversized Ancestral O'odham Structures*

Large pit structures are present at several ancestral O'odham villages in the Salt and Gila River Valleys. Although morphologically similar, they are up to five or more times larger than contemporaneous Hohokam Preclassic domestic structures. Targeted excavation of several such structures and surrounding features suggests patterns in their locations within villages, their architectural plan, associated intramural and extramural activities, and closure processes. These appear to have functioned as loci of production for ritually important craft items likely traded with other communities during the Santa Cruz and Sacaton phases. Crafters associated with these structures organized production of a limited range of specialized goods that varied within and among villages. We propose that these structures and nearby features functioned as corporate-organized crafting guilds during the Preclassic period.

Arp, Ryan [72] see Peltzer, Summer

**Arredondo, Ernesto and Arthur Demarest (Vanderbilt University)**  
[66]

*Semetabaj and Its Role in Commercial and Ideological Interaction in the Guatemalan Highlands and Beyond*

The Semetabaj site in the Guatemalan Highlands is one of the earliest sites in the region and the largest. Research carried out by E. Shook in 1978 revealed an interesting pattern of interaction with the northern Highlands and the south coast of Guatemala. The new research offers a review of the data and new proposals, which include its role as an economic center of exchange between these two areas and the most extensive trade network toward the Maya Lowlands. At the moment, the archaeology of the Highlands has not considered the trade between these two regions, especially that of obsidian. Our research considers the presence of economic networks in this sense. A series of new monuments recently discovered in the vicinity also expose involvement in an ideological sphere in the region since early times. Semetabaj was a relevant site that initially participated in a sphere dominated by Kaminaljuyu, but later opposed it, to participate in a tradition with interactions with Central Mexico, to later become one of the places where the great separation between the K'iche', Kaqchike, and Tzutujil populations can be confirmed.

**Arriaza, Bernardo (Universidad de Tarapacá), Juan Pablo Ogalde (Universidad de Tarapacá), Leonardo Figueroa (Universidad de Tarapacá), Vivien Standen (Universidad de Tarapacá) and Sian Halcrow (University of Otago)**  
[102]

*Ancient Manganism in the Andes: A Bioarchaeological View*

The ancient Chinchorro people of northern Chile used manganese as part of their mortuary rites (7000–3000 BP). Chinchorro artifacts ( $n = 12$ ) reveals the presence of manganese up to 64% measured with portable X-ray fluorescence. In addition, bone chemistry analysis from Chinchorro mummies ( $n = 68$ ) using atomic absorption spectrometry reveals for the first time the endogenous presence of manganese in their bodies. Approximately 84% (57/68) of individuals show manganese bone values beyond normal 1 ppm levels concentration, and of these, 20.6% (14/68) were overexposed to higher toxic levels (>10 ppm) of manganese.

Overexposure to manganese causes a Parkinson-like syndrome producing psychomotor problems, including emotional lability, irritability, aggressiveness, involuntary movements and facial spasms, pathological laughter, and fix facial expression. Many of these symptoms are not visible in the mummies, but the high levels of endogenous manganese found, entice us to rethink the risk of ancient mineral mining and manganese over exposure in the Andes and elsewhere. The presented data will be useful to inform manganese exploitation as an important occupational hazard in antiquity during intense mineral gathering activities for ritualistic purposes.

Arrington, Nathan [25] see White, Chantel

**Arroyo, Barbara (Museo Popol Vuh, Universidad Francisco Marroquín, Guatemala)**  
**[186]**

*Discussant*

**Arthur, John (University of South Florida, St. Petersburg)**  
**[222]**

*Beer, Pots, and Caste: A Tale of Two Sites in the Gamo Highlands of Southwestern Ethiopia*

Beer is an essential culinary food for many African societies today and in the past for daily meals, economic compensation, and ritual feasting. This paper focuses on the ethnoarchaeology and archaeology in the Gamo region of southwest Ethiopia located on the western escarpment of the Great Rift Valley. Today, a unique cultural feature of the Gamo is their strict caste system, which forces artisans such as potters, leather workers, ironsmiths, and ground stone producers into a full-time specialization. Ethnoarchaeological analysis of Gamo pottery is compared to the Garu (eighteenth and nineteenth century CE) and Ochollo Mulato (1270–1950 CE) pottery assemblages to interpret functional and social changes in the Gamo region. The archaeological analysis of the two historic sites suggests that the inhabitants were engaged in distinct occupations, with households occupying different levels of the Gamo social hierarchy based on the pottery attributes in association with beer.

Ash, Harland [201] see Yost, Scott

**Astudillo, Fernando (Universidad San Francisco de Quito) and Paúl Rosero (Universidad San Francisco de Quito)**  
**[57]**

*Digital Archaeology and Virtual Reality Models of the Penal Colonies in the Galápagos Islands (1860–1959)*

Islands have been used by societies around the world to abandon, exile, or relocate those deemed unworthy. Repressive institutions, as a form of state infrastructure, have been created on the islands during the nineteenth and twentieth centuries to detain political prisoners, immigrants, criminals, or the mentally ill. The ambiguous sovereign status and geographical remoteness of the islands were used as the perfect location to create violent repressive institutions. In South America, penal colonies existed on the Juan Fernández, Fernando de Noronha, Gorgona, Coiba, and Galápagos. Today, these prisons have been abandoned and the islands are mainly visited by scientists, biologists, and tourists. Our project is focusing on designing digital models of penal colonies that existed in the Galápagos. We use lidar, remote sensing, photogrammetry, and 3D/virtual reality to re-create abandoned buildings. The objectives are to understand the spatial organization of penal colonies, to explore the ecological impacts and its legacy on politics and identities, and to disseminate archaeological results through digital media for education and tourism. Culture and identities in the South American islands are taking shape in a scenario where memories of a violent past collide with ecological conservation and luxury ecotourism agendas.

**Atalay, Sonya (UMass Amherst)****[188]***Discussant*

Athens, Steve [54] see Pratt, Will

**Atherton, Heather (Environmental Science Associates)****[215]***Keeping It Local: Looking Inward at the Land Grant Community of San José de las Huertas*

Founded in 1765 in the foothills northeast of Albuquerque, San José de las Huertas was the byproduct of Spanish imperial policy and the aims of largely landless families and a category of people known as *genízaros* to make better lives for themselves. The crafting of this community, and its accompanying identity, amid a mix of ethnic, class, gender, and kinship relations was an important part of negotiating daily life in a landscape considered to be both part of the Spanish borderlands and within the sphere of the Rio Grande Pueblos. Using data collected from archaeological, archival, and oral historical sources, this paper considers the underpinnings of Las Huertan identity by focusing on the local and exploring the internal structure of the community.

Athie Teruel, Bruno [131] see Hutson, Scott

Atlas, Zachary [216] see Tykot, Robert

Atudorei, Viorel [252] see Neff, Nadia

Auerbach, Claire [142] see Steere, Benjamin

August, Ethan [125] see Collins, Ryan

**Augustine, Jonah (University of Wisconsin) and Brandi MacDonald (Archaeometry Lab at MURR)****[8]***XRF and Raman Spectroscopic Analysis of Pigments Used in Middle Horizon Polychrome Ceramics from Cochabamba, Bolivia*

This paper presents the results of a combined XRF and Raman spectroscopic analysis of pigments used in the production of Middle Horizon ceramics from Arani, Cochabamba, Bolivia, that are currently housed at the Denver Museum of Nature and Science. The two central questions that this analysis investigates are (1) which of these materials were produced in the precolumbian past and which are contemporary “forgeries?” and (2) did precolumbian potters produce Tiwanaku-, Omereque-, and Mojocoya-style vessels using distinct pigment recipes? These questions are then related to broader questions regarding how styles are adopted and transformed in time and space. When and why do ceramic styles persist, disappear, and reappear in the Andes? What are the broader social and political stakes of ceramic production in the past and present? How do broadly appealing styles emerge and what role does aesthetic pleasure play in the production of both ceramics and political subjectivities?

**Auld-Thomas, Luke and Marcello Canuto (Tulane University)****[165]***The MAUP and the Milpa: Analytical Scale and the Problem of Lowland Maya Sustainability*

Researchers assess sustainability using spatial bounds, be they for a single community or the entire planet. But the specific boundaries we use matter greatly, because practices (and populations) that are unsustainable at one scale may be sustainable at another depending on a host of environmental, social, and technological variables. Assessments of sustainability, in any time and any place, are thus extremely vulnerable to the Modifiable Areal Unit Problem, or MAUP. What scale is appropriate to estimate a population's sustainability, in the ancient Maya Lowlands or elsewhere? How can we determine this parameter? This is a problem archaeology needs to grapple with as it seeks to contribute meaningfully to sustainability science while armed with settlement datasets that are often small, irregular, and archipelagic. In this paper, we propose strategies for mitigating the MAUP's effect on sustainability reconstruction at local scales, and argue for the value of large-scale data aggregation to estimate the sustainability of regional settlement systems.

Auld-Thomas, Luke [23] see Dedrick, Maia

Austin, Tucker [74] see Wisner, Gavin

Avagyan, Ani [149] see Curtis, Caitlin

**Avendano, Felicia and Mika Woods****[41]***A Comparison of Changing Reduction Sequences of Obsidian from the Grandad Site in the Central Sierra, California*

This is an investigation of obsidian chipping waste from the Grandad site, located in the Central Sierra near Mariposa, California based on point types found in deposits that have shown evidence of continuous occupation from 9000 BP to European contact. We searched for evidence of a changing reduction sequence from biface blank characteristics of large dart points to a flake-based reduction sequence characteristic of arrow points. We also examined the changing amounts of cortex on the obsidian flakes with depths that may reflect changes in how the obsidian arrived at the site.

**Aveni, Anthony (Colgate University)****[80]***Did the Maya Care about the Precession of the Equinox?*

Updating progress on a collaborative project with the honoree, John Justeson, regarding the study of the use of Maya long numbers in the inscriptions.

**Ávila, Claudia (Escuela Nacional de Antropología e Historia), Yalilich Miranda (Escuela Nacional de Antropología e Historia), Emilio Aguayo (Escuela Nacional de Antropología e Historia) and Gastelum-Strozzi (Universidad Nacional Autónoma de México)****[200]***Traces of Integration: A Study of Early Colonial Ware by Imagenology Methods*

The capital of the Tarascan empire was located in Tzintzuntzan (Michoacán, Mexico), which reached its peak during the Late Postclassic (AD 1350–1525). At the time of contact, there was an almost unique continuous transition, showing a historical process of long duration, where different traditions converged. Among the evidence of this is the Romita Sgraffito ware, which is characterized by its whitish slip and lead glaze, in addition to its engraved designs in green and yellow, which show prehispanic manufacture and decoration, integrating Hispanic materials and techniques. This is a preliminary study of the sample obtained from a workshop located at the foot of La Gran Plataforma, which allows us to better identify and characterize the

manufacturing traces, through imaging analysis, such as RTI (Reflectance Transformation Imaging) and the production of multispectral images, in order to show the scope of these techniques applied in this case study.

Avila, Florencia [59] see Echenique, Ester

**Awe, Jaime, Claire Ebert (University of Pittsburgh) and Julie Hoggarth (Baylor University)**  
[11]

*Yucatec and Gulf Coast Influences in Terminal Classic Western Belize: Examining the Evidence and Processes for Change*

Archaeological investigations in western Belize have recorded a growing body of evidence that is indicative of non-central lowland Maya influences in this Maya subregion during the Terminal Classic period. Evidence for Yucatec and non-Maya influence in the Belize River Valley is manifested by the presence of new architectural styles and programs, and by the introduction of “foreign” artifacts and ideology. This changing pattern represents a departure from the previous Late Classic cultural tradition which reflects closer ties with central Petén sites. Besides providing evidence for Yucatecan style architecture and artifacts in western Belize, we suggest that these nonlocal traits were likely associated with the waning influence of Petén sites during a period of economic and political decline in the central Maya lowlands, and with the concurrent rise of Terminal Classic polities in the northern lowlands of the Yucatan Peninsula and in the Gulf Coast of Mexico.

Awe, Jaime [129] see Ebert, Claire  
Awe, Jaime [228] see Hoggarth, Julie  
Awe, Jaime [74] see Messinger, Emma  
Awe, Jaime [76] see Meyer, Brett  
Awe, Jaime [134] see Mink, Kirsten  
Awe, Jaime [72] see Pascali, Pamela  
Awe, Jaime [74] see Ramirez, Estevan  
Awe, Jaime [28] see Saldaña, Gabriela  
Awe, Jaime [165] see Walden, John  
Awe, Jaime [28] see Watkins, Tia

**Ayala, Patricia (Universidad de Chile)**  
[119]

*Discussant*

**Ayers-Rigsby, Sara (Florida Public Archaeology Network)**  
[157]

*Moderator*

**Ayling, Melissa (Simon Fraser University)**  
[222]

*Drinking the Diaspora: An Archaeological Investigation into the Maintenance of Traditional Tigrayan Brewing Practices by Emigrant Ethiopians in British Columbia, Canada*

Beer: that malty, effervescent drink has been brewing alongside humanity since before written records. Humans today are just as interested in making and consuming beer as they have been in the ancient past. For some people today, beer can serve the same function as it has in the past, being an extra source of calories and safer to drink than untreated water. This reliance on beer is sometimes the case for Tigrayan peoples, living in the remote highlands of Northern Ethiopia where the local beer, Sua, is a dietary staple. Sua, a sorghum beer, and its brewing methods are unique to the Tigrayan highlands. The knowledge of brewing traditional Sua is rapidly

disappearing as more Western-style, commercially brewed beers dominate the once community-based market. In this paper, I present the preliminary findings of a recent two-part study to document the traditional knowledge of Ethiopian women who brew this traditional sorghum/millet beer, and experimentally assess its archaeological visibility through starch and phytolith remains on the brewing vessel. This research focuses on the preservation of traditional brewing knowledge and centralizing the women who maintain these practices, as well as facilitating the archaeological identification of indigenous, non-barley-based beers.

**Babalola, Abidemi (British Museum/Cyprus Institute)**

[60]

*The Stimuli of Technological Inventions*

Technology transfer is a popular concept in the studies of pyro-technologies globally. This concept has been used uncritically in discourses on the origins and development of sophisticated technologies in sub-Saharan Africa. Instead of continuous patronage of this inherently derogatory concept in sub-Saharan African archaeology, this paper discusses three stimuli of technological inventions. Drawing examples from glass making in Ile-Ife, Nigeria, the paper argues that any society with these stimuli is capable of independently inventing novel technology without prior contact. Contact, it argues, is not automatically the driver for inventions.

Bacha-Garza, Roseann [181] see Skowronek, Russell

**Bader, Alyssa (McGill University), Aimée Carbaugh (University of Illinois), Lauren Hosek (University of Colorado) and Krystiana Krupa (University of Illinois, Urbana-Champaign)**

[124]

*Interact! How Do Archaeologists “Care” for Human Ancestors’ Remains?*

Conceptions of “care” are increasingly a topic of interest in anthropological archaeology, and often sit at the intersection of discussions around ethics, best practices, and archaeological research, teaching/training, and curation involving the physical remains of human Ancestors. Care may be perceived as related to preserving the physical integrity of an Ancestor’s physical body, demonstrating respect to and for the Ancestor, and may encompass practices which reflect the Ancestor’s and/or researcher’s worldview and culture. These practices also vary in their implementation, from formalized protocols to individual researcher preference. Here, we consolidate existing discourse around “care” for human Ancestors’ remains. We highlight how care is perceived and enacted in the context of research with Ancestors’ remains and biological materials, teaching and training involving the use of Ancestors’ remains, and curation of Ancestors within archaeological collections. Next, we ask meeting participants to engage with this discourse and reflect on their own training and practices in an interactive survey response format recorded on the poster. The interactive results will demonstrate how archaeologists perceive of and perform care for Ancestors in the context of their own work, as well as how these perceptions and practices are learned and formalized in the field.

Bader, Gregor Donatus [2] see MacDonald, Brandi

Badgley, Ian [132] see Desrosiers, Pierre

**Badillo, Alex (Indiana State University), Aaron Estes (Indiana State University), Zachary Brown (Indiana State University) and Hannah Redlin (Indiana State University)**

[104]

*An Analysis of 3D Mapping Methods of Historic Burials at Bethel Cemetery*

During the summer of 2018, cultural resource management professionals in collaboration with local universities excavated a nineteenth-century cemetery as part of planned infrastructure expansion by the

Indianapolis International Airport. Project managers employed structure-from-motion (SfM) photogrammetry to document burial excavations in lieu of traditional methods of mapping. SfM was not only an expedient and efficient method but also provided project researchers the data necessary for bioarchaeological study. The photogrammetry team had recorded and digitally reconstructed 3D models of over 300 burials. This poster summarizes the procedures for 3D mapping of burial excavations at Bethel Cemetery and presents some of the benefits of using photogrammetric techniques.

Badillo, Alex [50] see Levine, Marc

Badillo, Alex [50] see Zborover, Danny

### **Bae, Hyounggon**

**[220]**

*Faunal Remains and Subsistence Economy of the Gungokri Shell Midden Site (ca. Third Century BCE to Fifth Century CE)*

The Haenam Gungokri site (ca. third century BCE to fifth century CE) is a noteworthy, long-occupied early Iron Age site located along the Baekpo Bay at the southwesternmost coast of the Korean Peninsula. Subsistence economy of the Gungokri occupants, however, is still not well understood due to the limited study on faunal findings. In this paper, zooarchaeological research is conducted to discuss subsistence economy at the Gungokri site. Gungokri is a complex settlement site consisting of a shell midden, a residential area, large-scale structure, dolmen, stone-lid burial, kiln, and a moat. The site helps in establishing the early Iron Age chronology of the Jeonnam region of the southwestern Korea. The early Iron Age cultural features can be further elucidated through the diverse artifacts including pottery, stone and bone tools, iron implements, glass beads, jades, and coins. Through fieldwork, we reconstructed phase-by-phase occupations around the Haenam Baekpo Bay. The site study results suggest that this area is noteworthy due to the active interactions between some of the major maritime and coastal polities. This will lead to a further discussion of how the polities along the coastal Korea interacted and developed ecologically and culturally.

### **Bailey, Caitlyn (California State University, Sacramento) and Jacob Fisher (California State University, Sacramento)**

**[150]**

*Nutritional Benefits of Bone Fat in Rabbits (Leporidae): Implications for Understanding Prehistoric Human Foraging*

Bone fat has been recognized by prehistoric and modern societies as an important source of lipids and other nutrients. Experimental and ethnoarchaeological research have provided a number of archaeological correlates for identifying the role that such nutritional resources were exploited by prehistoric peoples. To date, the bulk of such research has focused on large game resources, yet the nutritional benefits of bone fats may be particularly important for foragers who depend a large degree on small mammals for their subsistence. Here, experimental research is presented to establish the caloric return rates of extracting liquefied bone lipids from leporids, a notoriously fat-poor resource. Using these data in optimal foraging models, including marginal value theorem for carcass processing, will allow us to better understand when intensified culinary processing should be expected and how it affects the overall post-encounter net return rates of leporids. Although the small size and limited meat-fat content of leporids currently ranks them as a lower ranked resource, rabbits may bring more to the table than previously thought when considering both the meat and bone fat calories gained from stewing.

### **Bailey, Christopher (Confederated Tribes of Grand Ronde)**

**[143]**

*Community Outreach in Cultural Preservation*

The Confederated Tribes of Grand Ronde Historic Preservation Office places a high priority on education and public outreach. Looking both within our organization and to outside agencies, the Tribe's Historic Preservation staff places emphasis on addressing past "takings" and harm the discipline of archaeology has

been responsible for in order to create culturally informed practices. In order to broaden awareness within our partner agencies and institutions of the significance of cultural understanding, we have implemented a range of trainings, discussions, and other activities. This programming has taken the form of informational outreach tables, agency specific trainings, youth camping trips, archaeology demonstration days, and more. Our office continues to develop new ways to reach out to a variety of communities in order to better create lasting understanding of issues that we engage on. In this session, I will illustrate the successes that we have had with our outreach and lay out our strategies for future engagement opportunities.

Bailey, Christopher [72] see Pouley, Cheryl

Baisan, Christopher [48] see Kessler, Nicholas

Baisan, Christopher [74] see Larrick, Dakota

Baittinger, Claudia [150] see Pinta, Elie

**Baitzel, Sarah (Washington University, St. Louis), Ian Youth (Washington University, Saint Louis), Dan Rosenburg and Arturo Rivera I. (Independent Researcher)**  
[26]

*Tent City and Midden Islands: Spatial Organization and Domestic Architecture at the Eleventh-Century Los Batanes (Southern Peru)*

In the wake of Tiwanaku state collapse (eleventh century CE), the hyperarid coast of southern Peru became a refugium for diasporic groups who abandoned their homes in the south-central Andean highlands and middle valleys. The reorganization of post-Tiwanaku society in the region manifests in shifting settlement patterns and subsistence strategies, and new material styles and technological innovation. Domestic architecture, as shaped by deeply rooted cultural behaviors and the practicalities of terrain, geography, and building resources, provides a particularly salient lens for examining the transformation of social identities through making and being “at home.” Recent survey and excavations at the site of Los Batanes (500 m asl; Tacna, Peru) identified surface and subsurface architectural features that point to distinct functional, chronological, or social uses of space within the site. Here we integrate multiple lines of data—drone imagery, elevation data from RTK receivers, stratigraphic profiles, and artifact analyses—to obtain a better understanding of spatial organization and occupation across the site. Comparison with earlier and contemporaneous settlements throughout the northern Atacama Desert of southern Peru and northern Chile inform how landscape, land use, and cultural identity factored into the organization and occupation of Los Batanes.

Baitzel, Sarah [29] see Diaz, Lucia

Baitzel, Sarah [28] see Rivera I., Arturo

Baitzel, Sarah [70] see Zhu, Ruoyu

**Bak, Judyta (Jagiellonian University), Angela Lucia Rojas Bergna (National University of San Marcos in Lima) and Juan Carlos La Rosa (Hualmay Municipal Museum)**  
[28]

*A Bioarchaeological Study of a Weaver Mummy from Hualmay, Peru*

In 2010, the archaeological research project in the Los Huacos area of Hualmay discovered a funerary bundle that was named “The Weaver of Hualmay.” It is believed that it corresponds to an adult woman, since associated with the bundle there was a reed basket filled with spinning tools, needles, and cotton, among other items for textile production. The study will involve the application of a medical imaging technique in order to obtain the biological profile, thus, creating the first set of this kind of data related to the prehispanic Hualmay weaving community.

**Baka, Abby (University of Utah)****[88]***Chair***Baka, Abby (University of Utah), Bethany Potter (University of Kansas), Mason Niquette (University of Kansas) and Rolfe Mandel (University of Kansas, Kansas Geological Survey)****[88]***Preliminary Analyses of San Esteban (4IPS20) Lithic Data: Implications for Mobility, Investment, and Dietary Predictions*

Excavations between 2019 and 2022 at San Esteban Rockshelter (4IPS20) in the Big Bend region of West Texas have generated a robust archaeological assemblage. San Esteban can inform on Holocene and, potentially, terminal Pleistocene human behavior in the relatively understudied Big Bend region. By employing Baka's technological investment index and Surovell's behavioral ecological model for lithics and mobility, we investigate changes in diet and occupation length at San Esteban. Investment in chipped-stone hunting and butchering implements suggests reliance on high-return faunal resources while investment in ground stone tools is indicative of intensified use of plant resources. Furthermore, the ratio of debitage to transported tools provides information about the relative length of occupations, as more debitage is generated during longer use episodes. Ultimately, diachronic patterns of technological investment and occupation length provide insight into changes of toolkit composition and mobility strategies in response to climate change throughout the Holocene. Interpretations will be sensitive to San Esteban's history of being looted for large projectile points, which biases toolkit data.

**Baker, Jeffrey (Redhorse Corporation)****[127]***The Geoarchaeology of Playa-Dune Complexes on Edwards Air Force Base*

Archaeologists working in the western Mojave Desert have long assumed that sediments in the region contain limited depth. The playas that dot the landscape are often assumed to have formed at the end of the Pleistocene, with playas having no stratigraphy and no buried cultural deposits. In the Antelope Valley, the dunes that are present are thought to be at least 10,000 years old, and to contain minimal depth.

Archaeologists working on Edwards AFB have frequently argued that it is worthless to dig more than 20 cm into dunes, and more than 10 cm into playas. Over the last five years, research on Edwards AFB has called into question many of these assumptions, with excavations into playas encountering stratigraphic changes and buried cultural deposits. This work has shown that the playa-dune complexes on Edwards AFB have a complex geologic and cultural history. It will be argued that assumptions about the shallow depth of deposits has hindered investigations into the cultural history of the Mojave, and produced a bias toward more recent cultural events. Excavations should be terminated based on the age of sediments rather than the presence or absence of cultural material in a 10 or 20 cm span.

**Baker, Joe (PA DCNR [Retired])****[18]***Chair***[18]***Discussant***Baker, Joe (PA DCNR [Retired])****[187]***Moderator*

Bakovic, Mile [240] see Borovinic, Nikola

Bakovic, Mile [240] see Monnier, Gilliane

Balanzario, Sandra [95] see Alexander, Clara

**Balanzategui, Daniela (UMASS Boston), Barbarita Lara (CONAMUNE-C, Ecuador) and Genesis Delgado (ESPOL, Ecuador)**  
[57]

*Geographies of Black Cimarronaje in the Northern Andes of Ecuador*

Construction of the colonial landscape and its legacies that guide the agendas of neoliberal governments have permitted a series of effects that define that north-central Andes under a historical geography created by the hacienda system and its confluence of human exploitation, forced diaspora, and racist geopolitics, which continues to affect Afro-descendant, rural, and Indigenous peoples. Based in collaborative historical archaeology and a Latin American feminist lens, I present a reflection about Black maroon geographies and fugitivity in Ecuador, specifically in the Chota-Mira Valley. Strategies of Afro-Ecuadorian resistance, and especially Black women and their descendants, propose rewriting landscapes of dispossession and histories of maroonage. These arguments are undertaken by moving through eighteenth-century maroon routes—a sort of fugitive infrastructure—and “counter-mapping” in the Territorio Ancestral Afroecuatoriano. The project proposes a historical revitalization of the territory through land recuperation and official recognition of access to the land.

**Baldwin, J. Dennis (University of Texas, Austin), Thomas Garrison (University of Texas, Austin) and Rafael Cambranes**  
[236]

*A Subjugated Land: Regional Settlement Growth and Consolidation*

The Buena Vista Valley (BVV), encompassing the ancient Maya communities of La Cuernavilla and El Zotz, has been the subject of years of extensive archaeological survey carried out by the Proyecto Arqueológico El Zotz (PAEZ). In 2017 and 2019, the Pacunam Lidar Initiative (PLI) acquired aerial lidar data over the entirety of the El Zotz Biotope in the Petén Department of Guatemala. The density of structures, differing architectural styles, and variety of land-use practices visible on the lidar data suggest a cumulative landscape, shaped by shifting interactions through time. To assess the palimpsest of occupation, PAEZ project members systematically ground-truthed the lidar data, documenting archaeological features and recovering datable material. We analyzed ceramics from looter’s trenches and surface finds, assigning dates to 153 settlement groups. Our analyses indicate that during the Preclassic–Classic transition occupation in the BVV shifted from the valley floor to the elevated margins of the valley, which were often fortified. Against a backdrop of increasing interpolity warfare in Classic Maya society, fear of attack, and increasing competition for control of the BVV corridor motivated the transition from low-lying to elevated areas. Our results provide insights into human behaviors and shifts in settlement patterns in times of conflict.

**Baley, Tyler (Northwest Coast Archaeology Lab), Cameron Blumhardt (Northwest Coast Archaeology Lab), Kate Shantry (Northwest Coast Archaeology Lab), Glen Kirkpatrick (Lewis and Clark Trail Heritage Foundation) and Colin Grier (Northwest Coast Archaeology Lab)**  
[177]

*Finding Fort Clatsop: Results of Fresh Geophysical Surveys and GIS Integration of Past Data*

In 2022, Washington State University archaeologists working in conjunction with the Lewis and Clark Trail Heritage Foundation and the National Parks Service conducted a ground penetrating radar (GPR) survey of the famous Lewis and Clark Trail Heritage Site—Fort Clatsop, Oregon—in a fresh attempt to locate the remains of the fort. Evidence associated with Lewis and Clark’s overwintering in the area has been located and documented, but the actual structural remains of Fort Clatsop have not yet been identified, despite several focused attempts to do so. Re-analysis of the Lewis and Clark journals by Glen Kirkpatrick suggested the fort may be in a different location than previously thought, and GPR survey was employed to evaluate the area. We present the results of the survey, which was conducted under both wet (spring) and dry (fall) conditions in order to increase chances of finding the fort palisade. Historic maps, past geophysical survey

and excavation results, and current project GPR data were integrated into a GIS platform for analysis. In this poster we provide a fine-grained assessment as to whether the remains of the fort exist and can be found.

**Ballance, Matthew (Brown University)**

[190]

*Merchants and Muleteers: A GIS Approach to Movement in the Eighteenth-Century Andes*

*El Lazarillo de Ciegos Caminantes* (1775) describes the colonial highway from Buenos Aires to Lima. Authored by a Spanish official, Alonso Carrió de la Vandra, the document records a uniquely elite experience of travel. The author describes a journey taken from Buenos Aires to Lima structured by the *posta*, a colonial system of lodging and transport infrastructure. Along the same route, historical and archaeological evidence suggests that laborers and herders moved more slowly and often spent the night in ephemeral campsites. This paper presents a GIS reconstruction of the route, alongside elevation based models of horseback and pedestrian travel along it, to argue that the rhythms of movement and rest along it were structured by a traveler's class identity. The colonial elite's view of how travelers should move along roads, traveling on horse or mule between comfortable overnight accommodations, contrasts strongly with how laborers most likely experienced them—as places of arduously slow movement and comparatively plain lodgings.

Ballance, Matthew [69] see Mullins, Patrick

Balsanelli, Alice [242] see Lozada, Josuhé

Bamberg, John [140] see Louderback, Lisbeth

**Bamforth, Douglas**

[24]

*Warrior Art, Osteological Evidence of Violence, and Colonial-Era Changes in Warfare and Male Status on the Western Great Plains*

Indigenous Plains warfare is one of the anthropological archetypes of tribal war, often seen as just as much of a status-related game as real violence directed toward larger social and political ends. This view misrepresents colonial-era warfare by focusing on only one aspect social violence on the Plains, but it also neglects major changes in the scale and organization of violence in the region that resulted from colonization. Rock art and direct evidence of weapons trauma provide complementary and sometimes contrasting evidence of organized violence, including evidence of multiple modes of conflict. Decades of research on Plains rock art especially document well-organized precolonial combat units that disappeared with colonial-era in-migration of new groups, the social changes that followed the introduction of the horse, and possible the effects of epidemic disease. These data underscore the different effects of variable modes of engagement with complex societies on local communities and the active involvement of those communities in processes of change.

Bamforth, Douglas [184] see Carlson, KC (Kristen)

**Banach, Monika (Jagiellonian University) and Mark Howell (Independent scholar)**

[34]

*"This is the true history of the people of Chajul": Selected Aspects of the Narratives and Music of the Tz'unun Dance*  
Baile del Tz'unun is one of the dance-plays performed in the western highlands of Guatemala. In the past it was an annual celebration in Chajul. It is also present in Aguacatan, and there is a documented history of musical exchange between these two regions. Oral tradition associated to the Baile del Tz'unun as well as in the same time to petitioning ceremonies is based on narratives that are some of the vital elements of the Ixil

cosmovision and ritual life. In this paper we discuss the history and cultural meaning of the mythos and examine some of the baile's (dance-play's) musical components. Apart from selected narratives of oral tradition and history, as well as music collected during recent ethnographic fieldwork, we also refer to some earlier ethnographic and ethnoarchaeomusicological material. Moreover, the Ixil textile art is also one of the important texts and sources that records this narrative. It is also possible that the dance-play could be one of the motifs depicted on the colonial mural art located in some of the houses in Chajul so we base our analysis in this context.

**Banda, Marko (University of Zagreb)**

[47]

*Middle Paleolithic Land Use in the Northern Adriatic: Preliminary Data from the Open-Air Site of Campanož (Croatia)*

The site of Campanož, located in the south of the Istrian peninsula, is a relatively new discovery of the Middle Paleolithic record of Croatia. Because it is a stratified open-air site, its discovery has opened questions regarding Middle Paleolithic land use in a region that has until now been heavily biased toward cave sites. Furthermore, the site is characterized by a large assemblage of chert chunks (more than 100,000 in 100 m<sup>2</sup>) with only 5% of the finds classified as artifacts. A sample of the artifact assemblage was previously analyzed technologically, including defining production methods and the assemblage structure according to technological categories. The results are compared to previously published data from other Middle Paleolithic sites in the Adriatic region, as well as some still unpublished data from the Eastern Adriatic in order to highlight the character of land use and raw-material provisioning strategies of the Middle Paleolithic group(s) that occupied the site. The comparison suggests a presence of an expedient lithic technology at Campanož, with proximity to raw-material source(s) comprising a significant factor in this aspect of Middle Paleolithic technological behavior.

**Bandama, Foreman (Field Museum of Natural History; University of Illinois, Chicago)**

[210]

*Glass Beads from Bumbusi in Northwest Zimbabwe: Intersection of History and Archaeology*

The northwestern parts of Zimbabwe lie at a critical junction between the Indian and Atlantic Oceans and—during the late Iron Age—witnessed major cultural changes. This includes possible migrations historically tied to the decline of major states to the south. Beads lubricated these transformations, making it possible to connect with areas from outside the continent. We analyzed glass beads from the site of Bumbusi that is historically linked with Great Zimbabwe. While the chemistry confirms overlaps with Great Zimbabwe, the timing does not fit very well with the historical picture.

**Bánffy, Eszter**

[163]

*Bioarchaeological versus Archaeological Data on the Beginnings of Southeast and Central European Early Neolithic*

The short paper focuses on Early Neolithic continental Europe, with presenting new archaeological results compared to similarly recent ancient DNA and stable isotope studies. I shall address various scenarios from selected regions in the Balkans, in northern Germany before zooming in the eastern and western part of the Carpathian basin. Here again, possibilities to reconcile aDNA data with the archaeological record, as well as some contradictions, but above all, the utterly high diversity of ways of the Neolithic transition will be highlighted.

**Banke, Peter (University of Nevada, Reno), Christopher Jazwa (University of Nevada, Reno) and Jennifer Perry (California State University, Channel Islands)**

[42]

*Outcrops, Toolstone Distribution, and Source Profiles of Chert Quarries on Santa Cruz Island, CA*

In this poster, we synthesize the body of previous and continuing research of chert quarries on the East End

and Isthmus of Santa Cruz Island, CA since 1985. Santa Cruz Island chert quarries have been integral to interpretations of craft specialization, the development of social complexity, and material conveyance among peoples on the Northern Channel Islands and adjacent mainland throughout the Holocene. Systematic surveys of the East End and adjacent Montañón region have resulted in the documentation of 26 chert quarries, and we have identified previously undocumented chert quarries and material sources during recent backcountry surveys in the Isthmus region. Recorded chert outcrops East of the Isthmus are typically located at geologic contacts between the Monterey and Volcanic formations where volcanic uplift has made them accessible from Montañón Ridge. On the Isthmus chert outcrops are present along ridgelines, and chert nodules are present in deep canyons and drainages. Pilot studies for chert provenance methods have been conducted with pXRF and LA-TOF-ICP-MS on some chert quarries on Eastern Santa Cruz Island with preliminary success. This synthesis provides a baseline for future research into exchange, intensification, material accessibility, quality, and provenance regarding chert quarries on Santa Cruz Island.

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

[156]

*Moderator*

Bankuti-Summers, Natalie [74] see Messinger, Emma

**Bao, Yige (University of Minnesota, Twin Cities), Matthew Collins (University of Cambridge, University of Copenhagen), Eugene Morin (Trent University), Marta Alegre (University of Cambridge) and Gilliane Monnier (University of Minnesota)**

[240]

*Using ZooMS to Reconstruct Neanderthal Faunal Exploitation in the Early Sequence of Crvena Stijena, Montenegro*  
Crvena Stijena is one of the most significant Paleolithic sites in southeastern Europe. Although scientific excavations conducted here in the 1950s, 1960s, and since 2004 have uncovered several Middle Paleolithic faunal assemblages, the results of the early excavations were not quantified, while the latter has not yet reached the deeper levels. To better comprehend the Neanderthal paleodiet during the past 80,000 years, it is preferable to increase the sample size for the older layers where the number of faunal remains is small. Unidentifiable bone fragments sampled from the south and east profiles in Crvena Stijena were therefore analyzed using ZooMS (zooarchaeology by mass spectrometry). This study applies paleoproteomic techniques to ancient archaeological specimens of varying preservation conditions in order to shed further light on patterns of faunal exploitation at the site.

**Baram, Uzi (New College of Florida)**

[225]

*Maroon Ritual Belongings Excavated on Gulf Coast Florida*

Nearly erased from history, the early nineteenth-century marronage of Angola on the Manatee River is now established as part of the Network to Freedom in Florida. Recent excavations provide a view of daily life for the freedom-seeking people. Allied with British filibusters, connected to Seminole peoples in the Florida interior and Cuban fishing ranchos along the Gulf Coast, and building a haven of freedom, Angola may have included more than 700 people. The Manatee River marronage was part of the struggle against slavery that stretched from Prospect Bluff to Andros Island during the early nineteenth century. Material remains support situating the maroons in the crosscurrents of the Atlantic world. Among the findings from 2020 excavations by the Manatee Mineral Spring, two small objects buried in separate small pits are interpreted as ritual belongings. This paper provides an overview of the decade-long community-based research, the excavations and an overview of its findings, and an assessment of the objects. The research has been collaborative, working with descendants and local communities to connect past and present as heritage.

Barba Pingarrón, Luis [100] see Hernández Sariñana, Daniela

**Barbacini, Emma**

[105]

*Medieval Medicine Board Game: Saving Ancient Studies*

The Archaeogaming Team at SASA turns games into the backdrop of history; this project loops full circle, turning history into a game. Born as support material to an AEM that explores the history of medieval medicine, this game is meant to familiarize the players with relevant vocabulary and techniques. It further aims to help students see the method to the madness of medieval doctors—this being, try with the available knowledge until something works and transmit it. Through travel, healing, and bartering, the players attempt to get into one of the main universities of medieval Europe; meanwhile, they memorize symptoms and illnesses. This poster aims to present research and sources that went into developing the elements of the game—e.g., “herb cards” illustrated with miniatures, infamous illnesses, and four playing avatars inspired by real-life figures, with custom-made illustrations. It also showcases how applying the information learned during the module in scenarios of the game cements it: vocabulary is reinforced, interesting facts turn up in different forms, and as a bonus some European geography is reawakened. In short, it proposes to be a portrait of the balance between pedagogy, accuracy, and fun that the game tries to strike.

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

[146]

*Discussant*

Barber, Sarah [175] see Mayes, Arion

Barbier, Brian [10] see Brown, Kaitlin

**Barbour, Britannia (University of Idaho)**

[102]

*An Investigation into Topographic Distribution Patterns Associated with Wetlands Surrounding Bog Body Burial Sites*  
History is imprinted in our landscapes, and the creation of bog deathscapes indicates the agency of wetland environments to the mortuary customs of European Iron Age and North American Archaic Age communities. The functionality and ideological value of bog landscapes vary spatially and temporally, yet there is a unilateral use of bogs as unique burial grounds between diversely located cultures. This presentation examines why there are significant resemblances in bog body burial customs, despite the extensive spatial and cultural separation, and how topography influenced five bog body burial sites: four Northwestern European wetlands sites and a singular mass Archaic American burial. Previous scholarship focused on the osteological and cultural aspects of bog bodies and their violent deaths, along with the ecology of peat wetlands. However, few sources use geospatial analysis to assess geographic aspects which influenced the similarities of distinctive bog body burials. To understand the agency of the distribution of topographic patterns that guided these burial choices, this research examines the functionality and ideological value of bog landscapes and what trends are visible in each terrain to determine the reasoning for such remarkable similarities in the overall treatment and placement of the dead across time and space.

**Barcelo, Jorge (Archaeology Southwest) and Allen Denoyer (Archaeology Southwest)**

[199]

*Comparison of Hafting Adhesive Strengths in Lithic Tools*

Pine pitch is a form of glue whose main ingredients are pine resin and some sort of fibrous binder. There are various recipes that involve using different binders such as herbivore dung, ash, and organic fibers. Some

formulas also call for beeswax or a form of fat to keep the pitch pliable and resist brittleness. Lac, which comes from the creosote bush, is also a potential candidate as a glue that needs no additives. It is not a secretion of the plant like pine resin, but comes from the lac insect that lives on the plant. Testing the strengths of these different types of adhesives and comparing the results provides useful information into what was used to haft flaked stone tools in the past.

**Bardolph, Dana (Northern Illinois University), Christina Friberg (Indiana University) and Gregory Wilson (University of California, Santa Barbara)**  
[217]

*Redrawing the Arrows of Mississippianization to and from the Central Illinois River Valley*

The rise of Cahokia, the largest precolumbian Native American city north of Mexico, and the rapid spread of Mississippian culture across the midcontinental and southeastern United States after 1000 CE have long been a focus of archaeological inquiry. From early theories of cultural diffusion to more recent scholarship on diaspora and migration, scholars have continued to debate the complexity, historicity, and directionality of the centrifugal and centripetal movements tied to this unique and monumental place. Using the Central Illinois River Valley (CIRV) as a case study, we offer a unique take on Mississippian origins and the history of culture contact in Cahokia's northern hinterlands. We present data from our recent excavations at Fandel Mounds, the earliest Mississippian mound center in the Peoria Lake area, which was founded simultaneously with Cahokia ca. 1050 CE. Transcending an older "arrows out of Cahokia" narrative that conjured up notions of high-status Cahokians heading off to distant lands with fully formed Mississippian ideas and practices that were then emulated by hinterland groups, we argue that the social and political interactions at Fandel Mounds, including religious ceremonialism, helped constitute the means through which Mississippian culture emerged in the greater Cahokia area and beyond.

Bardolph, Dana [43] see Chitwood, Anna

Bardolph, Dana [46] see Raab, Bailey

Bardolph, Dana [103] see Westendorff, Milsy

Barfod, Gry [210] see Merchant, Joe

**Barket, Theresa (California State University, Los Angeles), Lisa Maher (University of California, Berkeley), Danielle Macdonald (University of Tulsa) and Felicia DePena (Statistical Research Inc.)**

[171]

*One Person's Waste Is an Archaeologist's Treasure: Using Techno-Typological Analysis of Debitage for Epipaleolithic Assemblages*

Stone tools have long been used by archaeologists as markers of cultural affiliation in prehistoric cultures. The Epipaleolithic (EP) of Southwest Asia (approx. 23,000–11,500 yrs BP) is no different; here microlith types are regularly used as signifiers of geographically and chronologically bounded cultural groups, social groups, or ethnic identity. However, the overreliance on retouched tools, especially microliths, neglects the largest component of most assemblages, the debitage. Without a detailed analysis of debitage types, and their modes of production, the technological processes by which these assemblages are made are lost. Analyses that focus equally on the products and byproducts produced in stone tool production provides valuable insight into systems of knowledge transfer, community learning, and local traditions of manufacturing technology. Therefore, the primary goals of our techno-typological approach, based on replicative research, is to improve inter- and intra-analyst identifications, as well as consider the full range lithic artifacts in the assessment of a site's assemblage. To demonstrate the potential interpretive benefits of this approach, we apply this techno-typology to understanding EP stone tools and their debris from the Early and Middle EP site of Kharaneh IV, Jordan.

Barket, Theresa [171] see Macdonald, Danielle

Barket, Theresa [171] see Maher, Lisa

Barkett-Jones, Kaylee [180] see DeGraffenried, Jennifer

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

**[199]**

*Reassessing Mimbres Mogollon Red-Slipped Pottery*

The red-slipped pottery associated with Mimbres Mogollon pithouses seldom gets much attention, and the typology and chronology of these red-slipped ceramics are not well understood. This poster presents the results of an attribute analysis on the red-slipped pottery from seven Mimbres Mogollon sites as well as Bayesian chronological modeling of pithouse sites associated with the red-slipped pottery. The analysis suggests that the early, red-slipped pottery is not just Alma Plain with some red slip. Furthermore, Bayesian chronological modeling of structures associated with the red-slipped pottery raises some questions regarding the traditional Mimbres Mogollon chronology. This poster will discuss the broader implications of these findings for the Mimbres Mogollon Pithouse period.

Barnes, Benjamin [19] see Henderson, A. Gwynn

**Baron, Joanne (Dumbarton Oaks Research Library and Collection)**

**[83]**

*Discussant*

**Baron, Joanne (Dumbarton Oaks Research Library and Collection), Frauke Sachse (Dumbarton Oaks Research Library and Collection) and Daniel Boomhower (Dumbarton Oaks Research Library and Collection)**

**[238]**

*Understanding the World of the Scribe: Challenges and Opportunities of Cataloguing the Kerr Photographic Collection of Maya Art at Dumbarton Oaks*

The majority of photographs in *The Maya Scribe and His World* were taken by Justin Kerr. Kerr's development of rollout photography transformed the field, allowing Maya ceramics to be documented and studied more easily. With the creation of the searchable online database Mayavase.com, Kerr made his substantial photographic corpus of objects in public and private collections accessible through the internet. The technology and availability of the images significantly advanced our understanding of the texts and scenes displayed in Maya art. In 2013, Justin Kerr donated his photographic collection to Dumbarton Oaks. Building on his work at Mayavase.com, we are working to create a digital catalogue of the material that will serve both specialist and non-specialist users. One of the challenges in making the images searchable through a digital infrastructure is the heterogeneous vocabulary used to describe Maya art over time. Many of the terms in the Grolier catalogue and other publications are based on European concepts and were coined before the relevant Maya texts could be read. In the spirit of the SAA's ethical principles of Stewardship, Accountability, Education, and Outreach, we aim to develop new terminological standards based on hieroglyphic readings that are respectful toward descendant communities.

Barrett, James [63] see Van Den Hurk, Youri

**Barrett, Matthew (University of Auckland) and Simon Holdaway (University of Auckland)****[33]***Simulating Lithic Assemblage Composition and Its Relationship to Mobility*

Artifact density and techno-morphological form distribution in lithic assemblages are often used to make inferences about mobility. However, the relationship between such observations and mobility strategies varies with socio-natural contexts, leading to contrasting interpretations of the same data. To overcome such indeterminacy, we investigate the physical movement of artifacts as a proxy for the movement of people. An exploratory agent-based simulation indicates how different combinations of lithic reduction, reuse, selection, and transport affect assemblage composition, modeled using nodules of raw material (cores) and the pieces of stone struck from them (flakes). The simulated artifact distributions serve as hypotheses that are tested with empirical data from two surface stone artifact assemblages from semiarid Australia: one low-density record dating to the late Pleistocene, where raw material is not locally available; and one higher-density record from the late Holocene from a context of raw material abundance. These records should exhibit differences in formational processes and the use of stone. However, thought of in relation to the simulation outcomes, similarities in place use are suggested for both records, with a similar set of simple processes responsible for the emergent patterning observed.

**Barrick, Emily (Pima Community College)****[199]***Comparative Distribution of Kayenta Ground Stone in Hohokam and Mogollon Salado Sites*

Ground stone is a ubiquitous artifact type throughout the Southwest after the advent of agriculture, and a useful indicator of technology, cultural variation, and individual preference. During the Salado phenomenon in southwest New Mexico and southeast Arizona (~AD 1300–1450), it became a distinguishing artifact type between regional locals, the Mogollon and Hohokam, and Kayenta or Ancestral Puebloan immigrants from the north. This poster hopes to look at the difference in presence and distribution of finger-groove manos and full-groove ax heads in the Upper Gila region versus the San Pedro region, to examine the differences in how the technology was used and received when in contact with two different cultural spheres.

Barrientos, Aura [127] see Dober, Joseph

Barrientos, Aura [154] see Hannold, Cynthia

**Barrientos, Tomas (Universidad del Valle de Guatemala) and Marcello Canuto (Tulane University)****[93]***Shifting Regimes at La Corona: Political Resilience of Classic Maya “Secondary” Center*

Data from investigations at the archaeological site of La Corona reflect the role that secondary sites had for political integration in the Maya lowlands. Comparing what the hieroglyphic texts suggest with what the material culture of the secondary sites indicates, it is possible to assess the nature of La Corona political regime before, during, and after its alliance with the Kaanul dynasty. This case provides not only a unique opportunity to characterize a site either under the influence of or in association with one of the most dominant political entities in Maya history but also to analyze how it managed to be resilient after the Kaanul decline. In fact, La Corona experienced a short apogee when it ceased to be under that influence, something that suggests the development of a new regime. In sum, this paper aims to demonstrate the high degree of variability and dynamism of political regimes among Maya Lowland polities during the Classic period.

Barrientos, Tomas [93] see Lamoureux-St-Hilaire, Maxime

Barrientos, Tomas [238] see Ponce, Jocelyne

**Barrios, Edy (CUDEP-USAC)****[85]***Chair***[186]***Discussant***Barrios, Edy (CUDEP-USAC), Cameron McNeil (CUNY) and Mauricio Díaz García (Graduate Center, CUNY)****[85]***Río Amarillo's Temazcal: Fertility, Toads, and Childbirth in the Copan Valley, Honduras*

In 2014, rescue excavations in a residential group on the outskirts of Río Amarillo, 20 km from the ancient center of Copan, revealed the presence of a *Pib Naah* (temazcal/sweat bath), with clear ties to women's rituals and Maya concepts of fertility. This evidence led the author to name this structure and the three associated with it "The Midwives' Group." This group contained a large number of manos and metates (more than found elsewhere in PARAC's excavations) suggesting that women ground maize while waiting for the birth of children. Several artifacts were found with clear associations to fertility and women, including a Copador vessel in the form of a toad, a second toad carved from stone, and a figurine of a goddess holding a child, or a small spirit being. Structure 3, the only one without female-associated artifacts, may have been a shrine. Shattered figurines were found off its corner, one of which may have been from a censer lid in the form of K'inich Yax K'uk' Mo'.

Barrios, Edy [52] see McNeil, Cameron

Barrocas Dias, Cristina [118] see Richter, Kristine

Barton, Loukas [21] see Brady, Ryan

Barzilai, Omri [127] see Belmaker, Miriam

**Barzilai, Rebecca (Indiana University) and Jayne-Leigh Thomas (Indiana University)****[111]***Looking for Evidence of Corn Processing (Nixtamalization) at Angel Mounds*

Mississippian peoples (circa eleventh–fourteenth centuries CE) in the midwestern and southeastern United States have long been proven to be and defined by their maize agricultural practices. Due to the nutritional deficiencies of subsisting solely on maize as a crop when unprocessed, researchers have linked all maize agricultural communities found archaeologically to subsist on maize to this processing step, although direct evidence in all regions has not been fully examined. Known in ethnohistoric contexts, most particularly in Mesoamerican cultures, nixtamalization is the processing of maize in an alkaline solution to break down the complex carbohydrates in maize to get the most nutrition from indigenous corn varieties found archaeologically in the region (Benchley, Elizabeth D., 2003, Mississippian Alkali Processing of Corn, *Wisconsin Archeologist* 84:127–137). In certain Mississippian communities, specialized artifact types have been identified for this processing, primarily identified by a lime residue present on the exterior of the artifacts (e.g., Betzenhauser, Alleen, Victoria Potter, and Sarah Harken, 2017, Investigating Stumpware: Evidence for Pre-Mississippian Nixtamalization in Illinois, *SAA Proceedings* 74:44). This study looks for similar specialized equipment and traces on artifacts at the Mississippian mound center of Angel Mounds near Evansville, Indiana.

**Basanti, Dilpreet (Northwestern University)****[175]***Reconstructing the Social Life of Death at Ancient Aksum through Micro-CT Imaging (AD 50–400)*

This paper presents micro-CT histological data on bone samples from Aksum's Stelae Park cemetery (AD 50–400). Aksum was the capital of an ancient polity (AD 50–800) that spread across the northern Horn of Africa and was a major global power in the Indian Ocean trade. The most notable lasting remains of the ancient capital are its towering funerary monuments and elaborate tomb complexes. Human remains from Aksumite tombs previously demonstrated systematic patterns of cut marks consistent with postmortem ritual processing. In consideration, micro-CT imaging was conducted on ~20 ancient bone samples that revealed heavy bacterial bioerosion throughout all samples suggesting only a short postmortem interval prior to burial. Cut-mark distribution suggested remains were later disinterred—perhaps not more than 1–2 years after burial. Additionally, targeted areas of density loss could be quantified and compared between bone samples. These data aid in reevaluating previously excavated features that likely relate to the identified postmortem processing rites. Most importantly, these results work in concert with other lines of data that indicate Aksumite mortuary practices were important domains of negotiating “local” vs. “global,” and reveal how Aksumites dramatically reinvented their death rites in creating new identities during periods of increasing globalization.

Basarte, Daryl [105] see Cipolla, Lisa

Basri, Pertev [142] see Lawrence, Dan

**Bassett, Hayden (Virginia Museum of Natural History), Madeleine Gunter-Bassett (Virginia Museum of Natural History), William Welsh (Virginia Museum of Natural History) and Kate Harrell (Virginia Museum of Natural History)****[30]***Documenting Damage to Cultural Property in Ukraine*

Current events have demonstrated that the archaeological sites, museums, and historic structures that compose the cultural landscape of Ukraine are suffering in the current conflict. In this poster, we summarize the recent collaborative efforts of the Cultural Heritage Monitoring Lab (CHML), Smithsonian Cultural Rescue Initiative (SCRI), and University of Maryland (UMD) to document cultural heritage loss and support cultural property protection (CPP) measures in Ukraine. Covering efforts since the beginning of the conflict, we outline: (1) our approach to satellite-based identification of potential and confirmed impacts to cultural heritage sites; (2) our documentation of conflict-related damage to cultural heritage as a part of the Conflict Observatory; and (3) our support to on-the-ground preservation of cultural heritage. Together, these efforts contribute to the combined goals of rapid identification and communication of damage/loss, documentation for accountability, and direct support to cultural heritage professionals in Ukraine.

Bassett, Hayden [72] see Welsh, William

**Batalla, Arlys Nicolás (University of São Paulo), Astolfo Araujo (University of São Paulo), Mercedes Okumura (University of São Paulo) and Casimiro Munita (Nuclear and Energy Research Institute)****[148]***A Shell Mound in a Rockshelter? Geoarchaeological Analysis of Shell-Bearing Facies at Maximiano Rockshelter, Iporanga County, São Paulo State, SE Brazil*

The Maximiano archaeological site consists of a limestone rockshelter embedded in the Brazilian tropical Atlantic Forest of SE Brazil. Excavated in the late 1970s by an amateur archaeologist, this 40 × 5 × 3 m rockshelter setting contains lithics, bone artifacts, and faunal and human remains dating between ~11,712 and 6796 cal yr BP. Located in a region known for its presence of fluvial shell mound sites, the origin of different

types of shell-containing deposits present in the stratigraphy of the Maximiano rockshelter have, notwithstanding, remained an object of debate. This work presents the results of micromorphological and geochemical analyses of early to mid-Holocene shell-bearing facies from the site which attest to their anthropogenic nature. Results suggest deposition (tossing) and subsequent reworking of gastropod shells, charcoal, ashes, and bone in different concentrations, as well as the possible raking out of combustion features. The findings are compared with other shell mound and rockshelter sites in Brazil and around the world where similar analyses have been performed.

**Batres, Kimberly, Neil Duncan (University of Central Florida), Lana Williams (University of Central Florida), Brigitte Kovacevich (University of Central Florida) and Michael Callaghan (University of Central Florida)**

[43]

*A Paleoethnobotanical Analysis of Ceramic Residues from Caches and Burials at the Lowland Maya Site of Holtun, Guatemala*

Among the Maya, plant-based foods were not just important for sustenance but also had ritual meaning, especially emphasized when placed in graves and caches. Food offered during ritual performances created a reciprocal relationship between living individuals, their ancestors, and the gods. This poster will present the paleoethnobotanical results from examination of seven ceramic sherds from the Preclassic through the Terminal Classic periods (800 BC–AD 900) associated with burial and cache offerings from the lowland Maya site of Holtun, Guatemala. Each whole vessel fragment was subjected to starch analysis, a method used to determine plant taxa on a microscopic level, as well as high-performance liquid chromatography and Raman spectroscopy to test for cacao residues. The identification of crops, aside from the usual suspects like maize and cacao, such as manioc, yam, and malanga, suggest evidence of a complex ritual diet of the residents at Holtun. Although the environmental conditions of the Maya Lowlands can lead to poor preservation, the results gathered from the preliminary starch and chemical residue analyses at Holtun indicate our ability to recover diverse plant remains from archaeological contexts and illuminate possible patterns of grave and offering types, social class, and variety in ritual diet.

**Battaglia, Mario**

[234]

*Successes and Challenges of Documenting Traditional Cultural Properties/Places*

Documenting traditional cultural properties/places (TCPs) have become much more commonplace in the world of cultural resource management. Increasingly, more and more tribes and descendant communities across the United States have successfully identified, documented, and in some cases, nominated TCPs to the National Register of Historic Places. Although TCPs have created a useful framework in which to identify and record multivalent, complex, and dynamic cultural places, there are still many challenges when working to translate tribal concepts of place into the Section 106 process of the National Historic Preservation Act. This paper uses several case studies to unpack and discuss some of those challenges that have arisen during the TCP identification and documentation process, and presents some strategies used in the face of those challenges.

**Batty, Sylvia (Galen University), Josue Ramos (Institute of Archaeology), Antonio Beardall (Texas State University), Debra Wilkes Gray (Independent Researcher) and Cynthia Robin (Northwestern University)**

[243]

*Community and Collaboration at Aventura*

With a five millennia history spanning forager-horticulturalist, precolumbian Maya, historic, and contemporary periods, Aventura is a community with a long history. The Aventura Archaeology Project addresses community at many levels, in its study of the past and in its collaboration with local cultural heritage leaders and community members to promote archaeology in Northern Belize. This paper discusses the initiation of the Aventura Archaeology Project through discussion with government officials, cultural heritage leaders, and

farmers in Belize. We trace the development and implementation of a series of community education programs in Northern Belize that grew out of partnerships between the Aventura Archaeology Project, the Belize Institute of Archaeology, the Belize Institute of Social and Cultural Research, the Corozal House of Culture, the San Joaquin RC Church summer school, and the San Joaquin Village Council. These include a community fair called Aventura Archaeology Day, a weeklong teacher, tour guide, and community workshop series called Ancient World Week, and an elementary school-age summer camp experience. Through the mutually beneficial goals of archaeological research and education the Aventura Archaeology Project seeks to develop a richer understanding of community past and present through archaeology and collaboration.

**Bauer, Andrew (Stanford University)**

[233]

*The Politics of Soils on the Medieval Deccan, Southern India*

This paper considers the politics of soils on the Medieval Deccan. Drawing on inscriptional stelae that record land donations and distinctions, multi-spectral remote sensing datasets, micromorphological analyses, and archaeological survey results, it evaluates how the classification, distribution, and use of different soil series during the medieval period fomented social concerns and ultimately generated public resistance to some modes of temple patronage and economic practices. In doing so, the paper also critically addresses the utility of “new materialist” frameworks for evaluating soils and sediments as political actants in this socio-historical context.

Baumann, Steve [81] see Poister, Nicholas

**Baustian, Kathryn (Skidmore College), Clair Ralston (University of Nevada, Las Vegas), Maryann Calleja (Defense POW/MIA Accounting Agency) and Debra Martin (University of Nevada, Las Vegas)**

[227]

*Women as Actors in Systems of Violence: Their Roles and Identities in the Precolonial US Southwest*

When examining violence in archaeological contexts, the roles of females have often been undertheorized or omitted completely. Violence research is quick to identify males as warriors and aggressors but women should not be ignored as actors in past violence. Our perception and interpretation of females as actively engaged in violent interactions in the past is shaped by our own social conditioning, cultural frameworks, and lived experiences. What is considered violence in one society may not be so in others. In an effort to provide a more nuanced representation of the women living in the ancient Southwest, we conducted a bioarchaeological analysis of skeletal remains from several Mogollon sites (Point of Pines, Grasshopper, Turkey Creek, and numerous Mimbres sites) with a focus on injuries sustained, disease processes, and musculoskeletal development. We then considered the results in relation to mortuary contexts, social processes, and cultural structures that sanctioned and encouraged interpersonal and gendered patterns of violence. This research considers the agency of women in times of conflict with a goal of identifying how women were more than just victims of violence, but also occasionally aggressors, defenders, or supporters of warfare and raiding in the precolonial Southwest.

Baustian, Kathryn [227] see Harrod, Ryan

**Baxley, Aleta (Equinox Research and Consulting International Inc), Rhododendron O’Boyle (Equinox Research and Consulting International Inc), Rachel Pinkman (University of Memphis) and Alexandra Ritter (Espinoza Consulting Services)**

[71]

*Use of Faunal Analysis to Examine Seismic Disturbance at 45WH10 in Birch Bay, Washington*

Faunal analysis and taphonomic observations of marine invertebrates in a legacy collection from 45WH10 in Birch Bay, Washington, demonstrated a shift in taxonomic abundance that we hypothesize may be indicative

of seismic activity such as an earthquake-induced tsunami. Samples from three units showed a significant shift in the abundance of *Nucella* gastropods and *Saxidomus* bivalves, taxa that occupy different habitats. A high concentration of *Nucella* with postmortem bioerosion in specific levels suggests that they were not deposited as a result of human activity. In conjunction with the abrupt shift in taxa, this could be indicative of a natural high energy event related to tectonic activity on the Birch Bay Fault.

**Baxter, Erin (Denver Museum of Nature & Science), Steve Nash (Denver Museum of Nature & Science), Michele Koons (Denver Museum of Nature & Science) and Erick Robinson (Boise State University)**

[137]

*Bayesian-Based Rethink on AMS Dates from Tularosa Cave, NM*

Seventy years after the Field Museum's excavation at Tularosa Cave (1000 BCE–AD 1200) in the Mogollon Highlands of west-central New Mexico, its stratigraphic integrity remains a contentious topic. Bayesian analysis on a series of new AMS dates from sandals and corn found within different levels of the cave demonstrate that much of the stratigraphy is likely intact and that usable data is extractable. We suggest that these new dates, coupled with new analyses of field methods, pottery, and field notes will unlock the cave's chronology. This will ultimately bring us closer to a far better understanding of the chronology of the Mogollon Highlands.

**Baxter, Paul (Museum of Natural and Cultural History, U. Oregon)**

[62]

*Cascadia Cave, the Excavations*

Cascadia Cave (35LIN11) is an iconic rockshelter and rock art site at the edge of Oregon's Willamette Valley and Western Cascade Range. Following excavations in 1964, Tom Newman reported an early Holocene radiocarbon age of 8810 cal BP and a Cascade projectile point assemblage that was central to what has come to be known as the Old Cordilleran Tradition. In 1988 the site was revisited as part of a National Register nomination and an additional small-scale excavation was done. An evaluation of these efforts, supplemented by seven new radiocarbon dates and obsidian hydration age estimates, show the site was intensely occupied from at least the early to middle Holocene (9500–4500 years BP), after which occupation was more ephemeral and intermittent. The reanalysis clarifies the place of Cascadia Cave in the context of the Willamette Valley's environmental and cultural history. Further, an overview of the rock art may provide archaeological evidence of the historic incursion into the Willamette Valley by the mid-Columbia River Klickitat.

**Baxter, R. Scott (Pacific Legacy)**

[98]

*Summit Camp*

Summit Camp was occupied by Chinese railroad workers from 1864 to 1869. It was the longest occupied camp associated with the building of the transcontinental railroad. Workers from the camp excavated a series of tunnels through the granite bedrock of the Sierra Nevada Mountains. The Sierras were the greatest hurdle for the railroad, and, without the efforts of the Chinese residents of Summit Camp, the project could not have been completed. In the 1920s, US 40 was built adjacent to the former construction camp at its scenic location in Donner Pass. With the camp's importance to the railroad, and its accessibility to the public, it became a well-known and much visited site of historical interest. Since the 1960s, Summit Camp has been recognized as an important archaeological site; however, it was never formally elevated above the status of "potentially eligible" for the National Register of Historic Places. It took the efforts of an avocational group dedicated to the promotion of the nineteenth-century Chinese experience to spur things into action. Today a number of private parties, nonprofit organizations, and governmental agencies are jointly working toward formal recognition of Summit Camp as a significant cultural, historical, and archaeological site.

Bayarsaikhan, Jamsranjav [244] see Miller, Bryan  
 Bayarsaikhan, Jamsranjav [244] see Taylor, William

**Bayman, James (University of Hawaii)**  
**[207]**

*Discussant*

Bayman, James [113] see De La Cruz Roldan, Antonio Ricardo  
 Bayman, James [49] see Peterson, John

Bazaliiskii, Vladimir [53] see Lieverse, Angela

Bazan, Augusto [63] see Vining, Benjamin

**Beach, Timothy (University of Texas, Austin), Byron Smith (University of Texas, Austin) and Sheryl Luzzadder-Beach (University of Texas, Austin)**  
**[236]**

*Paleoecology and Geoarchaeology of the Buenavista Valley, Petén, Guatemala*

We have studied the long-term environmental change and geoarchaeology of the Buenavista Valley in the region of El Zotz and La Cuernavilla in Guatemala's Petén through multiple NSF grants from the 2000s to an NGS Grant for fieldwork in 2022. Past studies focused on the El Zotz reservoir, other regional reservoirs, dam construction, and paleoecological records from the sediments of the El Palmar cival and the El Zotz reservoir. The El Palmar cival coring evidence indicated steady maize pollen and charcoal from the earliest samples in the Middle Preclassic to at least the Terminal Classic, though the adjacent settlement fell into decline by the Early Classic. Lidar evidence from around the cival and across the Petén indicated many other possible instances of canals and wetland fields. To test these wetland fields, we excavated and cored a prominent canalized field system and cored the nearby La Cuernavilla cival to depth over 3 m. The excavations uncovered numerous lithics and ceramics mostly dated to the Preclassic. Here we present these findings from the 2022 field campaign as well as stratigraphy, dating evidence, geochemistry, and aDNA evidence to test our earlier interpretations and whether this is an example of upland, bajo, wetland agriculture.

Beach, Timothy [54] see Character, Leila  
 Beach, Timothy [17] see Cook, Duncan  
 Beach, Timothy [54] see Doyle, Colin  
 Beach, Timothy [54] see Flood, Jonathan  
 Beach, Timothy [54] see Krause, Samantha  
 Beach, Timothy [236] see Landa, Yesenia  
 Beach, Timothy [17] see Luzzadder-Beach, Sheryl  
 Beach, Timothy [54] see Sánchez-Morales, Lara  
 Beach, Timothy [54] see Smith, Byron

**Beahm, Emily (Arkansas Archeological Survey) and Angela Gore (Arkansas Archeological Survey)**  
**[241]**

*Ozark Imagery: Documenting Rock Art in the Arkansas Highlands*

The first published account of Arkansas rock art appeared in the late nineteenth century when public museums and other institutions relied on private citizens as well as professional scholars to report all manner of scientific facts and discoveries. The Arkansas state site files include reports of rock art sites from casual

observers to rigorous academic scientists, and everything in between; therefore, documentation type and thoroughness varies a great deal among sites. This paper outlines efforts of the Arkansas Archeological Survey's Winthrop Rockefeller Institute Research Station to verify reported rock art created by Indigenous people, collate records of rock art sites reaching back to the 1930s, monitor rock art site vandalization and looting, and thoroughly document extant and new sites in the Arkansas Ozarks. We highlight the value of using modern photogrammetric techniques in rock art documentation and monitoring and discuss one result of this ongoing research: a revised and updated rock art website for the state of Arkansas.

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

[106]

*Representation Matters: The Importance of Local Participation in Archaeological Projects in Belize*

Belize has and continues to be an important locus for the training of the next generation of archaeologists, hosting several international field schools annually. While Belizeans play a role in these projects, many simply fulfill the role of hired field/lab assistants. In recent years, Belizean students from Galen University (Belize) have taken an active role in working on projects to receive undergraduate field credits. The involvement of Belizeans at this level helps to increase the representation of Belizeans in the field of archaeology in Belize, contributing to undoing the prevalent stigma that archaeology in Belize is one of foreign pursuits. This paper examines the representation of Belizean students in the Belize Valley Archaeological Reconnaissance project to discuss how participation in a project changes their perceptions of cultural heritage and identity. In doing so, this paper will also highlight the successes and shortcomings of Belizean participation and representation in archaeological research in Belize.

Beardall, Antonio [243] see Batty, Sylvia

Beardall, Antonio [134] see Mink, Kirsten

**Beat, Alicia (US Forest Service—Colville National Forest)**

[143]

*Word Path: Connecting People to the Landscape and Traditional Indigenous Land Use through Language Preservation: A Collaborative Journey between the Kalispel Tribe of Indians and the Colville National Forest*

This presentation will discuss the Colville National Forest Heritage Program's collaboration with the Kalispel Tribe of Indians Language School on the reimagining of the Pioneer Park Heritage Interpretive Trail. The trail was constructed in the mid-1990s as mitigation for construction of a forest service dispersed campground on top of a Kalispel Winter Village. The trail incorporated the Salish language as it was understood at the time. The Kalispel Language School wanted to use the trail as an outdoor learning opportunity for its students. The forest and the school worked together on redesigning the trail to ensure a more meaningful experience for the students and visitors. This project has led to the CNF incorporating language preservation and indigenous land use in several other locations in Pend Oreille County and proposing additional bilingual trails in Ferry County in collaboration with the Colville Confederated Tribe.

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

[219]

*Chair*

**Bebber, Michelle (Kent State University) and Christopher Wolff (University at Albany)**

[219]

*Introduction to Session: Recent Research and Future Objectives*

The discovery and development of metals as tool media is a topic of global interest. Although this phenomenon is generally associated with sedentary, agrarian-based societies, in North America there is regularly documented, albeit not widely known, use of metals by hunter-gatherer populations as early as 9,000 years ago. Here, we bring together scholars from across the continent to share their research on this

fascinating topic. We first introduce the goals of this session, which aims to cover a diversity of Indigenous metal use, from procurement and practice to ideological and functional interpretive frameworks that place the use of metals into broader regional and interregional contexts. We then review our recent work, which uses a variety of methods—including experimental archaeology, cost/benefit analysis, and statistical modeling—to clarify the origin, duration, and decline of copper as tool medium. We conclude with future objectives aimed at advancing the broader study of hunter gatherer metal use.

Bebber, Michelle [219] see Eren, Metin  
 Bebbber, Michelle [219] see LavenderNees, Sarah  
 Bebbber, Michelle [219] see Samuels, Amanda  
 Bebbber, Michelle [219] see Wolff, Christopher

**Bebow-Reinhard, Monette (Historian/Researcher)**

**[228]**

*Copper Trade Network from Canada to South America*

Pre-contact copper manufacture and trade in the Americas is poorly understood. To remedy this, over the last decade I have compiled a master database of over 85,000 precontact copper artifacts recovered from across the Americas, with source materials from museums, online, and private collections. I present an overview of the precontact copper industry in the Americas, focusing on its cultural significance since the Archaic period, its geographic extent, and its persistence in the archaeological record. This database, along with the regional copper manuals I am currently producing using its data, are invaluable tools for archaeologists who work in the Americas and particularly in the Great Lakes region.

Beck, Charlotte [37] see Taylor, Amanda

**Beck, Jess (University College Dublin), Horia Ciugudean (Muzeul National al Unirii, Alba Iulia), Colin Quinn (Hamilton College) and Claes Uhnér (University of Oslo Museum of Cultural History)**

**[45]**

*Isotopic Analyses of Diet in Late Prehistoric Southwestern Transylvania*

Southwestern Transylvania houses a rich prehistoric archaeological record, as well as abundant natural resources, including salt, tin, and some of the richest copper and gold deposits in Europe. The Mureş River, which connected prehistoric communities in Eastern and Central Europe, also flows through the region. Despite its status as an economic and cultural crossroads, the biocultural backdrop of southwestern Transylvania has been understudied. This analysis presents the first major isotopic study of diet in southwestern Transylvania, including the results of over 60 analyses of carbon and nitrogen from human and faunal bone collagen; comparisons of whole diet and dietary protein are also made for a subsample of human individuals. The human samples encompass key contexts frequently used in archaeological comparisons, including the mountains and the lowlands, cemeteries and settlements, and the Early and Late Bronze Age. Our data show no statistically significant differences between human carbon and nitrogen values for the uplands and the lowlands. However, our results do reveal significant increases in human  $\delta^{13}\text{C}$  values over time when comparing the Early Bronze Age and Late Bronze–Early Iron Age, and well as significant differences in human  $\delta^{15}\text{N}$  values between individuals buried in cemeteries and individuals buried in settlements.

**Becker, Rory (EOU)**

**[47]**

*Chair*

**Becker, Rory (EOU), Ivor Jankovic (Institute for Anthropological Research, Zagreb), Darko Komšo (Archaeological Museum of Istria), Siniša Radovic (Croatian Academy of Sciences and Arts) and James Ahern (University of Wyoming)**

[47]

*Upper Paleolithic Movement and Trade as Represented at the Abri Kontija 002 Rockshelter Site*

The Abri Kontija 002 rockshelter and cave located in the Istria Peninsula of Croatia provides a wealth of archaeological material dating to the Upper Paleolithic. Excavations beginning in 2014 produced several thousand artifacts, some of which can be traced to distant sources. This paper presents recently identified evidence providing insights into movement or trade among Upper Paleolithic peoples living in and around the Po Valley. Additionally, research at the Abri Kontija 002 site in the areas of sediment DNA, geoarchaeology, geophysical prospecting, and 3D scanning further inform our understanding of local and regional patterns.

Becker, Rory [47] see Ahern, James

Becker, Rory [47] see Jankovic, Ivor

Becquelin, Pierre [93] see Michelet, Dominique

**Beekman, Christopher (University of Colorado, Denver)**

[58]

*Discussant*

**Beekman, Christopher (University of Colorado, Denver) and Migration Collective CfAS**

[217]

*Modeling a Collaborative Archaeological Synthesis of Human Migration for a Long-Term, Global Perspective*

Since September 2019, members of the Coalition for Archaeological Synthesis have sought to model a collaborative synthesis of human migration for a long-term, global perspective, from the earliest hominid movements to contemporary forced displacement in Europe. In March 2022, the group was hosted by the University Félix Houphouët-Boigny in Abidjan, Côte d'Ivoire, in which participants compared case studies drawn from around the world and through time with regional studies from West Africa to develop a methodological framework that connects examples from the past with contemporary migrations. The broader goal was to provide insight that can help West African nations face the impending dramatic increase in regional population movements due to shifts in climatic, environmental, and social conditions. The workshop participants included representatives from the United Nations High Commission on Refugees, the International Organization for Migration, and the Côte d'Ivoire Ministry of Justice and Human Rights. The attendees agreed to endorse the following four recommendations: (1) migration policies should prioritize cultural diversity, (2) policies should consider migration as a multigenerational process, (3) economic development plans should be designed to slow migration to concentrated urban areas, and (4) policies need to recognize the role of education as a key driver of migration.

**Beggen, Ian (University of Michigan)**

[68]

*Chair*

**Beggen, Ian (University of Michigan)**

[68]

*Preliminary Investigations of Mobile Forager Landscape Learning Processes in Central Western Patagonia, Chile*

Central Western Patagonia is an area characterized by climatic and landscape contrasts, with a variety of ecotones within a defined area. This region is naturally divided into different river valleys, separated by steep, ice-capped mountains. One such valley, the Ibáñez River Valley, has been investigated archaeologically since the early 1970s. The Ibáñez Valley, stretching around 80 km east-west, features dozens of sites dating from

the Early Holocene into the Terminal Holocene featuring residential occupations as well as rock art. However, even with this history of research and robust signature of human behavior, limited systematic archaeological survey has been conducted around the Río Ibáñez due to numerous factors (difficulty of terrain, research paradigms, etc.). In this paper, I show the results of preliminary research to synthesize findings from already-collected archaeological materials from the Río Ibáñez and new pedestrian survey from the southern extent of the valley. This preliminary research serves to reintegrate earlier findings from the Río Ibáñez with modern systematic survey, allowing for a more comprehensive understanding of landscape learning patterns of mobile hunter-gatherer groups that occupied the region since the Early Holocene.

**Begmatov, Alisher (ISAW, NYU), Tomoyuki Usami (Kyoto University of the Arts) and Husniddin Rahmonov (Samarkand Institute of Archaeology)**

[141]

*Excavations at Mingtepa, a Sogdian Town near Samarkand*

This paper presents the initial results of the excavations at Mingtepa, located ca. 20 km northeast of Samarkand, Uzbekistan. This site is presumed to be Kabudhan, a late antique and early medieval Sogdian town, attested in Chinese and Arabic sources. Mingtepa (Uzbek for “thousand hills”) covers an area of about 35 ha. On the northern side of the site, there is a distinctive double protective wall. The citadel (55–60 × 55–60 m) is located to the south of the site. It is surrounded on the north, east, and west by shahristan (inner city), and by a wall on the south side. Outside the walls of shahristan (especially to the east and west), the area of what is presumed to be rabad extends. A road running east-west divides the site into two halves. In 2021 and 2022, we launched two trenches in the shahristan area of the site. During these excavations, numerous artifacts, including pottery and terracotta fragments, were unearthed. These will be the main focus of this paper.

Bekker, Matthew [198] see Finley, Judson

**Belcher, Megan (Washington University, St. Louis) and Natalie Mueller (Washington University, St. Louis)**

[111]

*Cultivating Lost Crops: New Insights on the Domestication of Goosefoot (*Chenopodium berlandieri*) from a Common Garden Experiment*

In precolumbian eastern North America, archaeological evidence indicates that Indigenous peoples domesticated a unique crop system called the Eastern Agricultural Complex (EAC) before the arrival of maize (*Zea mays*) from what is now Mexico. The EAC is thought to have sustained past Indigenous people in eastern North America from around 3900 BP to approximately 600 BP. Their domesticated forms fell out of cultivation prior to European contact, and many important questions remain about the process of domesticating these plants as well as how they preserve in the archaeological record. This presentation focuses on one of these lost crops: goosefoot (*Chenopodium berlandieri*), an herbaceous annual that produces polymorphic seeds. We report our results from an experimental growth study of the wild modern progenitor of goosefoot. Our findings indicate that goosefoot produces higher percentages (30%–49%) of thin-testa morphs than previously reported (1%–5%), emphasizing this plant’s inherent developmental plasticity. We argue that the seed polymorphism plasticity seen in modern wild progenitors of goosefoot likely occurred in past wild goosefoot populations, complicating previous theories that goosefoot domestication was a linear process of a transition from “wild” or “weedy” thick-testa morphs to “cultigen” thin-testa morphs.

**Belcher, William (School of Global Integrative Studies)**

[1]

*Discussant*

Belfer-Cohen, Anna [212] see Hovers, Erella

**Bell, Ellen (California State University, Stanislaus), Erlend Johnson (Tulane University), Marcello Canuto (Tulane University) and Cassandra Bill (Langara College)**  
[93]

*Frayed at the Edges: Insights into Classic Period (250–900 CE) Maya Political Organization from the Southeast Maya Kingdom of Copan, Honduras*

While ongoing research has clarified much about the strategies Classic period (250–900 CE) Maya rulers used to establish, integrate, and administer their Lowland Maya kingdoms, studies of frontier zones, such as the southeast edge of the Maya area, both provide insights into Maya political organization and highlight local challenges not faced by rulers in the Maya heartland. We draw on this diversity and its implications to explore the internal organization, geographical limits, and multiethnic composition of Copan, Honduras. Investigations of regional centers, including settlements in the El Paraíso Valley, the Cucuyagua Valley, the Naco and Cacaupala valleys, and the La Entrada region, suggest that Copan rulers faced unique challenges that demanded a wide variety of fluid and shifting administrative strategies to integrate a vast and heterogeneous hinterland. These insights, and the diversity of administrative strategies documented within a single polity, productively inform similar investigations in the Maya Lowlands where boundaries are not as clearly marked and administrative practices appear more uniform. This study supports the growing body of evidence that Maya administrative strategies were more varied and contingent than previously thought.

**Bell, Ellen (California State University Stanislaus)**  
[158]

*Discussant*

**Bell, Makanani (University of Southampton)**  
[106]

*Evaluating Community Engagement*

Archaeologists hold tremendous power and voice through producing knowledge about people who came before. Our interpretations of the past affect societies today and future generations. Involving non-archaeologists in the research process, through community engagement, amplifies this potential. Heritage management and archaeology have long espoused the benefits of community engagement. However, on few occasions have we paused to evaluate our work in a rigorous manner and made the results available to others. When we do conduct evaluations, they are frequently for funders and not the communities involved, other stakeholders, or archaeologists. Without reflection and assessment, we limit ourselves as negative consequences potentially go unnoticed, and errors can be repeated. This presentation will present preliminary findings of my PhD research, which aims to build an effective evaluation tool for community archaeology with input from those who might use it: funders, practitioners, and community members. The goals of this evaluation tool are not to select the best or most successful community archaeology project nor to provide a one-size-fits-all framework. Instead, it is an adaptable tool designed to help projects assess themselves against their own objectives, highlight intended and unintended impacts to all stakeholders, and identify areas for improvement.

Bell, Matthew [207] see Tuggle, Myra Jean

**Beller, Jeremy (Simon Fraser University), Mark Collard (Simon Fraser University) and Amer al-Soulimann (University of Ferrara)**  
[21]

*The Late Acheulean of the Azraq Basin, Jordan, and Its Implications for Hominin Dispersals into the Levant*

The Azraq Basin is an important physiogeographic feature and hydrological catchment area in the eastern desert of Jordan. At its heart are the Azraq wetlands, an ecologically fragile oasis complex characterized by

the spring-fed historic Druze Marsh and rehabilitated Shishan Marsh. Archaeological investigation over the past 70 years has discovered multiple Late Acheulean sites in the basin, including butchering and knapping locales. Many sites are located around the wetlands due to the limited and fluctuating water availability. This paper explores the nature of Acheulean occupation within the Azraq Basin and its potential role in dispersal events into the Levant, with particular emphasis on cultural and geographic connections with the Arabian Peninsula. Recent research in the northwestern Arabian Peninsula has identified Late Acheulean occupation in the Nefud Desert. The consistencies between Acheulean lithic assemblages from the two regions may indicate population movement. Dispersing along paleohydrological corridors could have allowed hominins to securely move through the Nefud Desert and into the Azraq Basin during MIS 9–6.

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

[136]

Chair

[156]

Discussant

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

[136]

*Introduction to Symposium: Collaborative and Community Engaged Scholarship and Case Studies*

This presentation is an introduction to our ninth symposium on “Collaborative and Community Engaged Scholarship (CES)”—an important topic in our profession, encompassing a growing diversity of activities and best practices. Conducting research (and other types of historic preservation endeavors) in effective partnership with a wide spectrum of stakeholders just makes sense, is only fair, and contributes greatly to the final product. Community involvement and participation is a way not only to give a voice to groups that have been essentially voiceless but to empower all players—especially on projects that involve “multiple pasts.” Soliciting other views and asking for input is appropriate. More and more often there are real opportunities for community members (and I mean the whole community: indigenous, ancestral, recent residents, landowners, politicians, educators, etc.) to become involved in projects in really meaningful ways.

**Bello, Silvia (Natural History Museum) and Simon Parfitt (University College London)**

[214]

*Distinguishing Tooth Marks from Knapping Marks and Assessing Conflicting Interpretations of Modified Bones from the Upper Paleolithic Site of Gough’s Cave (Somerset, UK)*

Experimental and fossil-based zooarchaeological research attempts to distinguish traces on bones associated with human actions (e.g., butchery marks) from the actions of other faunal agents (e.g., bone gnawing and trampling). Fewer analyses have tried to differentiate gnawing marks from the marks left by hominin activities associated with the preparation and use of bones as tools. In this talk we will focus on knapping tools (bones, teeth, and antlers used to strike lithic material in the preparation of stone tools) and knapping marks, which are a particularly difficult category of bone surface alteration to distinguish from chewing marks. We applied multiple techniques of analysis (focus variation microscopy, CT scanning, SEM, and EDX) to compare alterations inflicted on bones used in knapping experiments with marks on bones chewed by medium-size carnivores. Diagnostic criteria associated with these different agents were used to inform our analysis of an Upper Paleolithic bone assemblage from Gough’s Cave (UK), resulting in the recognition that knapping tools had been misattributed to carnivore chewing in earlier taphonomic studies. These misidentifications have led to erroneous conclusions regarding human behavior at the site and the role of carnivores in accumulating and modifying the bone assemblages at Gough’s Cave.

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

[248]

Chair

**Bellorado, Benjamin (Crow Canyon Archaeological Center), Kelley Hays-Gilpin (Northern Arizona University) and Laurie Webster (University of Arizona)**  
**[248]**

*Fashions and Fabrications of the Fanciest Footwear: Two Millennia of Stability and Change in Twined Sandal Use in the US Southwest*

Twined sandals were the most long-lived yucca-cordage sandals used by Ancestral Pueblo people in the US Southwest, bridging the Basketmaker II (100 BC–AD 550) through Pueblo III (AD 1150–1300) periods. They were among the most technologically complex, ornate, and resource-intensive textiles ever produced in the region and also a key feature of Ancestral Pueblo dressed identities. Over the two millennia when they were produced, their woven structures, stylistic attributes, and uses changed, sometimes rapidly, sometimes slowly, suggesting that they functioned as both modish and fashionable expressions of hierarchy and community. Native American collaborators and cross-media studies suggest that these sandals served as ritual paraphernalia that simultaneously functioned as symbols of conservatism and progress. Unlike most types of clothing and other textiles made in the region, several thousand examples of these sandals have been recovered from archaeological contexts and are available for analysis. Based on recent studies and using a newly acquired dataset of 53 AMS dates, we outline this footwear's stylistic and technological stability and change and discuss how they served to signal social identities within and between groups, with particular focus on developments associated with the Basketmaker, Chaco, and post-Chaco eras across the Ancestral Pueblo world.

Bellorado, Benjamin [248] see Jolie, Edward

Bellorado, Benjamin [248] see Weahkee, Mary

Bellorado, Benjamin [90] see Windes, Thomas

**Belmaker, Miriam (University of Tulsa) and Omri Barzilai (Israel Antiquities Authority)**  
**[127]**

*Back to 'Ubeidiya: Renewed Excavations at an Early Pleistocene Site in the Levant*

'Ubeidiya, Central Jordan Valley, Israel, is one of the earliest prehistoric sites outside Africa. Extensive excavations in the second half of the twentieth century yielded important archaeological, paleontological, and geological data, which provided insights into early Pleistocene hominins' expansion out of Africa. The primary geological descriptions of the site were its four cycles: Limnic Inferior (Li), Fluvatile Inferior (Fi), Limnic Upper (Lu), and Fluvatile Upper (Fu). A composite stratigraphic column detailing the correlation on either side of the anticline summit has been extensively used as the model for within-site chronology. Here we present preliminary field observations from new excavations conducted in 2021 and 2022 at 'Ubeidiya. We could not securely identify a correlation between strata on both sides of the anticline summit and between trenches 1la and 1a, which formed the basis for the famous stratigraphic diagram, and could not confirm the published stratigraphic schema. Thus, a detailed revision is warranted. Outstanding questions, such as the presence of Oldowan in the Li cycle, may need to be reexamined to understand better the tempo and mode of the expansion of the early Pleistocene from Africa to Eurasia.

Belmaker, Miriam [109] see Kelley, Kathleen

Belmaker, Miriam [82] see Schumacher, Emily

**Belmiro, Joana (ICArEHB), Jovan Galfi (ICArEHB), Nuno Bicho (ICArEHB), Xavier Terradas (CSIC, ICArEHB) and João Cascalheira (ICArEHB)**  
**[47]**

*A Diachronic Perspective of Chert Provisioning and Use: The Middle and Upper Paleolithic of Southwesternmost Iberia*

Hunter-gatherers relied strongly on lithic raw materials, which make them a key aspect to understand mobility, land use, and other important cultural aspects. Identifying changes in raw material provisioning through time is key to understand how different groups adapted and reorganized their culture. This is especially true for the Late Pleistocene, during which abrupt climatic changes seem to have had a severe

impact on the adaptive systems of human populations. Territories like southwesternmost Iberia, that seemed to have functioned as long-term refugia for hunter-gatherer communities throughout this timeframe, are ideal scenarios for wide diachronic studies. This paper presents the results of chert raw material analysis (macroscopic and petrographic) from the MP cave site of Gruta da Companheira and the UP levels (Gravettian to Magdalenian) of the multicomponent (open-air and rockshelter) site of Vale Boi, both located near the Southwesternmost point of Iberia. Making use of a comprehensive lithotheque of regional comparative chert samples, our study allowed to study the provisioning strategies and use of chert of the Late Pleistocene from a diachronic perspective, and to better understand hunter-gatherer mobility, economical, and technological organization through time in this region.

Belmiro, Joana [239] see Cascalheira, João

Beltran, Boris [125] see Griffin, Robert

Beltran-Caballero, Jose Alejandro [61] see Matos, Ramiro

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

[79]

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

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

**Benedetti, Michael (University of North Carolina, Wilmington), Jonathan Haws (University of Louisville) and Lukas Friedl (University of West Bohemia)**

[121]

*Site Formation and Karst Processes during the Last Glacial Cycle at Lapa Do Picareiro, Portugal*

The Paleolithic cave site of Lapa do Picareiro is located on the upper slopes of the Serra de Aire limestone massif (571 m asl) about 100 km northeast of Lisbon, Portugal. The cave is a single chamber (15 × 15 m) with >10 m of sedimentary fill, mostly limestone éboulis clasts and muddy sediment in pore spaces. During the last glacial stage, the cave underwent a cycle of karst enlargement, speleogenesis, roof retreat, and deposition, resulting in a sedimentary sequence that dates 9–80 ka BP. The cave was occupied frequently, containing abundant archaeological and faunal evidence from the Middle Paleolithic, Upper Paleolithic, Neolithic and Bronze Age. Sedimentation rates stayed relatively constant throughout the glacial stage, while occupation intensity varied. The Middle Paleolithic levels reflect occasional use of the cave during a time when speleothems were forming, the cave was wet and perhaps less accessible from the surface. The Upper Paleolithic levels reflect more frequent human occupations alternating with dense faunal accumulations, at a time when the climate was mostly cold but the cave was more open to the surface. Karst processes and occupation dynamics were both influenced in part by Pleistocene climate events including Greenland stadials/interstadials and Heinrich events.

Benedetti, Michael [47] see Carvalho, Milena

**Bennett, Matthew, Sally Reynolds (Bournemouth University) and Sarah Maryon (Bournemouth University)****[248]***The Ichnological Record of Footwear: Some Thoughts and Experiments*

Human footprints have been found throughout the world. At White Sands (New Mexico) they hint at early human presence in the Americas, and during the summer of 2022 a new footprint site was reported from Utah. These sites are linked by their geological setting, dried lake beds and ancient playas, a common feature of the Americas. One question often asked is, Do any of these footprints show evidence of footwear? So far, the answer is no, although one tentative example was excavated in January 2022 at White Sands. The key to this is prospection but also data on what a shod footprint might look like. A moccasin, for example, might just soften the outline of a track and if the leather was smooth leave no trace but reduced anatomical definition. A beautiful sandal like those of Fort Rock might leave a clear pattern, and a one woven from yuccas another type of signature. We report a series of experiments with different types of Indigenous footwear. One of the key observations is that the track signature depends on the substrate properties as much as the footwear itself, and they may not be as easy to spot as one might think.

Bennett, Rhianna [105] see Krupa, Krystiana

Benoit, Emery [181] see Moriarty, Ellen

**Benoit, Taylor, Guillermo de Anda and James Brady****[81]***Cenote Xbis: The House of Rain*

The Gran Acuífero Maya discovered an important archaeological feature constructed within a cenote in Hochtún, Yucatán, Mexico. Cenote Xbis contains a well-built sacbe 3.5 m wide and more than 60 m long that leads to a large pool of water at the back of the cave. Two speleothem columns appear to have been significant in the layout of the sacbe, which curves around the first and terminates at the second. The final segment of the roadway allows passage to the second column without entering the water. Thousands of broken and smoke-blackened stalactites are attached to the ceiling. The many active formations show regrowth indicating that the breakage is not recent. The sound of dripping water from the stalactites creates the impression of rain. A platform and a rock art panel were also noted.

Bense, Judith [216] see Otis Charlton, Cynthia

Benson, Wyatt [214] see Burke, Chrissina

**Bentley, Nicholas (Texas A&M University)****[197]***Searching for Late Pleistocene Deposits: Recent Geoarchaeological Investigations of the Aucilla River, Florida*

Within the mid-channel sinkholes of the modern Aucilla River in northwest Florida, dozens of late Pleistocene archaeological sites lie inundated in both surficial and buried contexts. Despite four decades of dedicated research, however, only three of these sites have been securely dated with geoarchaeological field methods, including the 14,550-year-old Page-Ladson site. If we are to learn more about the earliest Americans, places that have the potential of containing late Pleistocene deposits, like the Aucilla River, need to be systematically investigated. This poster presents preliminary results of recent deposit-centered investigations within the lower Aucilla River. Through a combination of remote-sensing and geologic testing using percussion coring, probable late Pleistocene sediments and soils have been mapped and sampled.

Located near these deposits are ex situ ivory and chert artifacts, as well as the osseous remains of Pleistocene megafauna, findings hinting that the sites identified through these deposit-centered geoarchaeological investigations have the potential to contain in situ late Pleistocene archaeological sites. The methodology presented here provides a framework for future systematic and targeted investigations of late Pleistocene deposits and archaeological sites.

**Benz, Bruce (Texas Wesleyan University)**

[20]

*Was Setaria Domesticated in Tehuacan?*

Excavation of Coxcatlan cave recovered remains of *Setaria cf. macrostachya*. Analysis suggested early increase in abundance of florets (so-called seeds) in deposits associated with El Riego Phase contexts and later decrease in Coxcatlan Phase deposits. Callen observed a size increase of *Setaria* florets recovered from reconstituted human coprolites and attributed it to domestication. El Riego and Coxcatlan Phase collections of *Setaria* were AMS dated and the florets' size analyzed. Chronometric determinations of florets examined indicate the Phase associations described by Smith, Callen, and MacNeish to be accurate. Morphometric characterization suggests seed size increase from early to later deposits. Evolutionary rate determinations fall within the range of evolving natural populations suggesting that directional selection, while intuitively suggestive and pleasing, is probably great enough to suggest preferential collection but not domestication.

Benz, Bruce [20] see Vallebueno-Estrada, Miguel

Bergin, Sean [150] see Snitker, Grant

**Bergmann, Christine (University of South Florida) and Alexis Rodriguez Yabar (Universidad Nacional Mayor de San Marcos)**

[22]

*From Pozuelo to Paracas: An Approach to the Processes of Formation and Social Complexity in Early Societies in the Chíncha Valley*

Paracas, believed to be the oldest complex society on the southern coast of Peru, occupied the Chíncha Valley during part of the Formative period (400–200 BCE). Although there is evidence of the Paracas occupation throughout the Chíncha Valley, little is known about the formation of Paracas within the valley. Relatively recent investigations, led by the Programa Arqueológico Chíncha, have revealed the presence of an occupation in the valley which existed prior to Paracas, called Pozuelo; the Pozuelo occupation (800–500 BCE) possessed one of the earliest known archaeological mound complexes on the south coast of Peru. This research uses geoarchaeological and paleoenvironmental evidence to elucidate the strategies and transformation processes involved in the development of Paracas in the valley. Additionally, from a multidisciplinary approach, we will attempt to provide an explanation of the long historical process of the complex formations in the Chíncha Valley.

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

[228]

*Royal Numismatic Hoard from Samshvilde (Political and Economic Aspect of the Medieval South Caucasus based on Archaeological Data)*

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 valleys. This distinctive landscape, combined with environmental conditions and abundant natural resources, have attracted people for millennia, but the “Golden Era” of Samshvilde City was in the eleventh–twelfth centuries when it became a Royal Center of the whole Region. It is noteworthy that the Numismatic Hoard of Medieval Coins of “Royal period” was discovered by the team of archaeologist inside the main fortification walls of the City.

The hoard combines a unique collection of Georgian and Oriental coins, which were circulating in the whole region in the eleventh–twelfth centuries and represented a unique value for the whole Near East. The silver and copper coins of the four Georgian Monarchs are represented here, bearing the inscriptions in three (Georgian, Arabian, Greek) languages, that helps to understand economic, political, and cultural importance of medieval South Caucasus, as the main crossroad on the “Silk Road” for West and the East.

**Berikashvili, Otar**

[148]

*New Archaeological Data from “Ortvala Cave” (Multilayer Cave Complex from Georgia, South Caucasus)*

“Ortvala Cave” (Double Eye) is located in the southern part of Georgia (South Caucasus), a distance of 98 km from present day Georgian-Armenian border, and represents a multilayer cave complex, combining deposits of Mousterian culture (Lower Paleolithic), as well as the deposits of Chalcolithic, Early Bronze, and medieval periods. Archaeological and interdisciplinary studies of “Ortvala Cave” started in 2018 by the International Archaeological Center of the University of Georgia (Tbilisi). Since then, stone chopping tools, levallois flakes, and bone drill tools of Mousterian culture were discovered in the lowest archaeological contexts. Archaeological excavation in 2019–2021 revealed pottery fragments and bone artifacts that are of later periods and belong to the Early Agriculturers and Early Bronze period (Kura-Araks Culture) communities. The presentation of the archaeological materials, data, and the results from “Ortvala Cave” will help to bring the recently studied cave complex to the archaeological society and to share the ideas for future discussions and perspectives.

Berini, John [175] see Briggs, Emily

Berke, Melissa [235] see Golitko, Mark

Berlin, Andrea [216] see Michelaki, Kostalena

Berman, Marc [24] see Hanks, Bryan

**Bernardini, Wesley (University of Redlands) and Leigh Kuwanwisiwma (Hopi Tribe)**

[90]

*Place of the Songs: Hopi Connections to the Mesa Verde Region*

Hopi connections to the Mesa Verde region have been noted by anthropologists and archaeologists for more than a century. Mesa Verde is not explicitly mentioned by name in some of the older, commonly cited collections of Hopi clan migration traditions, but contemporary Hopi people are unambiguous about the strong relationship between Hopi and the Mesa Verde region. In this paper we present an interview with Leigh Kuwanwisiwma, a Greasewood Clan member from the village of Paaqavi on Third Mesa, which details the specific connections of Hopi clans and ceremonies to the Mesa Verde region.

Berryman, Judy [230] see Walker, William

**Berube, Eloi (McMaster University) and Cira Martínez López (INAH Oaxaca)**

[91]

*Connecting Dead, Living, and Supernatural through Plants: Botanical Mortuary Offerings at Monte Albán*

This paper examines the plants used as mortuary offerings at the Zapotec city of Monte Albán (500 BCE–900

CE). After their passing, the deceased became Ancestors able to offer protection to their descendants. I explore the possibility that food (specifically plants) might have helped to provide and strengthen a bridge between the living and the deceased. To determine the presence of plants used as mortuary offerings, I examined starch grains and phytoliths recovered from artifacts and sediment samples collected during the PEMA project (1992–1994). In this paper, I compare the use of plants placed in formal tombs to those deposited in simple graves. People buried in tombs are understood to be leaders of households, while people interred in graves were of a lesser social status. In addition to examining if there was a differential access to resources used as offerings based on the social standing of the deceased, I also compare the use of plants in mortuary contexts throughout the occupation of the site. This way, I examine the strong connection between the use of plants as mortuary offerings and the larger social, economic, religious, and political phenomena affecting the daily lives of the inhabitants of Monte Albán.

**Besaw, Courtney**

[72]

*Small-Scale Agriculture and Localized Food Processing: Overview of a Post-Emancipation Communal Sugar (and Mango) Processing Platform on Providencia Island, Colombia*

Sugar production was integral to European colonization during the sixteenth and seventeenth centuries, but the archaeology of sugar has almost exclusively focused on industrial-level, surplus, and profit centered production at large plantations. This has resulted in a lack of data related to small-scale productive activities centered on localized sales and consumption. Sugar cane and other crops, such as mango, were and continue to be processed at varying scales for both personal use and limited commercial sale. This project documents what was likely a communal use platform utilized for processing sugar cane and mango—a deeply historical practice, which continues to this day on the Island—dating to the mid- to late nineteenth century and possibly earlier as there are multiple, hard-packed activity floors that suggest this space was actively used and maintained for a long period of time. Attached to the platform are what may be the remains of small cooling channels used to process boiled cane juice. Community archaeology and ethnographic approaches both informed the excavation of this site and support the current archaeological interpretation of the feature, which will be further explored during upcoming field research seasons on Providencia.

Bessemer-Clark, Boel [92] see Montenegro, Alvaro

**Best, Kaleigh, Jessi Spencer (Southern Illinois University, Carbondale) and Mark Wagner (Southern Illinois University, Carbondale)**

[162]

*Resting in Meaning: Symbolism from St. Henry's Cemetery (11S1742), East St. Louis, IL, 1866–1908*

St. Henry's Catholic Cemetery (11S1742), located in East St. Louis, IL, was in use between 1866 and 1908 and mainly served the surrounding German and Irish communities. Despite repeated claims of full relocation since its closure, the presence of burials on site has been debated. However, recent excavations reveal a likely large number of burials were abandoned and persist today. During Phase III excavations, biological data, incidental, mortuary, and cultural artifacts were analyzed from 32 burials exhumed between November 2021 and February 2022. St. Henry's Cemetery was active during the Victorian Beautification of Death movement, where mortuary symbolism was deliberate and meaningful. Examining the affiliated funerary objects from the 32 excavated burials, different motifs expressed throughout mortuary and cultural artifacts are explored. A variety of catholic iconography is represented by different floral, plant, bird, cross, geometric design, crown, anchor, flame, scroll, etc., motifs. These motifs will be used to better understand the possible meanings they inspire, how they may relate to the decedent and their families, and possibly show how they wanted to be represented in both life and the afterlife.

Best, Kaleigh [82] see Spencer, Jessi

**Betenson, Britt (Bureau of Land Management, OR/WA, Northwest Oregon District)****[194]***Discussant*

Bethard, Jonathan [102] see Maisel, Mary

**Bethke, Brandi (University of Oklahoma), Sarah Trabert (University of Oklahoma) and Gary McAdams (Wichita and Affiliated Tribes)****[169]***Remembering ichaskhah (Camp Creek): Low-Impact Methodologies for Documenting an Early Twentieth-Century Wichita Camp and Dance Ground in Oklahoma*

The Wichita and Affiliated Tribes have a long history of occupation in Oklahoma. This includes evidence of both pre- and postcontact habitations along major and minor waterways near Anadarko, Oklahoma. Here Wichita peoples camped, built grass houses and arbors, and held social gatherings in these spaces leading up to and following the passing of the General Allotment Act (or Dawes Act) in 1887. After allotment, communal camp and dance grounds were especially important focal points for community building. These Allotment period sites are critical to understanding the multigenerational connections between ancestral and contemporary Wichita peoples. This history is also important to the community today. However, few archaeological sites from the Allotment period have been documented. This paper presents a collaborative, low-impact methodology for identifying and recording the ichaskhah (Camp Creek) site that was used from the 1930s until 1963 as a center of Wichita social life.

**Betsinger, Michael (University of Maryland, College Park)****[57]***“On the Road to Moorhead”: Contextualizing the Infrastructure of Transient Workers and Moorhead Saloons along the Minnesota and North Dakota Border*

Following the Civil War, the Midwest experienced unprecedented population growth. Keeping pace with the expansion of numerous commodity frontiers driven by the building of railways, cities such as Fargo, ND, and Moorhead, MN, became seasonal locales for thousands of transient workers seeking employment. While these workers were employed in a variety of industries, many came to the region in hopes of working in the wheat fields either on small farms or the industrial “bonanza farms.” Simultaneously, saloons expanded greatly in Moorhead, taking advantage of the influx of seasonal laborers and statewide prohibition in North Dakota. Archaeological investigations at the Saloon Row site in Moorhead revealed an incredibly rich material culture, emblematic of various drinking behaviors occurring in and around the North Bridge, one of the few bridges that once connected Fargo and Moorhead. Considered as part of a wider system of transportation networks and businesses, the Saloon Row site sits at the center of overlapping infrastructure. Combining the insights gained from analyzing liquor flasks as well as historical documentation, this paper seeks to highlight the experiences of transient workers as they transgressed an increasingly complex and often violent environment during the late nineteenth and early twentieth centuries.

**Bettinger, Robert (University of California, Davis)****[53]***Discussant***Bey, George (Millsaps College), William Ringle (Davidson College) and Tomas Gallareta N.****[93]***Statecraft, Politics, and Kingship in the Northern Maya Lowlands, with a Focus on the Puuc Region*

This paper examines the nature of northern Maya lowland statecraft, politics, and kingship and how they

differ and parallel that of the southern lowlands. In keeping with the goal of the symposium this paper focuses on the concept of “regime” recognizing the Maya, especially when considering the northern and southern areas, created distinct political organizations. The northern Maya lowlands regimes evolved differently from their southern cousins in language, literacy, elite material culture, royal authority, and political structure. This paper gives special attention to the long history of the Maya in the Puuc region, considering the development of the Puuc Maya regime and those of the larger northern Maya lowlands through the organizers’ lens of “citizenry” (social practices resulting in a shared political identity). Puuc “citizenry” is defined and interpreted by the use of archaeological site data as well as lidar data, focusing on regional questions of settlement. The regime is not based on a single site or a single line of evidence. We think this provides a more accurate understanding of what went on regarding the evolution of a northern regime and how it can be understood in terms of Maya citizens in other regimes.

Beyer, Kelby [210] see Carter, Alison

Bhattacharya, Tripti [54] see Krause, Samantha

**Bhattacharyya, Tiyas (University of Oregon)**

[128]

*Chair*

**Bhattacharyya, Tiyas (University of Oregon)**

[128]

*An Examination of the Multiple Roles of Wild and Domestic Animals Excavated from the Vat Komnou Cemetery (200 BCE–400 CE) at Angkor Borei, Cambodia*

This talk will discuss the preliminary results of a pilot study focusing on faunal remains from the Early Historic/Pre-Angkorian site of Angkor Borei, Cambodia. Angkor Borei is one of Southeast Asia’s earliest urban centers, located in the Mekong Delta region of southern Cambodia. It was also a prominent trading center from the late first millennium BCE to the first millennium CE. I will present select zooarchaeological remains from burial contexts, excavated as part of the Lower Mekong Archaeological Project (LOMAP), from the Vat Komnou cemetery (200 BCE–400 CE). Initial identification by previous scholars found both wild and domesticated fauna along with all major local taxa. By examining the types and proportions of animals found in this cemetery and comparing this dataset to select zooarchaeological remains from other non-mortuary contexts at Angkor Borei, I examine the potential social roles of these animals, alongside their significance to subsistence, secondary product usage, and labor. Furthermore, I will discuss proposed shifts in human-animal-environment interactions, and how these may coincide with diachronic changes in sociopolitical organization, the subsistence economy, and religious practices.

**Bicho, Nuno (Universidade do Algarve), João Cascalheira (ICArEHB, Universidade do Algarve), Jonathan Haws (University of Louisville) and Matthieu Honegger (Université du Neuchâtel)**

[212]

*MSA Technology in Kerma, Sudan: The Development of Fieldwork Methods for Data Acquisition in Basalt Outcrop Settings*

One of the primary centers for understanding Anatomically Modern Human dispersal is the Nile Valley. In this paper, we present preliminary results from a survey and MSA lithic collection during a second field season to take place in the Kerma region, northern Sudan, during January 2023. The lithic assemblages are mostly basalt, a major raw material in the area due to the presence of outcrops, that cut through the local Nubian sandstone bedrock. While many of these outcrops are small extrusions spread on the landscape, there is at least one major basalt plug, some 150 m high and over 600 m in diameter. On top of this landscape feature, there are various loci where the basalt was exploited, and in each there are thousands of MSA artifacts. This paper will present the methodological strategies for collecting data at each of these loci.

Bicho, Nuno [47] see Belmiro, Joana

**Biehl, Peter (University of California, Santa Cruz)**

[39]

*Discussant*

**Biehl, Peter (University of California, Santa Cruz) and Johannes Mueller (Kiel University)**

[14]

*Climate Change and Archaeology*

This contribution will discuss the relationship between climate change research in archaeology and its application in the heritage management sector, museums, education, and policies. We will do so within a global framework of past climate change action in intergovernmental panels, agencies, and associations as well as in research funding for current interdisciplinary research projects on impacts of climate change and the responses of societies in the past and present. We will discuss ways to translate fundamental archaeological research into actionable science to inform decision-making as well as monitor climate change as it relates to cultural heritage. We will also argue that archaeology is well placed to enhance the socioecological resilience of societies and their adaptive capacity to climate change through the study of past pathways to adaptation. We will present the “Kiel Statement” (<https://www.jma.uni-kiel.de/en/research-projects/sacc/sacc-statement-2021.pdf>)—which is endorsed by organizations such as the European Association of Archaeologists (EAA), ICOMOS, the SAA, and the World Archaeological Congress (WAC)—and discuss next steps for developing recommendations for climate change action in archaeology and processes for their implementation for WAC10.

**Biggs, Harley, Steven Hackenberger (Central Washington University) and Karisa Terry (Central Washington University)**

[27]

*Interpreting Lesser Antillean Island Domestic and Ritual Practices through Household and Ceramic Analysis at the Goddard Site, Barbados*

Biggs analyzed data collected by Hackenberger and others in 1986 during an archaeological rescue on the Goddard Site, Barbados, West Indies. For this study, students redeveloped ceramic and shell spatial datasets, compiled site maps, and rendered new computer maps of house features and artifact distributions. The semi-circular house (with hearths and postholes) is approximately 14 m in diameter. A burial feature in the house, containing a young adult woman and related artifacts, was also reexamined. We measured and classified 360 pottery rims associated with the Troumassoid assemblage. Samples of ceramics, bone, and charcoal are radiocarbon dated. These results add to the anthropological understanding of both domestic and ritual practices 1,000 years ago.

Bill, Cassandra [93] see Bell, Ellen

**Billings, Traci**

[141]

*Investigating the Dietary Economy of Ancient Margiana: Ongoing Archaeobotanical Research at Togolok I (2300–1700 BC)*

Archaeobotanical research in Central Asia has expanded greatly in the last two decades, changing much about our understanding of past subsistence strategies and lifeways throughout the broader region. Archaeobotany is a crucial tool for gaining insight into the way that human/plant relationships shape and structure society. The mid-third to second millennium BC is a time of increasing interconnectivity in southern Central Asia. We see the buildup of cities and increased exchange between adjacent regions. Yet, despite the growing interest in archaeobotanical methods, we still know very little about the paleoeconomy in the area during this

dynamic time. Here we present recent archaeobotanical research from Togolok I, one of only a handful of sites in Turkmenistan to have been systematically examined for macrobotanical remains. Togolok I is an urban settlement located on the Murghab Alluvial Fan. Its macrobotanical assemblage revealed a rich collection of domesticated grains, legumes, and fruits, as well as several wild plant species. These findings, when considered with the zooarchaeological evidence, suggests that the inhabitants of Togolok I took part in a mixed agropastoral economy. This presentation will also contextualize the archaeobotanical findings at Togolok within the Murghab (ancient Margiana) and wider prehistoric Central Asia.

**Billman, Brian (UNC Chapel Hill)**

[164]

*Discussant*

[213]

*Chair*

**Billman, Brian (UNC Chapel Hill)**

[213]

*War and Peace and the Origins of Political Control in the Central Andean Coast: 3000 BC–AD 600*

The central Andes has a long history of the rise and fall of centralized political organizations, beginning with construction of the first large-scale ceremonial centers in the New World between 3000 and 1800 BC. Some see these early centers as pilgrimage centers, lacking significant political power, while others argue they were urban capitals of the first states in the New World. Likewise, the nature of armed conflict is point of significant debate with some researchers proposing a long period of peaceful social interaction. Drawing on case studies from the Moche and Casma Valleys and the Norte Chico, this paper presents an analysis of the structure of early polities and the role that warfare played in the development of those polities. Analysis of settlement pattern data and excavations at early centers indicates there was considerable variation in the degree of political control at centers. Further, key material correlates of armed conflict, such as fortification and shifts in settlement to defensible settings, are absent until after 500 BC. Although these data are consistent with an absence of armed conflict, we cannot yet exclude the possibility that warfare might have played a role in the formation of early polities in the central Andes.

Billman, Brian [69] see Mullins, Patrick

**Binning, Jeanne (California Department of Transportation), Jennifer Thatcher (Williamette Analytics Inc.) and Craig Skinner (formerly of the Northwest Research Obsidian Studies)**

[171]

*Using Technologically Diagnostic Debitage to Better Determine the Integrity of an Archaeological Site*

For a cultural resource to be eligible for the National Register of Historic Places, it must meet specific criteria. For significant archaeological sites, this usually means the resources can produce data that address important questions about the past (i.e., National Register Criterion D). The integrity of design is of vital importance when considering eligibility via Criterion D. In this context, design refers to the relationships or patterning of artifacts, ecofacts, and features. Frequency, bioturbation, cultural transformations, and other postdepositional forces are assumed to have destroyed the integrity of an archaeological site, resulting in the site being determined ineligible to the National Register of Historic Places via Criterion D. This paper reports on the use of technologically diagnostic debitage, in conjunction with obsidian hydration dating, to better determine the integrity of an archaeological site and its potential to answer important questions about the past.

**Birch, Jennifer (University of Georgia)**

[24]

*Chair*

**Birch, Jennifer (University of Georgia) and Ben Raffield (Uppsala University)****[24]**

*Why Are We Thinking “Beyond Barbarians”? Interrogating Dimensions of Military Organization in Non-State Societies*

There are good reasons to problematize and theorize dimensions of military organization. Despite the wellspring of research on the archaeology of warfare over the last 30 years, conceptual gaps remain. Warfare among small-scale societies remains typified as total war, while the study of state-sponsored warfare typically focuses on the role of military specialists in achieving elite political and economic agendas. And yet, many of the societies that have traditionally been regarded as “warlike” in the archaeological imagination fall into an ill-defined middle range that lies between these two extremes. Iroquois war parties, Viking Age raiders, Mongol khanates, and Visigothic hordes do not fit neatly into social evolutionary boxes and as such elude analyses devoted to questions of complexity. Understanding the organizational structure of militarized groups is especially important when we consider that they comprised hundreds to thousands of individuals who achieved strategic objectives despite operating away from home for extended periods of time and the absence of rigid hierarchy. In this introductory paper, we outline the prospective benefits of developing a body of comparative scholarship that will permit inferences about relationships between political and military organization in societies that operated beyond the boundaries of premodern states.

Birch, Jennifer [142] see Steere, Benjamin

Birch, Jennifer [24] see Williamson, Ronald

Bird, Broxton [45] see Polk, Sara

Bird, Douglas [97] see Winterhalder, Bruce

**Birge, Adam (University of Texas, San Antonio)****[16]**

*Ghosts and Cyborgs of Landscape Pasts, Presents, and Futures: A Case Study from Sajama, Bolivia*

Landscapes are haunted, cyborg stories. They are haunted by pasts that could have been and emergent futures. They are cyborgs as they are assemblages of human and nonhuman entities in emplaced relationships. They are stories because we curate and present a version of a landscape where certain places, voices, and agents are more important. This is the case for the Sajama landscape in highland Bolivia. The ghosts of the local Carangas, Inca, and Spanish pasts continue to emerge. At the center of Huaylilla, Inka and Carangas client relationships are reflected in residential architecture and portable goods. Spanish churches remain emplaced within communities and their abandonment indicates changing relationships. The dynamic nature of landscapes is best marked by the Sajama lines, a system of linear geoglyphs over 15,000 km long. These places show assemblages of typical archaeological actors: humans, memory, living mountains, ancestors, prestige goods, and utilitarian wares. However, the story of the Sajama landscape is informed by contemporary practices of tourism, Indigenous movements, President Obama, alien conspiracies, and to a small extent Corona beer. A relational, assemblage approach is taken in examining the dynamic Sajama landscape. Preliminary dissertation data is presented from pedestrian surveys, site collections, and drone mapping.

Birkmann, Joseph [41] see Huckell, Bruce

**Bischoff, Robert (Arizona State University) and Cecilia Padilla-Iglesias (University of Zurich)****[95]**

*ArchMatNet: An Agent-Based Model to Investigate the Validity of Social Networks in Archaeology*

Archaeological network studies use characterizations of many kinds and aspects of material culture (e.g., sourcing, style, technology) as proxies for social relations. Yet, it is often unclear what types of interactions

are indicated by material culture. Social network analysis is a useful tool because it provides a set of methods and theoretical expectations linking network structures and positions to different kinds of outcomes for actors within a network. However, it is difficult to document direct social relationships in archaeology, and thus it is a substantial challenge to validate many network interpretations. This study uses the ArchMatNet agent-based model to demonstrate how material culture networks can relate to social networks. The model generates interactions (e.g., visiting and learning) between agents at multiple social scales, and where objects are created, traded, and discarded. The results demonstrate a positive relationship between material culture networks and social interaction networks, provided certain conditions are met.

Bischoff, Robert [95] see Hruschka, Daniel  
Bischoff, Robert [73] see Peeples, Matt

Bishop, Anna [236] see Marroquín, Alma

**Bishop, Katelyn (University of Illinois, Urbana-Champaign), Samantha Fladd (University of Colorado, Boulder) and Sarah Kurnick (University of Colorado, Boulder)**

[131]

*Who Makes the List: An Examination of Inclusion and Representation in the Society for American Archaeology's Annual Meetings*

A recent paper by Mary Leighton problematizes the culture of archaeological practice and the emphasis on embodying aspects of “performative informality.” Social relationships among archaeologists are attributed to assessments of merit rather than the friendships they often represent, and these relationships influence opportunities and assessments of others’ worth in the field. In this paper, we examine gender representation through the lens of participation in the annual meeting of the Society for American Archaeology (SAA). By examining archived SAA programs, we analyze differences in gender representation across conference “roles” (presenter, chair, moderator, discussant), as well as participation in different “session formats” (general session, invited symposium, poster session, etc.). Are archaeologists with certain identities more likely to coauthor papers/posters with each other? Are women invited to sessions at an appropriate rate given representation in the discipline as a whole? Does the gender of the session chair(s) impact the representation in the session as a whole? And, what can we do to promote more equitable practices?

Bishop, Katelyn [131] see Fladd, Samantha

Bishop, Ronald [238] see Reents-Budet, Dorie

**Biwer, Matthew (Dickinson College) and Heidi Hepburn (Dickinson College)**

[112]

*Paleoethnobotanical Analysis at Huaca del Loro: Initial Findings and Interpretations*

Archaeobotanical data have the ability to speak to myriad issues of human-environment interactions as well as social institutions within societies. Here, I present the initial findings from my analysis of paleoethnobotanical remains at the site of Huaca del Loro, a Wari-affiliated site located in the Nazca region of coastal Peru. I will focus my presentation on the suite of macrobotanical remains recovered during the 2022 excavations to interpret broader social and environmental interactions that took place during the occupation of the site. I then place these patterns within broader regional and temporal context. The identified plant remains speak to the importance of agriculture and the cultivation of food and medicinal plants of the region to Wari-affiliated residents. Furthermore, there is ample evidence for the continuation of markedly local environmental management strategies of the Nazca region in the face of Wari incursion. The continued importance of key native species at the site speaks to the relationship between Wari and local peoples and the importance of the environment in colonial entanglements.

Bjerger, Arnaq [173] see Madsen, Christian

Bjerger, Else [173] see Nielsen, Michael

**Bjørn, Rasmus (Max Planck Institute for the Science of Human History)  
[244]**

*Bronze Age Transitions in Their Own Words: Central Asian Interfaces*

Loanword analysis is a unique contribution of historical linguistics to our understanding of prehistoric cultural interfaces. As language reflects the lives of its speakers, the substantiation of loanwords draws on the composite evidence from linguistic as well as archaeology and genetics through triangulation. The Bronze Age of Central Asia is in principle linguistically mute, but a host of recent independent observations that tie languages, cultures, and genetics together in various ways invites a comprehensive reassessment of diagnostic loanwords that are associated with the Bronze Age and shared between Indo-European, Uralic, and Turkic, and sometimes reaching Old Chinese, Yukaghir, and other East Asian languages. The successful identification of the interfaces for loanwords can help settle long-standing debates on languages, migrations, and the items themselves. With reference to the archaeological record, I argue that at least six distinct cultural phenomena (including trade, metallurgy, horses, honey, and new social structures) can be dated to have entered Central and East Asian speech communities from immigrant Indo-European languages spoken in the Afanasievo and Andronovo cultures.

**Black, Geena and Jacob Freeman (Utah State University)  
[198]**

*Population, Sex, and Diet*

This poster presents comparative data on human bone chemistry to infer sex differences in prehistoric diets. We collected a global sample of human bone isotope data. Next, we joined these data with the global radiocarbon dataset developed by the People 3000 Research Network, as well as paleoclimate models and data. Finally, we analyzed the data focusing on issues related to population and sex. Specifically, we test the hypothesis that sex differences in diet are strongest during periods of high population pressure for resources and that females bear a disproportionate vulnerability during periods of population pressure via decreases in protein consumption. We discuss the importance of our results for understanding the socioecology of subsistence change.

**Black, Stephen (Texas State University, San Marcos)  
[130]**

*Carbohydrate Revolution Conceived: Alston Thoms's Legacy*

The North American Carbohydrate Revolution was conceived by a prolific researcher who spent decades in the Pacific Northwest, Northern Rockies, and South-Central North America exploring the data potential represented by the ubiquitous, highly visible, and often ignored evidence of hot rock cooking: fire-cracked rocks and much more. The late Alston V. Thoms first wrote about what he termed a “carbohydrate revolution” in 2008 to “call attention to an unprecedented, punctuated onset and subsequent intensification of the exploitation of plant foods. Especially . . . inulin-rich root foods that require prolonged cooking with the aid of hot-rock heating elements.” Throughout most of his career Thoms studied earth ovens and related cooking facilities, the subject of his ground-breaking 1989 dissertation and dozens of subsequent publications and presentations. To cite one relevant example, Thoms and his ecological archaeology team at Texas A&M documented 20 cultural layers spanning 10,000 years within 14 m of stratified deposits at the Richard Beene site off the Medina River near San Antonio, Texas. Earth ovens used primarily for baking plants were documented in virtually all layers, a very impressive case in point of the Carbohydrate Revolution showing this continental land-use intensification was well underway in earliest Holocene times.

**Black, Valda (Washington State University) and Danielle Kurin (Sondor Bioarchaeology Project)**

[10]

*Bioarchaeology of Imperial Relations: Chanka and Inca Interactions at Sondor*

An empire expanding into a previously established community can have significant impacts on the identity and culture of the conquered, depending on the negotiations set into place between the invaders and native communities. A prominent example of these negotiations of imperial control occurred in the prehistoric highlands when the Inca rose to power during the Late Horizon (LH, AD 1400–1532). One social area the Inca targeted when incorporating communities into the empire was the alteration of their ancestor associations and behaviors (ayllu obligations), which makes mortuary studies a key part of investigations into Inca imperial influence. This project focuses on the Chanka, a culture that developed during the Late Intermediate period (LIP, AD 1000–1400) in the Andahuaylas region of Peru and was known infamously by the Inca as a group of warriors they conquered in battle before expanding into the rest of the Andes. However, bioarchaeological evidence found at the site of Sondor shows a different type of relationship between the Chanka and Inca. Here we will present preliminary findings from excavations at Sondor, dated to the late LIP and early LH, showing changes in mortuary styles and evidence of widespread health issues, interpersonal violence, and nonlocal trepanation styles.

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

[95]

*Virtual Reality and Archaeological Practice*

Virtual reality (VR) is a tool that offers an opportunity to approach archaeological analyses and communications through a different lens. VR provides a platform where data can be continuously updated and modified as it becomes available as well as adding an element of interactivity. VR allows the user to engage with a simulated environment, walk around, pick up objects, and become immersed in their surroundings. My research explores using VR to reconstruct an archaeological site using excavation and drone data. The Ostra Collecting Station, a mid-Holocene site located on the northern coast of Peru, is situated on top of an ancient sea-cliff with evidence of early defensive mechanisms. The use of VR can allow archaeologists to visualize site data with geographic context, site development, and the transition to abandonment much more effectively than when using traditional 2D representations alone.

Blain, Hugues-Alexandre [240] see Jovanovic, Mihailo

Blair, Elliot [49] see Cajigas, Rachel

Blake, Michael [20] see Lyons, Natasha

Blake, Michael [20] see Vallebuena-Estrada, Miguel

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

[71]

*The Quivira Connections*

Although it was visited by three Spanish expeditions, knowledge of Quivira quickly became enshrouded in myth. Nevertheless, early documentary evidence suggests that the land of the ancestral Wichita was extensive, heavily populated, and an important source of bison products for both the Greater Southwest and the Southeast. At the western end, a Nahuatl-based lingua franca facilitated intercultural exchange. Archaeological remains suggest contact with portions of Mesoamerica.

Blanchard, Joseph [136] see Nolan, Kevin

Blaszczyk, Marcin [34] see Maciej, Arkadiusz

Blatt, Samantha [174] see Dickens, Florence

Bliege Bird, Rebecca [97] see Winterhalder, Bruce

Blinman, Eric [239] see Jones, Shelby

Blom, Deborah [29] see de la Rosa-Martinez, Marcos

**Blomster, Jeffrey (George Washington University) and Cuahtémoc Vidal Guzmán (George Washington University)**  
[242]

*Persistence in Ruins: Animation, Remembrance, and Rupture at Etlatongo, Oaxaca*

Rather than static vestiges of the past, we view ruins and material objects from the past as important generative components of communities and human projects. Informed by a relational ontology that views some objects and matter as charged and animate, we situate our research at Etlatongo in broader Mixtec and Mesoamerican perspectives on things and landscapes. Mixtec codical narratives, for example, indicate certain materials and ruined places could be especially potent, imbued with cosmogonic energy from previous eras, and in some cases index ruptures. Such material had animating properties as well as inspiring memorial narratives. Continuously occupied for more than 3,000 years, Etlatongo, in the Nochixtlán Valley of the Mixteca Alta, presents a particularly felicitous locale for our investigations, as generations of residents would have constantly interacted with the materiality of previous occupations. We explore three case studies in the persistence of engagements with past things and ruins: the quarrying of charged soil from the public space of Etlatongo's Early Formative ballcourts and subsequent memorializations of this space, the selection and deployment of stylistically distinct Early Formative figurine heads in contexts half a millennium later, and ongoing interaction with this space and its adjacent historic era hacienda by contemporary residents.

Blomster, Jeffrey [146] see Salazar Chávez, Victor

Blomster, Jeffrey [146] see Sigafos, Rebecca

**Blondin, Émilie (Harvard University), Lindsey Bouldin (Harvard University), Sarah Faber (Harvard University), Cindy Tian (Harvard University) and Grace Motes (Harvard University)**  
[181]

*Close to Home: Public and Institutional Archaeology in the University Setting*

During the fall of 2021, a group of 13 students, a graduate teaching assistant, and two professors continued the years-long excavations and credit-offered course of the Harvard Yard Archaeology Project, which takes place among one of the busiest tourist attractions and academic centers of Boston. A primary goal of the 2021 field season was to further characterize the extent of the building foundations of the Old College, a seventeenth-century building of early Harvard, although larger goals include presenting archaeological excavations to the general public. As former students of the class, we have experienced firsthand the ways that public archaeology can intersect with studying archaeology in a university setting. Therefore, we hope to present the larger SAA community with answers to the following questions: How do excavations within universities contribute to public archaeology? What is the role of student archaeologists participating in

public archaeology? How does a class that advocates for public archaeology influence students' desires to pursue a career in archaeology? We will propose a survey and a plan to interview students who have completed the Harvard Yard Archaeology Project and similar classes at other institutions to answer the questions presented here.

**Blong, John (Washington State University), Helen Whelton (University of Bristol), Dennis Jenkins (University of Oregon), Ian Bull (University of Bristol) and Lisa-Marie Shillito (Newcastle University)**

[235]

*Human Adaptation to Middle Holocene Aridity in the Northwestern Great Basin: Coprolites and Season of Occupation at the Paisley Caves, Oregon*

The middle Holocene (9000–6000 cal BP) in the northwestern Great Basin is marked by warmer and drier conditions resulting in significant ecological change. There is archaeological evidence for population decline, highly mobile groups occupying temporary camps, and a focus on seasonally productive resources. Most sites are located on dunes or lake margins near water, and there is only ephemeral use of cave sites.

Archaeological sites from this period are rare, so there is a paucity of information on how humans adapted to this significant period of climate change. This study focuses on the middle Holocene human coprolite record from the Paisley Caves, Oregon, and applies a seasonality model to investigate the season of occupation at the Paisley Caves during this period. This paper presents the results of fecal biomarker analysis demonstrating human origin for coprolites from the Paisley Caves, as well as plant macrofossil and microfossil analysis of coprolite contents to assess human diet and season of occupation. The results of this study suggest that subsistence activities at the Paisley Caves remained an important part of seasonal subsistence rounds during the middle Holocene as part of a broader adaptation to an arid climate.

Blong, John [179] see Holcomb, Justin

Blong, John [130] see Kingrey, Haden

**Blumenfeld, Dean (Arizona State University)**

[73]

*Mississippian Modes of Exchange: Documenting Shifting Networks and Distribution at Ancient Cahokia*

This study investigates changes in distribution at the ancient Mississippian site of Cahokia using social network analysis. Over the course of its history, Cahokia transformed from a small village to a large macroregional center. This transformation was accompanied by a marked increase in institutional complexity, specialization, rank/class differences, and monumental construction. The application of social network analysis reveals that Cahokia's network structure radically changed as it expanded, indicating that the overall mechanism of distribution was altered alongside a developing social, political, and economic system. These findings further contribute to our understanding of Cahokia and the mechanisms that underpinned its development.

**Blumhardt, Cameron (Washington State University) and Colin Grier (Washington State University)**

[177]

*Clam Gardens as Coastal Landscape Agents: The Case of Shingle Point, Valdes Island, British Columbia*

In recent years, mariculture has been the focus of numerous anthropological and archaeological studies across the Northwest Coast. Clam gardens (also sea gardens) were utilized by Salish peoples to provide food security, sustainability, and resilience. As elements of the built environment they also represent significant engagements with coastal landscapes. We present research that focuses on the latter element, evaluating the potential impacts that clam gardens had on coastal landscape evolution in locations where they were constructed. Our case study focuses on Shingle Point, Valdes Island, British Columbia, where a large clam garden was constructed over the last several millennia. We characterize potential changes in geomorphological and sediment transport processes resulting from its construction using a variety of

methods, including sediment coring, ground penetrating radar, remote sensing, and coastal sediment transport modeling. Our objective is to consider clam gardens not just as food production features, but as large scale structuring agents of longer term coastal processes. The ultimate goal of the research is to provide a broader view of the role of clam gardens in shaping the evolution of cultural keystone places in order to support First Nations in their pursuit of future food security and food sovereignty.

Blumhardt, Cameron [177] see Baley, Tyler

Bocanegra-Ramírez, Dulce Maria [13] see Domínguez-Vázquez, Gabriela

Bocko, Grace [104] see Wilson, Jeremy

**Boehm, Andrew (Museum of Natural and Cultural History, University of Oregon), Chris Widga (East Tennessee State University) and Daniel Gilmour (Willamette Cultural Resources Associates)**

**[62]**

*Updating the Late Pleistocene Record of the Willamette Valley, Oregon*

Near the end of the Pleistocene, 35 genera of mostly large mammals became extinct in North America, yet the cause of these extinctions remains debated. The Willamette Valley in western Oregon boasts a robust record of up to nine megafaunal taxa (*Mammuthus*, *Mammut*, *Equus*, *Paramylodon*, *Megalonyx*, *Camelops*, *Hemiauchenia*, *Castoroides*, and cf. *Aenocyon dirus*). A similarly rich regional archaeological record indicates humans and extinct fauna occupied the same landscape for at least 3,000 years, but there is only limited evidence of human-megafauna interaction. In this paper, we update the late Pleistocene record of extinct megafauna from Western Oregon's Willamette Valley. We contribute new radiocarbon and stable isotopic data from previously un-sampled mammoth and ground sloth specimens. Further, we demonstrate that a newly recognized species of mastodon in western North America, *Mammut pacificus*, inhabited the Willamette Valley in the terminal Pleistocene and its timing overlapped the earliest known human occupation of the region.

Boessenkool, Sanne [56] see Kandel, Andrew

Boethius, Adam [29] see Scott, Michael

Bogaard, Amy [142] see Kohler, Tim

Bogicevic, Katarina [240] see Jovanovic, Mihailo

Bogicevic, Katarina [240] see Savkovic, Aleksandra

**Boileau, Arianne (Mount Royal University)**

**[218]**

*Chair*

**Boileau, Arianne (Mount Royal University), Kitty Emery (Florida Museum of Natural History), Ashley Sharpe (Smithsonian Tropical Research Institute), Grace Zhang (Simon Fraser University) and Dongya Yang (Simon Fraser University)**

**[218]**

*Exploring Freshwater Turtle Population Dynamics in the Maya World through Ancient DNA Analysis*

In the Maya world, zooarchaeological studies have recorded regionally focused declines in animal abundances due to drying conditions and land clearance. However, zooarchaeological data alone cannot document fluctuations in animal population structure or diversity, an insight that can be provided by ancient DNA analysis. In this study, we use archaeogenetics to evaluate temporal and spatial changes in the genetic structure and diversity of the Central American river turtle (*Dermatemys mawii*) in the Maya area. The turtle specimens come from a suite of archaeological sites in Guatemala and Belize, spanning the Preclassic to colonial periods. We use PCR to obtain multiple short mitochondrial DNA (mtDNA) fragments to confirm species identification and examine genetic variation over time and space to estimate potential population changes. To assess turtle populations' possible resilience or vulnerability to climatic and anthropogenic pressures, we further contextualize the periods of expansion and contraction of turtle populations within Maya history. Overall, this study will provide critical data on the long-term and complex relationships between Indigenous peoples and the landscape they inhabited.

Boileau, Marie-Claude [211] see Moore, Katherine

Bojkowska, Dorota [34] see Zych, Boleslaw

**Bolster, Alyssa, Natasha Vang (Vanderbilt University) and Tiffany Tung (Vanderbilt University)**  
[29]

*Diet and Foodways in the Wari Imperial Hinterlands: Stable Isotope Analysis of the La Real Burial Population (600–1000 CE), Arequipa, Peru*

Stable carbon and nitrogen isotope analysis is employed to assess diet in times of Wari influence in the southern hinterlands between the early (600–800 CE) and late (800–1000 CE) Middle Horizon (MH). We analyze bone collagen from 57 individuals interred at La Real, corresponding to two chronologically distinct mortuary contexts at this Majes Valley site ( $n = 22$  early MH,  $n = 35$  late MH). Results show no significant difference in  $\delta^{13}\text{C}$  values between the two temporal groups. Individuals from the earlier context displayed significantly higher  $\delta^{15}\text{N}$  values than those from the late MH. These temporal comparisons hint at stability in maize and chicha consumption and decline in protein consumption with Wari imperial encroachment. However, the range of  $\delta^{13}\text{C}$  values suggests increasing stratification in access to  $\text{C}_4$  plants. We also compare La Real stable isotope values to seven other Middle Horizon sites. La Real has significantly different  $\delta^{13}\text{C}$  values from the other sites, excluding Beringa (also in the Majes Valley); statistically similar values were seen for  $\delta^{15}\text{N}$ . Significant differences in diet between La Real and other MH sites other than Beringa point to the effects of local ecology, durable trade relations, and local cultural food preferences in shaping community dietary patterns.

**Bommarito, Savannah (University of Utah), Andrea Brunelle Runburg (University of Utah), Simon Brewer (University of Utah) and Isaac Hart (University of Utah)**  
[121]

*A Multiproxy Analysis of Fire, Vegetation, Climatic, and Anthropogenic Activity during the Mid- to Late Holocene in the West Desert of Utah, United States*

Pollen from cave sediments within Hogup Cave and pollen and macroscopic charcoal found in a nearby 268 cm sediment core were analyzed and used as proxies to reconstruct the paleoecological and anthropogenic record of Hogup Cave and the surrounding region, found in the West Desert of Utah. The relationship between Paleoindians and their use of the environment can be disentangled by examining regional and ethnobotanical pollen from Hogup Cave, which has been intermittently occupied and its stratum previously dated. Several radiocarbon dates were acquired in the Crescent Springs sediment core to create a Bayesian age model representing sediment deposition. We focused on the last 6,000 years, when the last substantial occupational hiatus occurred in Hogup Cave. There is a conspicuous lack of fire prior to ~6,000 years, likely

due to regional depopulation and reduced fuel load during the middle-Holocene dry period, after which many peaks of various magnitudes in both woody and grassy charcoal occur.

**Bond, Julie (University of Bradford, UK), Stephen Dockrill (University of Bradford, UK) and Nicole Burton (University of Bradford, UK)**

[173]

*The Relentless Tide: Swandro, a Multi-period Settlement Being Lost to the Sea*

The Knowe of Swandro, (Orkney Islands, Scotland) was a large settlement occupied from around 800 BCE to CE 1200 and consists of Iron Age roundhouses, Pictish buildings, and a Viking/Norse settlement, much of which has already been lost to the sea. A substantial Iron Age roundhouse that had been occupied for many generations formed the focus of the settlement. Erosion hastened by climate change is the biggest threat to coastal sites such as these, but it also provides a unique opportunity to investigate the roundhouse and surrounding settlement. While over a third of the roundhouse has been lost to coastal erosion, the site remains rich in cultural materials and evidence for past uses of land and sea. This project applies some of the latest techniques of 3D digital recording together with careful excavation, and here we provide new insights into unexpected mechanisms of cultural loss through tidal action. These results will be of crucial value to future management of similar coastal heritage assets. Public engagement, through a number of avenues including site tours, cultural demonstrations, and social media, is also a means of providing identity of place and history to both islanders and visitors alike.

**Bond Reis, Lucas (University of Arizona), Thiago Umberto Pereira (Universidade Federal de Santa Catarina, Brazil), Lucas Bueno (Universidade Federal de Santa Catarina, Brazil), Julia Reis Cordeiro (Trent University, Canada) and Simon-Pierre Gilson (Universidade Federal de Santa Catarina, Brazil)**

[46]

*Unveiling Laklãnõ-Xokleng Stories: The Southern Je Archaeological Context in the Upper Itajaí Valley (Santa Catarina State, Brazil)*

This presentation builds on research conducted by the LEIA/UFSC team in the Upper Itajaí Valley (Santa Catarina State, Brazil) to put together components of a deep Laklãnõ-Xokleng history associated with the data archaeologically labeled as Southern Je. Contexts related to this archaeological category indicate that sites composed of pithouses began to be built around 1400–1300 BP in this region. However, the Laklãnõ-Xokleng oral history, transmitted by the elders, attests to its ancestral territorial occupation since time immemorial. The components of this long-term history are marked on the landscape in known places and recognized by communities on walks amid plants, rivers, rocks, animals, and past settlements. This paper discusses similarities, differences, continuities, and discontinuities at the regional level to weave a narrative that considers archaeological variability and Indigenous ontologies. The outcomes of this comparison are interpreted as fragments of stories associated with a long-term Laklãnõ-Xokleng past.

**Bongers, Jacob (Boston University), Nathan Nakatsuka (New York Genome Center), Colleen O'Shea (American Center for Mongolian Studies), Thomas Harper (Pennsylvania State University) and Lars Fehren-Schmitz (University of California, Santa Cruz)**

[22]

*A Multidisciplinary Approach to Inca Resettlement in the Andes*

We employ a novel multidisciplinary approach to test the Inca (ca. 1400–1532 CE) policy of forced resettlement (mitma) in the Chíncha Valley, Peru. This political strategy significantly transformed the Andean demographic landscape, but it has only been proposed based on intriguing yet ambiguous written sources and archaeological data. We integrate ancient DNA (aDNA) with archaeological, isotopic, and written evidence to investigate six individuals from two cemeteries that date to the Inca and Colonial (1532–1825 CE) periods. These independent datasets are consistent in their support for Inca movement of peoples from the far north of their empire to the Chíncha Valley. Such results are some of the strongest evidence yet of Inca

resettlement in the Andes. Our research demonstrates the power of multidisciplinary research designs that incorporate aDNA and sets a methodological “gold standard” for addressing questions of mobility in the past.

Bonorden, Brooke [129] see Houk, Brett

**Bonzani, Renee (University of Kentucky), Michael Steenken (University of Kentucky), Jon Endonino (Eastern Kentucky University), Michael Detisch (University of Kentucky) and Hugo Reyes-Centeno (University of Kentucky)**

[148]

*Morphological and Chemical Signatures of Chenopodium: Application of Optical and Electron Microscopy to Seeds from Experimental and Archaeological Contexts*

Humans are considered natural seed dispersing agents through the social acts of seed saving and seed sowing. The intentional and unintentional results of these human-plant relationships can lead to the development of genotypic and phenotypic traits that are beneficial to both the plant and to their human influencers. Anthropogenic seed dispersal of wild *Chenopodium* plants and domestication are associated in the archaeological record with concomitant morphological changes, including a reduction in testa (seed coat) thickness. In this pilot study, we tested two imaging approaches to quantify *Chenopodium* seed morphology, namely high-resolution optical scanning and scanning electron microscopy (SEM). First, we conducted a validation experiment on extant modern *Chenopodium* seeds, both uncarbonized and carbonized. Next, we analyzed carbonized seeds recovered from the archaeological excavations of two rockshelters (15JA120 and 15JA122) located within the Daniel Boone National Forest in eastern Kentucky. Our results show a difference in testa thickness measurements dependent on the microscopy technology applied and on the degree of carbonization. In addition, we discuss the morphological characters contrasted in the modern and archaeological carbonized *Chenopodium* specimens, including differences in surface structure, margin configuration, and beak prominence, as well as chemical signatures captured through energy dispersive spectroscopy (EDS).

Boomhower, Daniel [238] see Baron, Joanne

**Borgens, Amy (Texas Historical Commission)**

[135]

*The 1817 Privateer Ghost Fleet of Matagorda, Texas, and the Search for Louis-Michel Aury's Lost Port*

In May 1817, French privateer Louis-Michel Aury was at a crossroads. After disembarking filibusters on the northern coast of New Spain and reconnoitering a new camp location in Matagorda Bay, he returned to Galveston Island only to learn it had been usurped by the famed pirate Jean Lafitte. Aury retreated to Matagorda Bay with more than a dozen vessels and established a new headquarters at the Spanish port of Matagorda, but his time there was brief. Aury abandoned his port under abrupt and mysterious circumstances, leaving destruction in his wake. Most of his fleet lay in burned ruins and, after a brief return to Galveston, he relocated to Amelia Island at the invitation of adventure Gregor MacGregor. The location of Aury's lost fleet has eluded archaeologists, in part due to inexact accounts of Matagorda's location and its sometimes confusion with a nearby Texas port of the same name. Archival records suggest 11 vessels of Aury's Mexican privateer fleet are in the vicinity of Pass Cavallo, Texas. This paper discusses Aury's tenure in Texas, the archival sleuthing to uncover the potential location of Aury's lost fleet, and the two recorded shipwreck sites potentially linked to this history.

**Borovinic, Nikola and Mile Bakovic**

[240]

*History of Research at Crvena Stijena, Montenegro, 1954–2016*

The rockshelter of Crvena Stijena has been well-known for over 60 years as one of the most important

prehistoric archaeological sites in the Balkan Peninsula. Discovered in 1954, its excavations in the ensuing decade by renowned Yugoslavian prehistorians revealed a continuous cultural sequence over 20 m deep, containing deposits from the Bronze Age, Neolithic, Mesolithic, Upper Paleolithic, and Middle Paleolithic. The excavations from 1954 to 1964 were fully published in 1975 in a scientific, multidisciplinary monograph. In 2004, research at the site was resumed by a joint University of Michigan–Center of Archaeological Investigations of Montenegro team, which carried out an absolute dating program, clarified the geological history of the site, and began to excavate, with modern methods, the Middle Paleolithic deposits. The results of this project were published in a monograph in 2017 that summarizes the research of over a dozen specialists on the cultural remains, macrofaunal and macrobotanical remains, chronology, and geological studies at the site. The scientific results of this project and the removal of massive layers of sterile deposits overlying the Middle Paleolithic layers in 2014 made the current project formed by the University of Minnesota and the National Museum of Montenegro, which began in 2017, feasible.

Borovinic, Nikola [240] see Monnier, Gilliane

Borovinic, Nikola [240] see Pajovic, Goran

Borovinic, Nikola [240] see Porter, Samantha

**Borrego, Raylene, Marisol Cortes-Rincon (Cultural Resource Facility, Cal Poly Humboldt), Hannah Vizcarra (Cultural Resource Facility, Cal Poly Humboldt), Amanda Zetz (Cultural Resource Facility, Cal Poly Humboldt) and Kristen Harrison (Cultural Resource Facility, Cal Poly Humboldt)**

[77]

*An Overview of the Dos Hombres to Gran Cacao Archaeology Project Soil Testing and Methodologies*

This paper aims at emphasizing the importance of soil science practice to archaeology thus adding a scientific analytical nature to the cultural nature of archaeology. This report explores this field application of pH and NPK testing in the Dos Hombres to Gran Cacao Archaeology Project area located in northwestern Belize. These types of testing are of great use in specific contexts such as determining activity use areas. Taken all together, when reinforcing other characterizing methods, soil chemistry has an immediate theoretical advantage in that it provides another method to complement, refine or even negate prior analyses in ways that merely visually-dependent field methods cannot. In addition, soil chemical analysis strengthens the case for practice theory as an appropriate theoretical framework for explaining the various uses of social and physical space. How and why cultures manipulate the environment is closely tied to the manner in which individuals in the culture's past engaged in the same activities.

Borrego, Raylene [17] see Cortes-Rincon, Marisol

Borrego, Raylene [55] see Vizcarra, Hannah

Borrego, Raylene [95] see Zetz, Amanda

**Borsodi, Sara (University of Michigan), Lydia Luncz (Max Planck for Evolutionary Anthropology), David Braun (George Washington University) and Jonathan Reeves (Max Planck Institute for Evolutionary Anthropology)**

[69]

*Inferring Behavior from Damage Patterns: Bipolar Knapping and Nutcracking*

Little is known about behaviors associated with the percussive technology of the Early Stone Age (ESA). Primatology provides a rare opportunity to observe how percussive behaviors produce damage patterns on stone tools. Although primate behavior provides a framework for inferring behaviors associated with ESA percussive tools, the distinction between damage associated with flaking behaviors and food processing behaviors remains unclear. Additionally, how percussive behaviors produce differing damage patterns on a range of raw materials used by hominins is not well understood. We present experimental research examining damage patterns produced by bipolar knapping and nutcracking. Five different rock types believed to be used by hominins from the Koobi Fora Formation, Kenya, were used. Each produced distinct damage

patterns between percussive behaviors. The accrual of damage was documented by 3D scanning each anvil at different points of use. R and QGIS were used to quantify roughness. Our results show that damage accrues slowly, suggesting that anvils in the archaeological record that display significant damage and pitting experienced repeated or extensive use. Furthermore, damage accrual is material and percussive behavior dependent. This work forms a basis that can be used to infer a variety of behaviors associated with percussive tool use.

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

[45]

*A Multifaceted Approach to Understand the Late Prehistoric Transition in the Maumee River Valley of Northwestern Ohio*

The Late Woodland-Late Prehistoric transitional period of Northwestern Ohio (ca. AD 1250) has been the subject of much debate in past decades. Both the details and cause of Upper Mississippian influence in the Western Lake Erie region currently remain unclear. My project focuses on a 3-mile span of the First Rapids of the Maumee River floodplain, where I combine reanalysis of previous excavations at three significant sites with new, minimally-invasive fieldwork methods and petrographic analysis of pottery. With these methods, changes in settlement and ceramic-making will be investigated to understand actual causes of this cultural transition. This poster will discuss preliminary findings from the implemented multifaceted approach.

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

[164]

*Chair*

**Boswell, Alicia (UC Santa Barbara) and Carol Mackey (CSU Northridge)**

[164]

*Jerry Moore's Influence on North Coast and Far North Archaeology in Peru, Past and Future*

Jerry Moore has contributed much to archaeology and specifically to research on Peru's North Coast. Carol Mackey discusses the originality of Moore's work on monumental architecture on Peru's North Coast and working with him. Alicia Boswell shares how Moore's work on built environments, place, and experience is influencing her research in the Upper Piura valley, Perú. They look forward to reading whatever Jerry is working on next.

Boudreaux, Edmond, III [64] see Krus, Anthony

**Bouldin, Lindsey (Harvard University)**

[122]

*Bread, Beer, and Beef: Diet of Seventeenth-Century Harvard College*

While historical documents can provide a plethora of information for the historical archaeologist, they are often incomplete in revealing holistic images of the day-to-day life of humans that lived centuries ago. This poster presentation outlines my ongoing research on the diet of students at seventeenth-century Harvard College. In particular, I address the question, To what degree is the archaeological assemblage recovered by the Harvard Yard Archaeology Project represented or not in Harvard College archives? This poster includes data acquired from archival research and contemporary faunal analysis, including ZooMS, a proteomic method that can identify the species of the smallest of bones, to better understand the lived experiences of the English and Indigenous students at the first Puritan educational setting in North America.

Bouldin, Lindsey [181] see Blondin, Émilie

**Boure, Azure (Suquamish Tribe)****[107]***Discussant*

Bourgeon, Lauriane [15] see Norman, Lauren

Bouvier, Darian [170] see Widga, Chris

**Bovy, Kristine (University of Rhode Island)****[221]***Moderator***Bowers, Mozelle and Sara Juengst (University of North Carolina, Charlotte)****[237]***Children at the Heart of Buen Suceso*

Children in antiquity provide bioarchaeologists with a window into the past as they embody the environment and culture around them (Halcrow and Tayles 2011). Due to subadults' sensitivity to biocultural factors, they are excellent indicators of the health and nutrition of a society (Beauchesne and Agarwal 2019). In South America, the death of children and infants was marked as a special event by the conversion of these individuals into symbolic ancestors, and their burial at significant locations often created and reinforced community identity (Moseley 2010). At Buen Suceso, the only skeletons recovered were subadults. To date, the remains of 10 subadults have been excavated from the structure and the plaza areas of the site. Given the auspicious location of these burials and the ubiquity of subadult remains, this paper will discuss both the symbolism of interment of children at special locations and what subadult remains at Buen Suceso can tell us about the social organization and health of the community through the evaluation of signs of skeletal stress, such as linear enamel hypoplasia, cribra orbitalia, and periosteal new bone formation.

Bowers, Mozelle [237] see Cruz, Zindy

Bowers, Mozelle [237] see Rojas, Jean-Paul

Bowers, Mozelle [237] see Stumpf, Mara

Bowman, Robert [15] see Yeske, Kate

**Bowser, Brenda (CSU Fullerton)****[59]***Discussant***Boyd, Lars****[27]***A Reclassification of the High Plains Upper Republican Ceramics from Buick Campsite: Buick Collared and Buick Straight*

Ceramics from Buick Campsite (5EL1), a High Plains Upper Republican open camp in eastern Colorado, were previously classified as Frontier and Cambridge ware of the Central Plains Tradition Upper Republican Culture. However, analyses of 568 sherds from excavations and surface collections indicate that vessel morphology was significantly different than vessels from Mowry Bluff (25FT35), the type site of Frontier and Cambridge ware. Buick Campsite vessels were mass modeled from the bottom up using local clays and

temper, had thicker parabolic bottoms, thicker base walls, high rounded shoulders, and a taller rim and lip than Frontier and Cambridge types. While Buick Campsite ceramics resemble Central Plains Upper Republican wares in rim and lip morphology and decoration, they differ from them in shape, size, and essential details of manufacture. These differences are sufficient to propose that the ceramics from Buick Campsite be termed Buick collared and Buick straight types of High Plains Upper Republican ware and the ceramics from Mowry Bluff be identified as Frontier and Cambridge types of Central Plains Upper Republican ware. In this way the differences in size and shape generated by variations in production are identified by type names, while similarities in appearance are identified by ware designation.

**Boyer, Cassandra (University of Nevada, Reno), Briana New (University of Nevada, Reno), Arielle Pastore (University of Nevada, Reno), Jenevieve Walbrecker (University of Nevada, Reno) and G. Richard Scott (University of Nevada, Reno)**

**[248]**

*Anatomical Characteristics of the Pedal Skeleton Provide Insights into the History of Human Footwear*

There is no footwear in nature—only hooves and soles. Protecting feet through artificial means is a human invention of relatively recent origin. The oldest direct evidence for footwear includes woven sandals and moccasins dating to the early Holocene. Inferences from footprints, decorative beads, and morphological analysis of phalanges suggest an earlier emergence of the practice. By exploring footprints and bones of the foot, researchers contend that footwear appeared in the Middle Paleolithic while humans became habitually shod by the Upper Paleolithic. Biomechanical and morphological analysis of the metatarsals show a significant decrease in bone robusticity, suggesting energy from walking is dispersed by footwear. Changes in the valgus angle are attributable to the constricting nature of footwear that prevents the toes from spreading and suggests the habitual use of footwear. In modern humans, there is a patterned geographic distribution of habitually shod individuals. In colder climates, individuals exhibit gracile metatarsals and phalanges consistent with the habitual use of footwear (e.g., Inuit mukluks). In warmer climates, humans retain robust phalanges, suggesting little or no use of footwear. We review the morphology of foot bones and determine what insights biological anthropologists can bring to bear on footwear in antiquity.

**Boyles, Kerry (Cambridge University Press & Assessment)**

**[195]**

*Discussant*

**Bracken, Justin (University of Utah Press)**

**[84]**

*Surveillance, Fortification, and Movement around the Petén Lakes*

The physical movement of people across the terrain is implicit to notions of migration, trade, and warfare. Numerous factors determine the specific paths taken by individuals and groups in motion, some physical and others conceptual. Tracing the physical conduits and limitations to travel across a particular landscape will therefore not provide a complete picture of patterns of movement but can illustrate likely and unlikely paths. The Petén Lakes region offers the potential of water-based transport, known to have been accomplished by canoe, in addition to overland routes across the undulating terrain through naturally dense forest. Least-cost corridors of movement as preferred paths are complicated by the surveillance potential from sites in the area, often located at local high points and further augmented vertically by construction, as well as other occupied perches. The study presented here assesses likely paths of movement across the Petén Lakes region as modulated by the terrain, with consideration of the surveillance potential from the fortified site of Muralla de León on the northeast shoreline of Lake Macanché.

Bradford, Katherine [127] see Johnson, John

**Bradley, Erica (University of Nevada, Reno), Geoffrey Smith (University of Nevada, Reno) and Kenneth Nussear (University of Nevada, Reno)**

[64]

*Using Predictive Modeling to Evaluate Changes in Great Basin Paleoindian Settlement Systems through Time*

The Great Basin underwent considerable environmental change during the Pleistocene–Holocene transition, such as lower precipitation, increased temperatures, and the diminishment of lakes and wetlands. Archaeologists have long hypothesized that people responded by altering their settlement-subsistence strategies. Some models outlining these responses predict people should have added new habitats to their foraging itineraries; however, such models have been difficult to evaluate using empirical data because radiocarbon-dated sites are rare and, until recently, the ages of different Western Stemmed Tradition projectile point types have remained unclear. We test the hypothesis that early Holocene groups added new habitats through a predictive modeling technique known as ecological niche modeling. We develop two models—one for the Younger Dryas and one for the early Holocene—using recorded Paleoindian sites in Humboldt County, Nevada, and a set of environmental variables. Our results show that Younger Dryas sites mostly occur around lowland and upland lakes and within ecotones, while early Holocene sites mostly occur around valley bottoms, riparian corridors, and upland springs. They demonstrate that people added new habitats, presumably in response to disappearing wetlands. This shift may be best explained using the patch choice model.

**Brady, James (Cal State L.A.)**

[81]

*Chair*

**Brady, James (Cal State L.A.)**

[81]

*The Cave-Pyramid Complex: An Assessment of Its Impact after 25 Years*

In the 25 years since the publication of “Settlement Configuration and Cosmology: The Role of Caves at Dos Pilas,” a number of significant discoveries of architecture constructed in relation to caves have been made. The discovery of the man-made cave constructed beneath the Pyramid of the Plumed Serpent at Teotihuacan is perhaps the most spectacular. Resistivity data that suggest possible caves beneath the Castillo at Chichen Itza and the Pyramid of the Moon at Teotihuacan raise the possibility that additional important structures at major sites were involved in the Cave-Pyramid Complex. Despite substantial evidential support for the complex, this paper concludes that it has not had a dramatic impact on archaeological thinking outside of the cave community and discusses the reasons for this.

Brady, James [81] see Benoit, Taylor

Brady, James [81] see Iglesias, Christina

Brady, James [81] see Karkkainen, Vanessa

Brady, James [81] see Salcido, Ulysses

Brady, James [196] see Saldana, Melanie

**Brady, Ryan**

[21]

*Chair*

**Brady, Ryan, Julie Royer (Dudek), Loukas Barton (Dudek), Micah Hale (Dudek) and Brad Comeau (Dudek)**

[21]

*Toolstone Acquisition in the Interior of California’s South-Central Coast: Raw Material Extraction in the Mid- to Late Holocene*

The use of local vs. nonlocal toolstone sources can reveal much about past hunter-gatherer behavior. Toolstone-acquisition-related decisions reflect past people’s settlement strategy—“mapping on” or logistically

exploiting a stone resource, raw material quality, and environmental productivity. Our sample of nine sites is an optimal geographic context within which to investigate patterns related to toolstone acquisition in a toolstone-rich environment. In total, Dudek excavated over 200 m<sup>3</sup> of soil and recovered over 380,000 artifacts from sites within a 4,400-acre area. The project sites demonstrated varied strategies toward accessing and using the primary quarry sources, as well as more secondary ones. When combined with the information collected from recently excavated sites at adjacent localities (specifically from the coast and interior of Vandenberg Air Force Base), these data shed light on the many ways that raw material acquisition shapes patterns of regional hunter-gatherer settlement, subsistence, trade, and exchange.

**Braje, Todd (California Academy of Sciences), Jillian Maloney (San Diego State University), Amy Gusick (Natural History Museum of Los Angeles County), Jon Erlandson (University of Oregon) and Shannon Klotsko (University of North Carolina, Wilmington)**

[113]

*Changing Shorelines and Maritime Foraging during the Terminal Pleistocene and Early Holocene along California's Northern Channel Islands: Assessing Settlement Patterns with Chirp Subbottom Data*

The California Northern Channel Islands contain one of the best preserved and most abundant records of terminal Pleistocene and Early Holocene human occupation in all of North America. These records have contributed to our understanding of early coastal migrations, the importance of Paleoindian maritime economies, and the initial human settlement of the Santa Barbara Channel region. Interpretations have often hinged on calculating the distance of early archaeological sites to paleoshorelines, which traditionally has been accomplished using sea-level curves and bathymetric models that do not account for sediment deposited offshore after inundation by rising seas. Here, we use high-resolution Chirp subbottom data to reevaluate distance to paleoshorelines at two terminal Pleistocene and Early Holocene site clusters on the Northern Channel Islands and identify significant differences between the methods. Our results suggest that Chirp subbottom surveys offer more accurate reconstructions of ancient shorelines than bathymetric modeling and should be the new standard for reconstructing ancient settlement patterns of terminal Pleistocene and Early Holocene peoples along coastal and island environments around the world.

Braje, Todd [71] see Bruck, Seth

Brandão, Kelly [59] see Pugliese, Francisco

Brandão, Kelly [86] see Villagran, Ximena

**Brandeberry, Anna (University of Texas, Austin)**

[238]

*When, Where, and Why: Wielding the Wahy Over Time at El Zotz*

In *The Maya Scribe and His World*, Michael Coe published some of the first detailed photographs of a series of vases depicting ghoulish, supernatural characters identified by the Maya as “wahy.” With names like “Deer Death,” “Head Louse Spider Monkey,” and “Red Bile Death,” Coe and others associated the wahy with death, disease, and sacrifice. Many of the vases depicting these creatures were produced at El Zotz, in Guatemala. Since the dynasty was founded, rulers and nobility at El Zotz wielded the wahy as a source of political power. This paper will discuss how the wahy evolved over time in the Buenavista Valley, the contexts where they were evoked, and their role in Maya politics. The wahy vases of El Zotz are also unique in that they were all looted during the systematic plundering of the site in the 1980s. Due to a paucity of stone inscriptions at El Zotz, looted vases were the primary source used by scholars to piece together Pa’ka’n’s dynastic history. Given the heavy looting of El Zotz, research about the site is enmeshed in the study of looted artifacts.

Brandt, Steven [2] see Smith, Benjamin

**Braswell, Geoffrey (UC San Diego)****[204]***Ancient Obsidian Trade in Campeche, Mexico*

Those of us who were fortunate enough to work with Willie Folan all know that he was generous to a fault. I was invited first to study obsidian artifacts excavated by his team at the great Preclassic to Classic Maya city of Calakmul, and then to continue that work with later projects, including Postclassic Champotón. Over the decades, Willie and Lynda continued to extend their hospitality and generosity by including me in publications, helping my students take their first steps in Maya archaeology, and through numerous invitations to work in the lab or even stay with them. In this paper, I try to summarize the research I conducted with the Folans concerning ancient obsidian exchange, production, and consumption in the western Maya lowlands.

**Braun, David (George Washington University), Benjamin Davies (Yale University), Matthew Douglass (University of Nebraska, Lincoln), Sam Lin (University of Wollongong) and Jonathan Reeves (Max Planck Institute for Evolutionary Anthropology)****[168]***Measuring Movement: The Influence of Scrapper Reduction Models on the Early Pleistocene*

The identification of the “Frison Effect” on Middle Paleolithic scrapper variability has had numerous subsequent implications. The initial influence revolved around our understanding of the then-prevailing use of typological distinctions in the Middle Paleolithic. However, the quantitative approach to evaluating reduction, use-life, discard, and site formation has had tremendous impacts throughout Paleolithic approaches. We summarize the major components of understanding reduction and its implication for how and where assemblages are formed, with a particular focus on how we understand movement in the archaeological record. This begins with direct applications of scrapper reduction to the Early Pleistocene record. Subsequent studies explore the quantification of reduction, use-life, and movement. The most recent examples include detailed predictions based on modeling of emergent patterns in the archaeological record. We highlight the specific long-term influences that scrapper reduction has had on how we identify changes in movement patterns in the past, with specific reference to the archaeological record of the Early Pleistocene in Africa.

Braun, David [69] see Borsodi, Sara

Braun, David [41] see Raskin, Levi

Braun, David [33] see Reeves, Jonathan

Braun, Greg [224] see Danielson, Andrew

**Bray, Tamara (Wayne State University) and Catherine Lara (Instituto Francés de Estudios Andinos)****[59]***Exploring Interethnic Relations in Southern Ecuador through a Comparative Study of Ceramic Production Technologies in the Late Precolumbian Era*

An important component of Inca statecraft involved the practice of uprooting communities from their home territories and relocating them to distant locales. Ethnohistoric documents indicate that southern Ecuador was densely populated by such transplanted populations, among whom were included specialists dedicated to state pottery production. Our recently initiated study in the Ecuadorian Austro addresses the question of whether ethnic integration occurred as a consequence of this imperial policy of resettlement. Our approach involves a focus on techniques of manufacture used to produce Inca and local Cañari pottery found in this region. Previous research indicates that Indigenous potters relied on a unique vessel-shaping method that involved the use of a paddle-and-anvil type technique. This paper reports on the preliminary results of our analysis of the processes involved in the production of local Cañari and imperial Inca ceramics. These findings shed light on who was producing Inca pottery and how; whether Inca pottery production by *mitmaquna*

operated in isolation from, or in more integrated fashion with, local pottery-producers; and whether exchanges of production techniques, vessel forms, or decorative styles occurred. The study provides new insights into the social dynamics engendered by the massive program of forced relocation undertaken by the Inca.

Breetzke, David [21] see Carlson, Justin

**Breiter, Sarah (Northwestern University)**

[189]

*Recycling Woodlands: Timber Use and Reuse in Timber Framed Buildings in West Suffolk, England*

Human-environmental relations, mediated by builders and householders, are visible in the framework of vernacular buildings. The builder's selection in material is mediated by geography and ecology, as well as land management practices, law, and social custom. In West Suffolk, England, there are hundreds of timber-framed buildings constructed between 1450 and 1700 that are still standing as homes and businesses. These vernacular buildings were largely constructed by carpenters who depended on local woodlands and wood-pastures to access fresh materials. Oak and elm timber was considered an important building resource, and there is documented evidence of its restriction by wealthy landlords both in the medieval and early modern period. In a survey of 30 buildings in this region, across urban and rural contexts, patterns of timber use reflect a widespread practice of recycling old timbers into new constructions. In both the market town of Bury St. Edmunds, and the rural landscape surrounding it, the widespread reliance on reused timber increased through time. There are multiple factors that potentially influence these patterns, including deforestation, restricted access to available timber, and changes in construction practices.

Brenet, Michel [21] see Spinelli Sanchez, Océane

**Brenner, Mark (University of Florida)**

[54]

*Drought and Cultural Instability*

Geologists and biologists work with archaeologists to address compelling questions about cultures of the past. Earth scientists who study tree rings, ice cores, speleothems, and lake sediment cores can provide information about the paleoclimatic and paleoenvironmental contexts in which ancient cultures developed, thrived, and disintegrated. Awareness of the negative socioeconomic consequences of recent global climate and environmental change has stimulated interest in past human-climate-environment interactions. Technological advances in remote sensing (e.g., lidar), stable isotope geochemistry, dating techniques, and ancient DNA analysis have enabled acquisition of large datasets that shed light on ancient human population densities, high-temporal-resolution paleoclimate (evaporation/precipitation ratio) and vegetation shifts, and presence/absence of prehistoric flora and fauna. Some profound cultural disruptions in the past were apparently associated with severe, protracted droughts (e.g., Maya, Tiwanaku, Anasazi). Yet many social scientists resist the notion that drought was the primary driver of cultural demise. The effect of climate fluctuations on cultural instability can be explored by (1) study of modern analogs (e.g., responses of sub-Saharan populations to recent droughts), (2) higher-resolution dating of paleoclimate archives and archaeological records to better temporally align the two, and (3) examination of the archaeological record for evidence of specific cultural responses to drying.

Brenner Coltrain, Joan [48] see Schollmeyer, Karen

Brenton, Ruth [101] see Sherfield, Anne

**Brevick, Paige****[105]**

*Learning about the Ancient World: Introducing Archaeogaming Education Modules (AEMs) as Classroom Resources*

Humanities education at the grade-school level, particularly that of the ancient past, has frequently been characterized as lacking in new technologies and teaching tools. Additionally, the subject of the ancient world itself can be complex and intimidating for teachers who may be unfamiliar with the topic. How can we make antiquity accessible and inviting to both learners and teachers? Archaeogaming is our answer. At Save Ancient Studies Alliance (SASA) we believe that there is tremendous educational potential to be found in the familiar format of video game graphics and in-game exploration. Over the past two years, SASA has created four Archaeogaming Education Modules (AEMs) that utilize the familiar footage of archaeologically themed video games, such as *Assasin's Creed* and *Total War*. Our AEMs are based around scripted historical videos, using game footage, which explore archaeological themes such as "Urbansim in Ancient Egypt & Mesopotamia" and "The Viking Diaspora." Videos are supplemented with discussion questions, games, activities, and background information written by subject matter experts and in collaboration with educational consultants. AEMs offer instructors the opportunity to easily embrace our shared human history, through methods that promote active learning and are relevant to today's youth.

Brewer, Jeffrey [17] see Dunning, Nicholas

Brewer, Simon [121] see Bommarito, Savannah

Brewer, Simon [27] see Moffatt, Maren

Brewer, Simon [97] see Vernon, Kenneth

**Brewer-Jensen, Ella (University of Oklahoma), Thomas Fenn (University of Oklahoma), Lekha Sripathi (University of Oklahoma), Jeffrey Fleisher (Rice University) and Stephanie Wynne-Jones (University of York)**

**[166]**

*Economic Changes through Time along the Tanzanian Swahili Coast, as Seen through the Examination of Non-ferrous Metals and Metallurgical Technologies*

Historic Swahili towns along the East African coast played prominent roles in the triangular Indian Ocean maritime trade linking East Africa with India and the Persian Gulf/Red Sea, but the impact and extent of economic changes through time in these towns are still poorly understood. Examining non-ferrous metals, many imported and reworked locally, can serve as a proxy to understand the impact of Indian Ocean trade on local economies, with particular regard to the consumption of semi-exotic materials and finished goods. Copper-based metals (and even lead metals) were commonly imported and worked locally, but some may have been produced locally or regionally. Therefore, studying these metals and their metallurgy from Swahili sites in Tanzania can provide insights into socioeconomic aspects such as organization of production and workshops, consumption patterns as well as networks connecting these sites to the hinterland and the Indian Ocean world. To that end, copper-based metals were examined from several Swahili archaeological contexts along the Tanzanian coast dating from the seventh century CE to the sixteenth century CE. Results of chemical and isotopic analyses identified imported metals from multiple locations, while discussions of potential indigenous metal production are also presented.

**Bria, Rebecca (University of Texas, San Antonio)****[61]***Discussant***[61]***Chair*

**Bria, Rebecca (University of Texas, San Antonio) and Brian McCray (Arizona State University)**  
[19]

*Scale, Interaction, and Society: Constituting Social Boundaries in the Northern Peruvian Andes*

Archaeologists often look to certain practices, such as interregional trade, local feasting, or inter-community warfare, as having defined different kinds of social boundaries—between corporate groups, communities, polities, ethnicities, or regions. Tom Dillehay's interdisciplinary work on a variety of Andean societies, from Chile to Peru, reveals how studies that consider interaction at multiple scales expose a more complex picture, such as how specific practices can define multiple social boundaries and identities simultaneously or how interaction involves negotiation between diverse social actors in multiple contexts. In this paper, we draw from Tom Dillehay's work to examine the materials, practices, and scales of interaction that constituted social boundaries in two Andean case studies: Wimba, a settlement in the ceja de montaña of Amazonas, Peru (1000–1532 CE) and Hualcayán, a highland community in the Cordillera Blanca of Ancash, Peru (2400 BCE–1450 CE). At Wimba, gatherings involved ceramics and portable adornments that indexed porous social boundaries with lowland Amazonian groups. At Hualcayán, materials originating from multiple scales of trade, agriculture, and ritual reflect the ways inhabitants' practices connected them to the wider Recuay world while also maintaining autonomy. Together, these case studies reveal how multiscale interaction connected community practices to larger regional processes.

Bria, Rebecca [9] see Oliver, Kalei

**Bridges, Andrea (Indiana University, NAGPRA)**  
[124]

*NAGPRA Education in Graduate Programs: The Jobs Are There, Where Is the Training?*

Since the passing of NAGPRA in 1990, a potential new subfield of jobs has emerged for bioarchaeologists and archaeologists who are invested in the repatriation process of Indigenous ancestral remains and sacred belongings. It has been 32 years since the law was passed, and NAGPRA job vacancies at federally funded institutions are still widely prevalent today. However, many graduate programs throughout the United States with applied anthropological foci are not offering relevant courses and training for graduate students who wish to seek careers in NAGPRA work. While the goal of applied anthropology programs is to prepare students for solving real-world problems using rigorous anthropological research and theory, many of these programs neglect to address essential skills needed for conducting NAGPRA work: ethical practices when handling human remains from Indigenous communities and community collaboration and consultation during the repatriation process. This poster explores the rates in which these topics are integrated into the curriculum of graduate, applied anthropology programs in the United States. This research also highlights the importance of training graduate students in consultation, repatriation, and ethics regarding human remains so they are best prepared to serve Indigenous communities in future NAGPRA positions.

Brielle, Esther [58] see Sedig, Jakob

**Briggs, Emily (University of Minnesota), Xinyuan Zheng (University of Minnesota) and John Berini (University of Minnesota)**  
[175]

*Establishing Cultural Affiliation under NAGPRA Using Geographic Origin: A Case Study of Minnesota*

Indigenous perspectives of cultural affiliation center on shared relationships with the land (Bruchac 2005); thus, establishing cultural affiliation under NAGPRA is more meaningful if it can reassociate an ancestor based on their region of origin. Biological relatedness has been used to establish cultural affiliation, but this approach prioritizes a western perspective of cultural belonging. It is also poorly suited to account for earlier histories of migration, intergroup mixing, and group fissions that are sometimes reported in oral traditions, and therefore cultural affiliation estimates based solely on biological relatedness may be inaccurate (Schillaci and Bustard 2010). My research aims to develop a resource for estimating an ancestor's geographic origin

using previously established geochemical methodologies and linear mixed effects modeling to estimate baseline strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) and oxygen ( $\delta^{18}\text{O}$ ) across Minnesota. Model efficacy will be evaluated based on its ability to accurately assign geographic origin to archaeological faunal remains of known provenance. If Indigenous stakeholders are interested in using this resource for reassociating an ancestor,  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $\delta^{18}\text{O}$  preserved within an ancestor's skeletal remains can be compared with baseline  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $\delta^{18}\text{O}$  to estimate their provenance. This resource centers in Minnesota but can serve as a model for repatriation efforts in other locations.

**Briggs, Rachel (University of North Carolina, Chapel Hill) and Heather Lapham (University of North Carolina, Chapel Hill)**

[128]

*Native Eastern Woodland Edible Metaphors of Pig and Bear*

Domestic pigs, first introduced to sixteenth-century Native Americans in the Southeast by Spanish entradas, provided a familiar and suitably European food source for colonists who settled the region. Over the next two to three centuries, local Indigenous cuisines also incorporated pig meat and fat, which often fulfilled the same culinary roles once occupied by black bear (a species endemic to much of North America). To understand this incorporation, we consider the metaphoric qualities of pigs and bears and their perceived similarities and differences along culinary, social, and ritual lines among Indigenous Eastern Woodland groups.

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

[58]

*The Art of Interconnection: Chichen Itza and the Gulf Coast*

We often talk about the connections between Chichen Itza and Tula, but these two great cities were far from alone in the ancient Mesoamerican world. In this presentation, I will explore artistic and architectural similarities between Chichen Itza and the Gulf Coast, from the iconography of ball game sacrifice to the presence of round columns carved with narrative scenes. What emerges is the possibility of multiple modes of contact between the Yucatán Peninsula and the Gulf Coast region, a history of mutual influence spanning centuries.

Britton, Emma [166] see Welch, John

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

[16]

*Chair*

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

[16]

*Memories of Disaster and Monumental Places in the Callejon de Huaylas, Peru*

In 1970, a 7.9 magnitude earthquake destroyed numerous towns and displaced many families throughout the Callejon de Huaylas, Peru. In the search for new land and new lives, many of the displaced families began to settle on elevated archaeological sites of monumental architecture located in alluvial plains and near urban centers throughout the region. Despite the active and dynamic landscape of the Callejon de Huaylas, fraught with landslides, earthquakes, and glacial lake outburst floods (GLOFS), these monumental places currently occupied by present-day communities have existed as enduring and continually occupied places on the landscape since the third millennium BCE. This paper combines preliminary paleoclimate and geoarchaeological data to situate the emergence and vitality of early Andean highland monuments (3000–2100 BCE) in an ecological environment that is constantly transforming through time. Combined with this analysis, oral history and ethnohistoric data create relevant links between present-day understandings of environmental risk, monumentality, and place making and the archaeological past.

**Brooks, Alison (George Washington University)****[88]***Discussant***Brooks, Alison (George Washington University), Joshua Porter (University of Arkansas) and John Yellen (National Science Foundation)****[212]***Core Variability in the Middle Stone Age of East Africa*

Harold Dibble made major contributions to the study of cores and their relation to flake morphology. Other experimental studies have shown that repeated core morphologies may be the result of a complex series of learned steps, which are culturally transmitted (e.g., K. L. Ranhorn, PhD dissertation, George Washington University, 2017; Ranhorn et al., *Evol. Anthro.* 29:53–55; Stout et al., *Curr. Anthro.* 60:305–340, 2019), although other factors such as raw material form or qualities are also important (e.g., Tryon and Ranhorn, in H. Groucutt, ed., *Culture History and Convergent Evolution*, pp. 305–340, Springer, 2020). Here we present a comparative study of core variation in the Middle Stone Age of East Africa, between >320 ka and <105 ka in multiple raw materials. We focus especially on cores from the early MSA at Olorgesailie (Southern Kenya Rift) and cores from the later MSA at Aduma, (Middle Awash Valley, Ethiopia). We also discuss approaches to characterizing core variation including attributes introduced by Dibble.

**Brooks, Allyson (Washington Department of Archaeology and Historic Preservation)****[4]***Discussant***Brooks, James (University of Georgia) and Catherine Cameron (University of Colorado, Boulder)****[24]***Comparative Multiethnic Predation in Borderland Context*

The 1847–1848 US annexation of northern Mexico is often referred to as a “bloodless conquest,” in that there was no organized military defense. Yet we see dozens of small-scale guerilla actions by units of mixed-ethnic attribution against Americans. Observers noted that their “Mexican” opponents included Pueblo, Ute, and Apache Indians, as well as “half-breeds” known locally as *genizaros*. Prominent among the latter reference was a mysterious fighter Manuel Cortés, who led “two or three hundred Mexicans, and a large party of Indians” in lightning raids. As raiders like Cortés waged hit-and-run wars against the intruding Americans, the Comanche engaged in similar raiding. Attacking pueblos, the Apache, and settlers in northern Mexico, they gathered multitudes of horses and captives. Yet their ethnic composition resembled that of Cortés, in that as much as one-third of the Comanches were Mexicans captured in childhood. Comanches developed a complex relationship with the Northern Frontier of Mexico, raiding at times but also attending trade fairs in Taos and Pecos. This paper explores the phenomena of Cortés’s and similar units as militarized social groups that dwelt and prospered midway between the Indigenous and the colonial, and midway between stateless landscapes and formal nation states.

**Broomandkhoshbacht, Nasreen (University of California, Santa Cruz), Lars Fehren-Schmitz (University of California, Santa Cruz), Lucy Salazar (Yale University), Richard Burger (Yale University) and Elizabeth Nelson (Institut Pasteur, Paris)****[102]***Contact-Era Tuberculosis at Kanamarka, Peru*

Kanamarka, a Peruvian highland site approximately 150 km south of Cusco, contains an early colonial-era churchyard. In use from approximately 1530–1580 CE, this cemetery is the likely resting place of contact-era disease victims. The *Mycobacterium tuberculosis* complex (MTBC), a phylogeographically dispersed group of deadly pathogens, existed in South America long before the arrival of European colonizers, albeit a different

species from the one in Europe. *M. pinnipedii*, known to infect modern seals and sea lions, appears to have infected human populations in the prehispanic Andes but has since been replaced by the European lineage of TB (L4). Using metagenomic methods to analyze single-stranded libraries, we recovered MTBC DNA in 15 individuals from Kanamarka's churchyard, providing insight into Andean MTBC in the colonial era. Our findings illuminate the biocultural and molecular mechanisms that contributed to the replacement of *M. pinnipedii*. We offer a retrospective view of the dynamic nature of infectious diseases within contexts of sociopolitical and cultural transitions, both known to impact modern-day tuberculosis. In collaboration with community members, these results will be interpreted as part of a larger project and used to enrich local educational units and museum displays. This poster contains no images of human remains.

Broughton, Jack [198] see Byers, David

Broughton, Jack [97] see Cole, Kasey

Brousseau, Chantal [55] see Walsh, Justin

**Brouwer Burg, Marieka (University of Vermont), Eleanor Harrison-Buck (University of New Hampshire) and Samantha Krause (Texas State University)**  
[17]

*Problematizing Past Human-Landscape Interactions in the Lower Belize River Watershed: An Interdisciplinary Approach*

There are many persistent issues that hamper archaeological interpretations of human-landscape interactions, from modern-day disturbances to more distant postdepositional processes and changing environmental conditions. These circumstances often make it a challenge to tease out cultural behaviors and the resulting material correlates of past human activity. Geoarchaeological inputs—utilizing a variety of interdisciplinary bodies of knowledge, technologies, and applications—are playing a key role in alleviating some of these issues. Ongoing research collaboration between archaeologists and geoarchaeologists in the Lower Belize River Watershed is following an interdisciplinary path blazed by Tim Beach. Our research has revealed a complex mosaic of diverse microenvironments—from wetlands to pine savanna—that show evidence of intensive management from Preceramic times onward. Here, we discuss how soil studies and the collection of paleoenvironmental and paleoclimatic proxy data are enhancing our archaeological reconstructions and our understanding of the paleolandscape. We outline some of the key issues facing archaeological research in Belize and how integrated archaeological and geological research design and project implementation can lead to broader and richer understandings of past human-environment interactions. These findings are critical as we continue to investigate this area of Mesoamerica from multiple temporal and spatial scales.

Brouwer Burg, Marieka [115] see Tibbits, Tawny

Brown, Andy [95] see Schirmer, Ronald

Brown, Christopher [214] see Stemp, W. James

**Brown, Clifford (Florida Atlantic University), Hector Neff (California State University), Michael Glascock (University of Missouri Research Reactor), Sofia Feliciano (Florida Atlantic University) and Andrew Terentis (Florida Atlantic University)**  
[17]

*Geochemistry and Provenance of Late Formative Pottery from Chinandega, Nicaragua*

We describe the Cosigüina ceramic complex from the coastal plain of the Department of Chinandega,

Nicaragua. It dates from the Late Formative. We assign it stylistically to the Providencia-Miraflores ceramic spheres of western El Salvador and southeastern Guatemala. We used instrumental neutron activation analysis to obtain elemental compositional data for 197 potsherds, including presumably local utilitarian types. Statistical analysis of the resulting elemental concentrations indicated that the specimens fall into three compositional groups, with seven sherds remaining unassigned. We interpret two of the groups as having been manufactured locally because they contain the majority of specimens ( $n = 177$ ), including the utilitarian types, and exhibit similarities to the documented geochemistry of the area. The third group ( $n = 13$ , or 6.6% of the original sample) appears nonlocal not only because it is distinct from the other two but also because it shares similarities in chemical composition with contemporaneous pottery from western El Salvador and southeastern Guatemala; for example, the concentrations of Th and La. We argue that this group was imported from western El Salvador and southeastern Guatemala, indicating direct contact between that region and Chinandega. Raman spectroscopy revealed the composition of purple paint applied to Olocuitla Orange.

Brown, David [54] see Pratt, Will

**Brown, Jesse**

[147]

*Reconstructing the Habitual Workspaces of a Middle Caddo Period Structure at Site 41FN244*

The Bois d'Arc Lake archaeological project was carried out by AR Consultants in coordination with the Caddo Nation of Oklahoma, the Texas Historical Commission, and the Tulsa District of US Army Corps of Engineers. These investigations were to determine the National Register eligibility of Site 41FN244. Funded by the North Texas Municipal Water District, mitigation efforts to test the integrity of the material remains of site 41FN244 identified seven Activity Areas across a terrace overlooking the Bois d'Arc Creek. Block excavations of Activity Area 3 identified and recovered cultural materials associated with a potential house structure dating between AD 1300 and 1580. The spatial patterning of bifacial, flake, and ground stone artifacts found within this domestic space appears to reflect a culturally specific, repeated tool manufacture and maintenance events that reflect habitual workspaces. My research aims to reconstruct the organization of household activities by identifying the habitual workspaces commonly used within the domestic spaces of the structure.

**Brown, Kaitlin (University of California, Santa Cruz), Brian Barbier (Santa Barbara Museum of Natural History) and Gina Mosqueda-Lucas (Santa Ynez Band of Chumash Indians)**

[10]

*The Reorganization of Shell Bead Production in California during the Historic Period*

This paper explores *Olivella* shell money bead production among the Chumash during the Mission period in south-central California. An extensive examination of bead-making detritus recovered during recent archaeological excavations at Mission La Purisima Concepcion yielded insight into this extensive industry that flourished in the early nineteenth century. We argue that the main economic hubs for bead manufacturing and distribution moved from the California Channel Islands to mission centers, creating a shift in Indigenous economic systems. While Chumash elites and other "big men" monopolized the manufacturing of shell beads before the Spanish mission period, new Native communities that formed mission towns employed more of a free market, thus affecting the quality and production of shell money beads later in time.

**Brown, M. Kathryn (University of Texas, San Antonio), Jennifer Cochran (Perennial Environmental Services) and Rachel Horowitz (Washington State University)**

[129]

*Middle Preclassic Marine Shell Production and Ritual Deposition at the Sites of Blackman Eddy and Las Ruinas de Arenal, Belize*

Marine shell was a highly valued long-distance trade material for the ancient Maya beginning as early as the Middle Preclassic. Symbolically, marine shell represented the watery underworld and was often used in ritual offerings that reference cosmological ordering of the world. Evidence for Middle Preclassic marine shell bead production, predominately using *Strombus*, has been identified at several sites in the Belize River valley including Pacbitun, Blackman Eddy, and Cahal Pech. Ritual deposition of marine shell has also been widely documented in the Middle Preclassic in a variety of offerings in both public and private spaces. In this paper we compare Middle Preclassic marine shell production and use at the sites of Blackman Eddy and Las Ruinas de Arenal in order to better understand patterns of purposeful symbolic deposition. At Blackman Eddy, marine shell production debitage was used in ritual deposits, while at Las Ruinas de Arenal, marine shell beads were preferred for ritual offerings. We suggest that economic factors may have contributed to these differences but that the underlying symbolism and cosmological references to the underworld were consistent at both sites.

Brown, M. Kathryn [165] see Cap, Bernadette

**Brown, Marley**  
[234]

*Advocacy for Archaeology: How Does a 35-Year Effort End Up in Failure and What to Do about It?*

Thirty-five years of very active advocacy of the importance of the archaeological record of Bermuda, England's second and oldest continuing New World colony, has had little or no effect. Unlike many places in the world, which have embraced the scholarly significance of historical archaeology only within the past two decades, Bermuda continues to ignore what remains of a remarkable terrestrial archaeological heritage. In part the result of a deserved emphasis on underwater archaeology, the lack of preservation of terrestrial archaeological sites reflects a combination of political factors on the island, Chief among these is the continuing conflict between two narratives—that evidence of the first permanent English settlement and its surviving World Heritage legacy should be the focus of attention, versus the argument that the importance of heritage should be to illustrate the crippling effects of enslavement on the majority of Bermuda's population. The single active archaeological project on Bermuda examines the former; there are no projects currently examining the latter. Prior research since 1988, however, has produced much archaeological evidence that can be reanalyzed and productively employed to address this conflict in heritage values on Bermuda and potentially lead to a concerted program of archaeological preservation.

**Brown, Matthew (University of Michigan)**  
[224]  
*Chair*

**Brown, Matthew (University of Michigan)**  
[224]

*Muyumoqo: Preliminary Results from a Late Formative (400 BCE–200 CE) Site in the Chitapampa Basin, Cusco, Peru*

This paper presents preliminary results from excavations at the Formative (2200 BCE–200 CE) site of Muyumoqo in the Chitapampa Basin, Cusco, Peru. A systematic survey of the Cusco Basin and surrounding regions raised several questions about Muyumoqo's role in the local economy and its relation to polities forming during the Late Formative. Results from the survey suggested that Muyumoqo may have been a domestic sector occupied by local elites with a ritual site located across from the site at Raqchi. The Chitapampa area saw a large shift in settlement during the Early Intermediate (200–600 CE) with Muyumoqo and other large sites being abandoned. It was suggested this resettlement was in response to the growth of a non-state polity in the Cusco Basin. Data from excavations of households and surface collection of the site are presented. An initial analysis of pottery from these households detected the presence of potential EIP styles necessitating a reevaluation of Muyumoqo's relationship with its neighbors in the Cusco Basin.

**Brown, Megan and Bonnie Clark****[30]***Early Childhood and Agency: An Archaeological Analysis of Residential Blocks with Preschools at the Granada Relocation Center (Amache)*

The purpose of this project is to continue to expand upon the understanding of experiences of Japanese American children, specifically preschool-aged children, within The Granada Relocation Center (Amache), a WWII Japanese American internment facility located in Granada, Colorado. Through archaeological methods, GIS analysis, oral histories, and archival research, I will analyze the landscape and material culture of the five residential blocks within Amache that had designated preschools. I will then compare these blocks with preschools to residential blocks without preschools to determine if there are any patterns and discernable differences between the two study areas. The findings of this research will provide insight into how young children left a discernable impression on the site through their agency in the community as a whole.

**Brown, Thomas (WillametteCRA)****[107]***Discussant***Brown, Thomas (WillametteCRA)****[92]***The Effect of Boats and Watercraft on Archaeological Interpretations of Social/Economic Organization and Population Histories within the Pacific Northwest of North America*

The use or increased use of boats fundamentally alters people's relationship to their landscape. However, how boats alter this relationship is not always straightforward or consistent. For example, increased use or improvements in boating technologies has been variously argued to extend, contract, and/or lead to an intensification of resources within a group's territorial radius. Using archaeological and ethnographic examples from the Pacific Northwest of North America, it is suggested here that regardless of whether boats lead to an increase or contraction in the aerial extent of a group's territory, they likely lead to more focal settlement patterns, with emphasis on fewer locations, leading to more discretely clustered sizes and types of sites. The implications of this on how archaeologists interpret proxies for population and social and economic organization are discussed.

Brown, Thomas [113] see Letham, Bryn

Brown, Zachary [104] see Badillo, Alex

Brubaker, Roy [18] see Owen, Ross

Bruch, Angela [56] see Jarl, Johan

Bruch, Angela [56] see Kandel, Andrew

**Bruck, Seth (San Diego State University), Todd Braje (San Diego State University), Torben Rick (National Museum of Natural History), Emma Elliott Smith (National Museum of Natural History) and Lain Graham (National Museum of Natural History)****[71]***Zooarchaeological Investigations of a Cultural Keystone Place at Point Conception, Southern California*

On the southern California coast, Point Conception is highly significant for Chumash peoples and demarcates a critical location of ecological diversity. At this location, the coastline abruptly shifts from a north-south to east-west trending shoreline and marks the ecological convergence of colder northern and warmer southern

waters, a biogeographic dividing point for many marine organisms. Point Conception or Kumqaq' has been a cultural keystone place for the Chumash for millennia, but there are few systematic archaeological investigations of this critical land and seascape. Here, we report on zooarchaeological analysis of a column sample excavated from CA-SBA-4194, a Late period logistical foraging campsite on the Point Conception sea cliff. Our findings offer the first detailed look into the foraging activities, lifeways, and ecological conditions at Kumqaq' in the centuries immediately prior to Spanish contact.

Brunelle Runburg, Andrea [121] see Bommarito, Savannah  
 Brunelle Runburg, Andrea [180] see DeGraffenried, Jennifer  
 Brunelle Runburg, Andrea [74] see Hart, Isaac

Bruner, David [117] see Castro, Mark

**Brunette, Jeremy (Los Alamos National Laboratory) and Jonathan Stark (Los Alamos National Laboratory)**

[30]

*Revisiting the Sentinels: An Analysis of Data Recovery Potential from the Razed Manhattan Project Built Environment, Los Alamos National Laboratory, New Mexico*

Twenty years ago, cultural resource managers produced a multiple-property evaluation of extant Manhattan Project properties at Los Alamos National Laboratory titled *Sentinels of the Atomic Dawn*. *Sentinels* recorded 49 standing buildings and two archaeological sites. Since that initial evaluation, 29 of the 49 buildings have been demolished and the two archaeological sites have experienced significant deterioration. The 29 razed buildings now make up a scattering of archaeological sites, seven of which have been inventoried and evaluated for eligibility for listing in the National Register of Historic Places, leaving a considerable number of former building locations to investigate. Cultural resource managers with Los Alamos National Laboratory performed archaeological surveys at several razed Manhattan Project-era building sites. These investigations aimed to examine research potential for razed building sites and showed that artifacts associated with Manhattan Project activities are still present. While the integrity of these sites is greatly diminished, detectable archaeological data verifies historical significance and adds to our understanding of Los Alamos during World War II and the early Cold War. This poster will describe the results of these preliminary investigations into the research potential of a razed built environment at a secret wartime laboratory in northern New Mexico.

**Brunso, Karen (Chickasaw Nation)**

[1]

*Discussant*

**Brunson, Katherine (Wesleyan University), Kelsey Witt (Brown University), Sloan Williams (University of Illinois, Chicago), Susan Monge (University of Illinois, Chicago) and Lisa Janz (University of Toronto)**

[244]

*Ancient Mongolian Aurochs Genomes Reveal Connections to East Asian Cattle*

Societies in East Asia have utilized domesticated cattle since approximately 5,000 years ago, but the origins of East Asian cattle remain understudied. Possible experimentation with management of wild aurochs (*Bos primigenius*) and other bovids has been hypothesized but not explored in detail. Here, we present newly sequenced genomes of ancient Mongolian aurochs from Tamsagbulag and Zaraa Uul. We explore bovine population dynamics through comparison with the genomes of ancient and modern domestic and wild bovine populations in Eurasia. Ancient Chinese cattle from the Bronze Age site of Shimao show evidence for gene flow from Mongolian aurochs, but this ancestry signal is lost in modern East Asian cattle. Mongolian aurochs

ancestry appears distinct from aurochs in West Eurasia and from isolated native Japanese cattle breeds. We also discuss the evidence for human management of aurochs populations in East Asia.

Bryan, Taylor [174] see Johnston, Cheryl

Bryce, William [180] see Terlep, Michael

**Brzezinski, Jeffrey (University of Colorado, Boulder)**

[146]

*Reconsidering Time, Matter, and Community in the Monumental Architecture of Coastal Oaxaca, Mexico*

Archaeologists are keenly aware that the past, present, and future are always being reworked, always in motion: a composite weave of multiple temporalities. One of the enduring challenges of our discipline is to tease out of the seemingly static archaeological record how people in the past conceptualized, materialized, and experienced time. In this paper, I analyze time as it manifested in the lives of people in the lower Río Verde Valley of Oaxaca, Mexico, from the Late Formative to the Late Classic periods (ca. 400 BCE–900 CE). I employ a New Materialist theoretical framework to pay particular attention to the way that objects, materials, and their properties did the work of enfolding time and assembling history in the region's monumental architecture. This perspective offers a novel way to reconsider relational ontologies as assemblages of people, things, places, and ideas that not only exist in time but also make time.

Buchanan, Brian [106] see Hanscam, Emily

**Buchanan, Briggs (University of Tulsa) and Mark Collard (Simon Fraser University)**

[45]

*Documenting Cultural Innovation, Adoption, and Stability among the Southern Athapaskans*

The migration of Athapaskan (alternatively, Athabaskan or Na-Dene) groups from the Subarctic regions of northwestern Canada and Alaska to the American Southwest is one of the longest and best documented movements of Indigenous peoples in the Americas. The starkly different environment of the Southwest and the subsequent interactions with Southwest peoples that had been living in the region for millennia, have made this migration a focus for anthropologists interested in the effects of environment and interaction on cultural practices and language. In our study, we used a large dataset of cultural traits compiled by anthropologists to investigate cultural change. We compared the cultural traits of Southern Athapaskan peoples with those of Northern Athapaskans and unrelated Southwest peoples. Our analysis showed that social and kinship organization, subsistence economy, and technology had the highest number of cultural traits that differed from the Northern Athapaskans. However, the technology suite of cultural traits had the highest number of new cultural traits that could also be found in adjacent non-Athapaskan groups in the region. Cultural traits related to the spiritual quest had the highest rate of innovation. We discuss the implications of these results for the study of cultural evolution and the archaeological record.

**Buchler, Justine (Flinders University)**

[197]

*Chair*

**Buchler, Justine (Flinders University)**

[197]

*The Use of Marine Magnetism to Study Submerged Archaeological Deposits in Shallow Water*

Marine geophysics has been increasingly used to identify and study submerged landscapes and the archaeology

thereof. Techniques such as side-scan sonar and sub-bottom profiling have been used to locate submerged archaeological deposits. Marine magnetics offer another method that can be used in the study of submerged landscapes. Marine magnetics have been used successfully to identify many shipwreck sites. The success of these studies is based on the scale of the target, high magnetic intensity, preferential preservation, and location of submerged historic metallic objects; however, the use of magnetics is not limited to the study of shipwrecks. The utility and success of magnetics in the study of submerged landscapes is increasing based on the nature of archaeological deposits, site formation processes involving extreme heat or the displacement of sediment and soils, and the increased sensitivity of equipment used. This poster presents preliminary research into the use of marine magnetics to survey, identify, and differentiate potential archaeological features on submerged landscapes in shallow water (<15 m) based on changes in magnetic values.

**Buckley, Gina (University of Missouri Research Reactor)**

[3]

*Chair*

**Buckley, Gina (University of Missouri Research Reactor), Sergio Gómez Chávez (Instituto Nacional de Antropología e Historia), Ruben Cabrera Castro (Instituto Nacional de Antropología e Historia), Fred Longstaffe (University of Western Ontario) and Spencer Seman (Pennsylvania State University)**

[3]

*New Isotopic Research from the La Ventilla Neighborhood of Teotihuacan: Demography, Migration, and Diet of Two Socioeconomic Groups*

The neighborhood of La Ventilla in the city of Teotihuacan was extensively excavated in the 1990s, during which the largest skeletal collection was recovered at this great urban center. However, it was not until the last several years that stable and radiogenic isotope analysis were conducted on a large-scale at this site. New strontium and oxygen isotope data of almost 100 individuals will be presented. Results are coupled with radiocarbon dates to identify diachronic migration patterns along with stable carbon and nitrogen isotopes to observe dietary practices. From these data, demographic and health trends among this population will be discussed. Finally, current and planned future work on a strontium isoscape of Mexico will be presented, an important avenue for advancing migration studies in Mesoamerica.

Buckley, Gina [3] see Rankle, Chad

Buckley, Michael [70] see LeFebvre, Michelle

Buckley, Michael [240] see Morin, Eugene

Buckley, Michael [218] see Pothier-Bouchard, Geneviève

**Buckner, Paul (HDR)**

[150]

*Chair*

**Buckner, Paul (HDR)**

[150]

*Over the Hills and Far Away: Evaluating Competing Models for Early Ceramic Period Mobility in the Southern Rocky Mountains*

The transition from the Late Archaic (1200 BC–AD 150) to the Early Ceramic (AD 150–1150) in northern Colorado and southern Wyoming is characterized by decreasing mobility, a trend reflected by the adoption of ceramic technology, limited stone architecture, and longer site occupation. Contrasted against this shift to longer occupations is concurrent evidence for increased seasonal transhumance between the Colorado

Piedmont and Rocky Mountain foothills, intermountain parks, and high mountains. Though multiple models have been proposed to explain these patterns, the best known is the rotary system first proposed by Benedict (1992), which examined lithic raw material conveyance from lowland and upland sources to reconstruct an extensive seasonal round covering hundreds of miles across the Colorado Front Range and Medicine Bow Mountains. To clarify the role of these mobility strategies in a period of emerging sedentism, this study employs a GIS-based least cost paths analysis, ethnographic analogy, and theoretical perspectives on forager mobility to assess competing models for Early Ceramic transhumance. Examination of Early Ceramic mobility allows better understanding of the seeming contradictions in a system defined by seasonal mobility both greater and lesser than the previous Late Archaic period.

**Buckser, Sasha (University of Colorado, Boulder)**

[118]

*Chair*

**Buckser, Sasha (University of Colorado, Boulder), William Taylor (University of Colorado, Boulder), Karissa Hughes (University of Oklahoma), Fernando Villanea (University of Colorado, Boulder) and Courtney Hofman (University of Oklahoma)**

[118]

*Exploring Early Historic Human-Canid Relationships in the Intermountain West: A Case Study from Seventeenth-Century Blacks Fork, Wyoming*

Relationships among people, dogs, and wild canid taxa played important cultural and functional roles in the early Great Plains and Rocky Mountains. However, the complexity of human-canid relationships in precolonial America and morphological similarities among wild and domestic canids make tracing human-canid interaction through the archaeological record challenging. The Blacks Fork, WY, site dates to the mid-seventeenth century, and includes a juvenile domestic horse in association with three canid skulls displaying morphological features of both dogs and coyotes. To identify these canids' species and explore their possible relationships with humans, I applied a range of techniques from the archaeological and bio-molecular sciences, including osteological study and mtDNA sequencing. Results suggest the Blacks Fork canids were coyotes interacting minimally with humans beyond their death and butchery. Comparing the Blacks Fork canids with canid remains from sites across western America suggests archaeological coyotes exhibit distinct treatments from archaeological dog remains in Native archaeological contexts, and that the interment of the coyotes at Blacks Fork likely served ceremonial purposes. The Blacks Fork canids underscore the cultural significance of coyotes in the intermountain West and illuminate the intersection of new and existing systems of human-animal relationships during the introduction of domestic horses.

**Budner, Hannah (Hamilton College), Lacey Carpenter (Hamilton College), Hannah Lau (Colgate University) and Colin Quinn (Hamilton College)**

[101]

*History of Home Health Care: Shifting Practices of Hygiene, Wellness, and Medicine in Eighteenth- to Nineteenth-Century Central New York*

In the early colonial context of the eighteenth and nineteenth centuries in the United States, understanding wellness practices include a dynamic view of what constitutes medicine, personal hygiene, and healthcare. At this time, European colonizers arrived in central New York, occupying traditional Oneida Land, and brought with them their views on wellness. These views changed through a process of getting to know a new environment and through the emergence of capitalism. Advertising and the formalization of the medical industry helped create and reinforce broader norms of wellness. However, how people experienced this in their daily lives is sometimes at odds with these broader social norms. Archaeologists can reconstruct how people practice wellness in their daily lives by examining house architecture, waste disposal patterns, and material culture associated with healthcare products. In this poster, we present the results of the analysis of material culture associated with health, wellness, and personal hygiene from the Reuben Long house in central New York. We contextualize these objects within a broader assessment of the changing norms and

health outcomes in Oneida County. These insights help us understand the deep history of tensions between daily life and social norms associated with health and wellness.

**Budziszewski, Adam (University of Warsaw) and Alfonso Gastelum-Strozzi (Universidad Nacional Autónoma de México)**

[200]

*Spoiler Alert: Bioarchaeological Study of Cremation Funerary Urns with an Application of Computer Tomography*  
Nine urns from the early Postclassic cemetery in Los Tamarindos (Tierra Caliente, Michoacán, Mexico) containing human cremains have been excavated with the support of a CT scan. Selected examples from this sample will be presented to demonstrate the analytical potential of the methodology that merges bioarchaeological analysis of human cremains and computer tomography, which demonstrates the spatial distribution of archaeological and osteological material within the funerary urn prior to the exploration of the urn fill. Computer tomography proved to be essential for micro-excavation process planning. Moreover, it allowed us to improve the decision-making process of division of exploration layers to study and improve our understanding of the spatial distribution of osteological material within the urn. Moreover, the CT scan provides valuable information about the pre-excavation distribution of archaeological material such as pottery and grave goods, which can be essential in reconstructing the urn fill formation process. Finally, CT scans can enhance the transparency of studies involving cremation urn burials, providing important graphic documentation, allowing us to present and prove the observed patterns in the spatial distribution of osteological material. In this study, we will also address the most significant limitations of the applied methodology.

Bueno, Lucas [46] see Bond Reis, Lucas

**Buffa, Danielle (Penn State), George Manahira (Morombe Archaeological Project), Zafy Maharesy Chrisostome (Morombe Archaeological Project), Felicia Fenomanana (Morombe Archaeological Project) and Kristina Douglass (The Climate School, Columbia University)**

[133]

*Adorning Localities: An Investigation of Shell Beads in Holocene Southwestern Madagascar*

In African and Indo-Pacific contexts, beads play a significant role in the maintenance of social and economic networks across long distances. In modern continental African contexts, these networks are argued to represent delayed reciprocity, with beads acting as a currency to secure the relationship between distant gifting partners. However, archaeological studies have tended to focus on the oldest contexts, colonization era glass beads, and imports. As such, the function and typology of mid-late Holocene African shell beads have received less attention. Here we present an assemblage of whole shell and disc beads from 18 archaeological sites within Velondriake Marine Protected Area of southwest Madagascar, an island whose Indigenous bead traditions remain critically understudied. This project seeks to understand: 1) the range of taxa used to make shell beads, 2) the ecologies of exploited taxa, and 3) how beads were created, used, and traded. We approach these topics using a *chaîne opératoire* framework.

**Buffington, Abigail (William & Mary), Smiti Nathan (Johns Hopkins University) and Mary Lawrence Young (William & Mary)**

[77]

*Testing Theoretical Approaches for the Composition of Charcoal Assemblages*

Archaeologists use charcoal assemblages principally to reconstruct chronologies and past vegetative landscapes, especially when sampled from long-used refuse features, though human decision-making plays a role in the construction of these assemblages. In this paper, we will gather together a dataset reflecting an unpublished dataset from three sites in the Wadi ar-Raki region of northern Oman, as well as eight published charcoal assemblages from the greater Gulf region. The assemblages originate from sites dating as early as the Neolithic era (i.e., 6000–3000 cal BCE) into the Late Sasanian and Early Islamic (fifth to eighth century CE) periods.

Commonly, anthracologists test for the Principle of Least Effort (PLE) in operation in wood harvesting (targeting wood for collection based on its position as a common resource in the environment), owing to the frequency of collection. We will compare this model (which we term the null) against a human behavioral ecology model for selecting woods based on their fuel efficiency, and an avoidance model based on ethnographic data gathered from Arabian ethnobotanical research. The intent is for these results to reveal possible wood acquisition strategies utilized in the area and offer insight into shifts in species preference over time.

**Bugarin, Flordeliz (Howard University)**

[138]

*The Contributions of Archaeology to the Story of the African World*

Archaeology has much to offer Black Studies, and in turn, Black Studies has much to offer the archaeology of Africa and the African diaspora. In concert, these fields of inquiry hold the potential to enhance our understanding of history and culture in the African world and uplift archaeology as a field that is more relevant to contemporary concerns. As such, our derived insights, new questions, and interpretations can serve as tools of social justice, frameworks for counternarratives and histories, and foundations for more holistic explanations. A closer look at two archaeological sites, Kunta Kinteh Island in The Gambia, West Africa, and Nicodemus, Kansas, USA, can shed light on the benefits of a deeper engagement between Black historical and contemporary studies, social activism, and archaeological questions and data.

Buikstra, Jane [205] see Cerezo-Román, Jessica

Buikstra, Jane [162] see Rothwell, Jessica

Buikstra, Jane [28] see Schach, Emily

Bulhusen Muñoz, Karim [71] see Jazwa, Christopher

Bull, Ian [235] see Blong, John

Bullard, Thomas [94] see Stoner, Edward

**Bullen, Jonah (University of Tennessee)**

[199]

*A Comparative Paleoethnobotanical Analysis of Geographically Disparate Salado Sites*

In the thirteenth century, the southwestern United States underwent extensive demographic shifts, including migration and drastic social upheaval. From this context what archaeologists call the Salado ideology emerged in southern Arizona and southwestern New Mexico in the fourteenth century from the interactions of Kayenta migrants and those occupying the regions in which they settled. Although much of what is known of the Salado world is linked to ceramics, extensive paleoethnobotanical datasets exist from regions such as the Gila River Valley, Mimbres Valley, and Tonto Basin. Through the comparison of paleoethnobotanical assemblages from geographically disparate Salado sites, I examine economic and subsistence differences between regions and explore the resulting patterns to identify factors contributing to interregional variability.

**Bullion, Elissa (Oregon Legislative Commission on Indian Affairs [LCIS]), Farhad Maksudov (Uzbek Academy of Science, Institute of Archaeology) and Michael Frachetti (Washington University, St. Louis)**

[79]

*Urbanism in Western Medieval Central Asia: Dynastic Jewels and Dynamic Networks*

The ninth to thirteenth centuries in the western Eurasian steppe and Central Asia were a period of intensive urban growth. Cities such as Bukhara and Marv boasted large populations in the hundreds of thousands, were home to large communities of scientific and religious scholars, and were transformed by large-scale construction, commonly funded by the ruling dynasties. In addition to this intensive form of urbanism, this period saw the emergence of a smaller scale, extensive urbanism. This settlement pattern is expressed in small but dense sites located in proximity to raw material sources, and trade routes. As opposed to the large cities of this period, these communities are primarily located at sites that do not show evidence of previous permanent occupation, and appear to have been abandoned in the thirteenth century. This paper examines these two forms of urban settlement, and the economic and ideological underpinnings of their development. The medieval period saw the spread of Islam across Central Asia, and the florescence of market networks in materials from iron weapons to peaches. Here we present multidisciplinary evidence from burials, architecture, and botanical remains that shows how religion and trade encouraged the growth of these two types of urbanism.

Bullion, Elissa [141] see Dupuy, Paula

**Buonasera, Tammy (University of California, Davis; Far Western Anthropological Research Group), Jelmer Eerkens (University of California, Davis), Brian Byrd (Far Western Anthropological Research Group), Monica Arellano (Muwekma Ohlone Tribe of the San Francisco Bay Area) and Glendon Parker (University of California, Davis)**

[163]

*Sex-Biased Differences in Infant Mortality and Life Expectancy at Sii Túupentak, an Ancestral Ohlone Village in Central California (ca. 540–145 cal BP)*

Sii Túupentak (CA-SCA-565/H) is a late precontact ancestral Ohlone village/cemetery site in central California (ca. 540–145 cal BP). Integration of proteomic, genomic, and osteological analyses provided highly confident biological sex estimates for remains of most individuals at this site (65 of 76) spanning all age groups—from perinatal infants to aged adults. The comprehensive nature of this data allowed us to generate sex-specific Kaplan-Meier survivorship curves for this burial population of sedentary hunter-gatherers. As was common among societies predating modern Western medicine and antibiotics, infant mortality was high for both males and females at Sii Túupentak. However, male infants (from birth to five years of age) appear to have died at nearly twice the rate of female infants and had a mean age of survival at birth of only 19 years, versus 30 years for females. Compared to survival curves for other societies predating modern western medicine and antibiotics, this bias is larger than might be expected. We suspect the pattern of sex-biased infant mortality at Sii Túupentak could relate to an intrinsic survival advantage for female infants, combined with extrinsic factors such as environmental pathogens, nutritional stress, and gendered differences in weaning patterns detected through stable isotope analyses.

Buonasera, Tammy [27] see Butler, Caelie

Burbano, Hernan [20] see Swarts, Kelly

**Burdette, Mary (University of Illinois, Urbana-Champaign)**

[72]

*Native American Narratives in Museum Interpretation: Case Studies in Illinois*

Museums as institutions have a storied history regarding the presentation of Native American cultures and histories to the public. Much has been done to address this issue, although the topic remains difficult to explain succinctly to those without prior knowledge. Often, the interpretation of artifacts is oversimplified and leads to confusion or misunderstanding by museumgoers regarding cultural significance of sites or artifacts. This misunderstanding can be harmful for not only the visitor's education, but the institutions as well, as this can lead to the appearance of support of common cultural misunderstandings that continue to

proliferate in contemporary culture. I analyze a broad range of information presentation at various mound group sites in Illinois to explore interpretations of Native American cultures and how heritagization is reaffirmed or subverted in public education. I focus on the language used in the presentation of similar artifacts and the implications this has on the public's understandings of the topics at hand (e.g., subsistence, trade, etc.). This research provides insight into the public's understandings of information presented by institutions regarding Native American cultures to reevaluate public presentations for greater comprehension.

Burger, Richard [102] see Broomandkhoshbacht, Nasreen

Burger, Richard [59] see Kater, Thiago

**Burham, Melissa (University of Arizona) and Juan Manuel Palomo (Ceibal-Petexbatún Archaeological Project, Phase 2)**

[162]

*Mortuary Practice and Placemaking: The Establishment of a Cemetery during the Preceramic-Preclassic Transition at Ceibal, Guatemala*

Recent investigations in the Amoch Group of Ceibal, a minor ceremonial complex located outside of the site epicenter, have provided new insights into the transition from the Preceramic to the Middle Preclassic periods in the Maya lowlands (ca. 1000 BC). Previous investigations in the civic-ceremonial core of Ceibal revealed an E Group dating to around 950 BC, while the earliest known permanent domestic architecture dates to approximately 750 BC. These results suggest that many people residing in the area continued to lead a somewhat mobile lifestyle for centuries after a permanent ceremonial complex was built. In the Amoch Group, many burials have been found in a layer above bedrock that contains very little cultural material and no ceramics. Radiocarbon dating of the remains of some individuals reveal they date to 1000–800 BC, while preliminary isotopic analyses reveal some people came from outside the Ceibal area. The Amoch Group likely served as a cemetery around the time the ceremonial center was established, before many people adopted a fully sedentary way-of-life and began to use pottery. This burial practice represents an important step in transitioning to sedentism and for creating community identities.

**Burke, Chrissina (Northern Arizona University), Magen Hodapp (Northern Arizona University), Kelsey Gruntorad (Grand Canyon National Park), Natalie Patton (Denver Museum of Nature and Science) and Wyatt Benson (Colorado State University)**

[214]

*Awl Mighty Tools: Comparing Experimentally Created Animal Bone Tools to Archaeological Examples*

Experimental archaeology supports our understanding of past lifeways and how artifactual materials were created. In zooarchaeology, its use in interpreting how previous populations may have crafted animal bone tools is imperative to identifying preforms and other stages of the manufacture process. The Northern Arizona University Faunal Analysis Laboratory (NAUDAFAL) has conducted several experiments creating bone awls from pronghorn and deer metapodials. These experiments included both standardized experimental creation and use of the tools and additional assessments to improve the pliability of the bones with heat prior to their manufacture. The goal of this experimental research was to compare our results with archaeological materials. As such, throughout our analysis of the Houck faunal assemblage curated at the Museum of Northern Arizona, we used our experimental bone tools to assist in data collection and tool identification. For this presentation, our comparative analysis focused on metapodial awls, specifically striation patterns, cut marks, and general shape of the tool. We determined that the markings on the experimental and archaeological awls were similar to each other, suggesting NAUDAFAL's methodology for constructing bone awls may be similar to the method used in the past.

Burke, Chrissina [122] see Coppola, Anna

Burke, Chrissina [71] see Priest, Brooke

Burke, June [124] see Hard, Robert

Burks, Jarrod [177] see Small, Marsha

Burlot, Jacques [48] see Schollmeyer, Karen

**Burnett, Paul (SWCA Environmental Consultants) and Erik Otárola-Castillo (Purdue University)**  
[170]

*Spatiotemporal Modeling of the Archaeological Landscape in the Shoshone National Forest*

In 2002, Dr. Lawrence Todd initiated a multiyear interdisciplinary survey in the Shoshone National Forest in northwest Wyoming. Dr. Todd and his team have meticulously documented several thousand individual artifacts per year. While they only sampled a small fraction of the forest, Dr. Todd's work has dramatically improved our understanding of this archaeological landscape and its prehistoric periods. In addition, his efforts have enhanced our understanding of land use in this area and the Rocky Mountains in general. Since 2009, the authors have been using this information collected at the artifact level to produce probability maps covering the Shoshone National Forest. These continue to be improved as additional sampling efforts add new artifacts to the sample and new modeling techniques become available. The models have accurately captured up to 90% of independent artifact clusters in high probability areas, which occupy 20% of the forest. We will present our current model iterations focusing on interpreting changing land use intensity through time.

**Burns, Gregory (University of Utah; National Park Service)**  
[55]

*Reconsidering the Ideal Despotic Distribution on Agricultural Frontiers*

For settlement pattern analysis where territorial exclusion is assumed to be at play, Fretwell and Lucas's 1969 model is still the core explanation for IDD. Rather than focus on population density, it would be more in keeping with formal models of behavioral ecology to analyze the dynamic through marginal analysis. Established groups should defend territory up to the point where the cost of additional resource defense is equal to the potential loss in resources. Incoming groups should nibble at established territories up to the point where costs of aggression are equal to additional resources gained. Differences in marginal costs are essential to generating an IDD: where there is no difference in cost, there is no "despotism," and only as the difference increases will a strong difference in distribution between the IFD and IDD develop. On agricultural margins, a mixed strategy of foraging/raiding lowers the marginal costs for newcomers. Under these circumstances, the characteristic settlement pattern of the IDD may fail to emerge, even though incumbents would prefer to exclude newcomers. Previous research on Fremont settlement patterns in Utah is reconsidered under this updated model.

**Burns, Jonathan (Juniata College) and Amanda Rasmussen (USDA Forest Service)**  
[18]

*It Takes a Village to Raise a Fort: The Fort Halifax Rediscovery Project*

Fort Halifax Township Park in Pennsylvania is home to an eponymous French and Indian War site dating to 1756. A Juniata College archaeological field school in 2021 laid the foundation to receive an American Battlefield Protection Program grant from NPS in 2022. Using a combination of geoarchaeology, controlled metal detecting, and test unit excavation, the project located the frontier fortification by following artifact distributions to well-preserved archaeological features. Students from various colleges and universities worked to collect the evidence alongside military veterans and community members, learning the basics of archaeological fieldwork. The site is fortunate to be stewarded by a community that knows the value of historic preservation. For over a decade, archaeology at Fort Halifax has been supported by the local

nonprofit Friends of Fort Halifax Park, by other nonprofits, by municipal government, and by state and federal agencies. The rediscovery of Fort Halifax has been a fulfilling, rewarding, and successful endeavor. It has also come with all the challenges inherent when multiple entities with sometimes competing views have to work cooperatively to preserve and understand an important part of our shared heritage. There are lessons here for any archaeologist working with locally owned and managed parks.

**Burrillo, R. E. (PaleoWest)**

[201]

*Peoples of the Tall Pines: Precontact Architecture and Settlement Patterns in the Sierra Ancha, Central Arizona*

The Sierra Ancha (Spanish for “wide mountain”) of central Arizona boasts some of the richest human history in the greater Southwest, yet its archaeology remains understudied and poorly understood. The region lies within or between the boundaries of the Hohokam, Salado, Ancestral Pueblo, and Mogollon culture areas, and most of the interpretations of Sierra Ancha culture history are based on more thorough understanding of the surrounding regions. PaleoWest recently conducted approximately 8,000 acres of cultural resource inventory in the heart of the Sierra Ancha for fuels reduction projects on behalf of the Tonto National Forest. The results suggest that the region experienced a population surge during the Early to Late Classic or Pueblo III/IV transitional period, a time in which the nearby Colorado Plateau was all but entirely depopulated.

Burrillo, R. E. [201] see Yost, Scott

**Burton, Jeffery (US National Park Service)**

[38]

*Discussant*

**Burton, Jeffery (US National Park Service)**

[116]

*Imprisoned Orphans: Community Archaeology at Children’s Village, Manzanar War Relocation Center*

There were 10 War Relocation Centers established during World War II to incarcerate over 120,000 Japanese American citizens and immigrants, but only one had an orphanage. Manzanar’s “Children’s Village” housed 101 orphans, from newborns to teenagers. The entire mass incarceration was unconstitutional, tragic, costly, and unnecessary, but imprisoning orphans seems especially egregious. Now Manzanar is a National Historic Site, designated to preserve and interpret cultural resources associated with this history. A recent Community Archaeology Project, funded by a former orphan, uncovered features and artifacts that shed light on the lives of the orphans and the absurdity of their incarceration. By removing vegetation and flood deposits, the project turned an overgrown thicket into a commemorative space. Today, the public can visit the Children’s Village site to learn about and contemplate one small example of the consequences of government actions motivated by racism, wartime hysteria, and a failure of political leadership.

Burton, Nicole [173] see Bond, Julie

**Burt, Amanda (Indiana University Purdue University, Indianapolis) and Larisa DeSantis (Vanderbilt University)**

[245]

*A Multi-method Investigation of the Diets of Dogs from the Angel Site*

The Angel site (12VG1) is located in southern Indiana, USA, on the Ohio River, and was occupied from approximately 1100 to 1450 CE. This site is part of a larger Mississippian cultural landscape. Research presented in this paper employs two methods for investigating the dietary behavior of domestic dogs recovered from the Angel site. Both dental microwear texture analysis and stable isotope analysis are utilized

to explore dog-keeping practices and cultural influences on dog feeding. Dental textures from phase II dental facets are studied to evaluate access adult dogs had to valuable food resources. Results from stable isotope analysis of tooth enamel examine the role that cultivated foods played in the diets of juvenile dogs. This study shows the value of applying different methods for assessing the diets of dogs. Investigating access that domestic dogs had to food resources contributes to understanding a fundamental aspect of the human-canine relationship and is crucial for imagining dog-keeping on past landscapes.

**Busch, Daniel and Nick Angeloff (Cultural Resources Facility, Cal Poly Humboldt)**

[64]

*Linguistic Prehistory and Migration in Northwest California in Light of Recent Paleoindian Evidence*

This paper provides context to the linguistic and migrational prehistory of Northwest California and reinterprets the common narrative in light of the recent discovery of a Clovis point in Larabee Valley which extends the reach of Paleoindians into Humboldt County, California for the first time.

**Bush, Kelly and Julia Furlong**

[143]

*A Case for Early Outreach Designed to Recruit CRM Professionals at the High School and College Level*

Cultural resources management (CRM) is at a pivotal moment in its history. Increasing workloads and an insufficient stream of early professionals have created a labor crisis. We are not alone in identifying recruitment as one solution. With the goal of increasing the number of bachelor's degrees we have designed and tested outreach materials and activities aimed at inspiring high school and early college students to seek careers in CRM. This is a rewarding and fulfilling career for those who like the outdoors and want to make an impact in their communities concerning heritage preservation. We believe awareness of this career option is one key to recruitment. Our presentations are targeted for various groups, focus on science, technology, engineering, and mathematics (STEM), and are image heavy, with plenty of time for questions, and for our in-person trainings hands-on activities. We are doing these presentations in classrooms and other meeting places. This paper is a call to action. What else as CRM professionals and academics can we do to ensure a stream of qualified archaeologists into the CRM field? Join us in this goal.

Bush, Kelly [149] see Koehnen, Fiona

Bush, Leslie [130] see Koenig, Charles

Bush, Leslie [82] see Lohse, Jon

Butero, Robert [14] see Larkin, Karin

**Butler, Amanda (Minnesota State University, Moorhead)**

[57]

*Chair*

**Butler, Amanda (Minnesota State University, Moorhead)**

[57]

*Unsettling Infrastructure: The Feral Qualities of Water in an Archaeological Tale of Railroads and Pipelines*

The eastern Great Plains of North Dakota and west-central Minnesota are home to the remnants of one of the world's largest ancient glacial lakes, Lake Agassiz, as well as the United States' longest river, the Missouri. These two powerful water entities shaped and disrupted the settler infrastructures of the Northern Pacific Railroad and later, the Dakota Access Pipeline. These vibrant entities embody what Anna Tsing and colleagues call Feral Qualities or "the ways entities attune to infrastructure." Drawing from Indigenous

philosophies and multispecies ecological lenses, this paper examines the boom-and-bust infrastructures from a turn of the twentieth-century boom town in west-central Minnesota and the recent oil boom of western North Dakota. I consider new approaches to theorizing infrastructure, anchored in the recent historic and archaeological investigations of Winnipeg Junction, a short-lived railroad town of Scandinavian immigrants.

**Butler, Caelie, Tammy Buonasera (University of California, Davis) and Shelby Anderson (Portland State University)**

[27]

*An Experimental Study of Arctic Ceramic Cooking Vessel Performance*

Ceramic vessels from the Norton (2800–1500 BP) and Thule (1350–250 BP) traditions often differ in wall thickness and the proportion and type of temper, suggesting they may have performed differently for cooking. This experimental study explores how technological choices (wall thickness, temper, and surface treatments) affected physical characteristics including porosity, strength, and heating capabilities, and how people in the Arctic may have cooked with ceramic vessels from these two traditions. Phase 1 tested physical characteristics (porosity, hardness, and tensile strength) of ceramic tiles manufactured with different combinations of temper and surface treatments (oiled or not oiled). For Phase 2, water was brought to a boil in replica Norton and Thule vessels using three different heating methods (direct heating, stone boiling, and suspension). Phase 1 identified differences in strength and porosity of test tiles with specific temper and surface treatments. Phase 2 showed significant differences in the rate of heating using different heating methods, but not between the two types of replica vessels. Results of this study suggest that distinctive characteristics of Norton and Thule pottery may not be related to methods of heating, but could relate to other factors, potentially including constraints affecting ceramic production and economic or social factors.

Butler, Caelie [123] see Diciuccio, Laurel

**Butler, RaeLynn (Historic and Cultural Preservation Manager)**

[32]

*Discussant*

Butler, RaeLynn [74] see Holland-Lulewicz, Jacob

**Butler, Virginia (Portland State University)**

[62]

*Discussant*

Butler, Virginia [72] see Daily, Phillip

**Buvit, Ian (Central Washinton University)**

[15]

*Chair*

**Buvit, Ian (Central Washinton University) and Julie Esdale (Colorado State University CEMML)**

[15]

*Technological Origins of the Denali Complex*

Our understanding of the origins of early Alaskan assemblage variability is challenged by the co-occurrence or absence of two key lithic technologies—microblades and bifacial projectile points—and the variety of morphologies and production strategies within these categories. Alaskan archaeological complexes that existed prior to the 12,000-year-old Denali complex do not contain the breadth of artifact types found in Denali sites. For example, Denali sites have produced stemmed/lanceolate projectile points, several

microblade core forms, and tools such as Denali burins, not found elsewhere. In 1967, F. H. West stated that Denali artifacts, including those from the Donnelly Ridge site, most closely resemble examples from the Shirataki Complex of Hokkaido. Here we explore the technological origins of Denali from a regional perspective, paying special attention to lithic assemblages from northern Japan.

Buvit, Ian [15] see Esdale, Julie

Byerly, Heather [21] see Carlson, Justin

Byerly, Ryan [170] see Egeland, Charles

**Byers, David (Utah State University), Peter Yaworsky (Aarhus University) and Jack Broughton (University of Utah)**

**[198]**

*Climate, Prey Choice, Signaling, and Risk: An Integrated Analysis of Holocene Hunting in the Bonneville and Wyoming Basins, USA*

In this poster, we synthesize the available empirical data on return rates for artiodactyls and lagomorphs and explore and integrate different currencies to guide a trans-Holocene analysis of variation in artiodactyl hunting using massive archaeofaunal datasets from predominantly open-air sites from the Bonneville and Wyoming basins. The available empirical data continue to suggest that artiodactyls yield consistently higher return rates than lagomorphs, allowing us to leverage predictions from both the prey choice and energetic-risk models that the relative importance of artiodactyl hunting should scale closely with climate-based change in their abundance on the landscape. We document with modeled climate data that seasonal variables correlated with the relative frequency of artiodactyl hunting in both regions, but that summer temperature has the most important effect. The results have implications for influential behavioral ecological models that relate to diachronic variation in artiodactyl abundances. Specifically, we use the negative relationships between summer temperature and artiodactyl abundances to test predictions from costly signaling models that suggest contexts characterized by greater platforms for social display should exhibit higher artiodactyl abundances than would be predicted from prevailing climatic conditions alone—there is no support for this prediction in either region.

Byl, Sylvie [203] see Erauw, Céline

Bynoe, Rachel [212] see Leader, George

Bynoe, Rachel [114] see Marks, Theodore

**Byram, Scott (University of California, Berkeley), Kent Lightfoot (University of California) and Jun Sunseri (University of California)**

**[152]**

*Projectiles or Pikes? Clovis Point Attributes and Braced Weapon Use*

Fluted point weaponry types and the expansion of Indigenous people across North American megafauna habitats 13,050–12,650 cal BP are considered in light of historical polearm use. Confronting megaherbivores such as *Proboscidea* and *Bison* or megacarnivores such as *Arctodus*, *Panthera*, and *Smilodon* with thrust or thrown spears was likely less effective than pike (braced lance) impalement using the large animal's mass and movement toward the pike wielder, whether as charge, lunge, or tusk or horn sweep. Assessing historical accounts of braced weapon use against lions, boars, grizzlies, and warhorses, we consider hunting and defense with lanceolate Clovis points as pike tips, deployed with the long shaft's base set in the ground. We

propose that (1) the sharp, resilient Clovis point increases hide entry reliability; (2) its flute makes possible the thicker shaft needed to sustain massive compressive impalement force; and (3) post-incision the biface may become less critical as mainshaft impalement continues deceleration and injury. Experiments are underway to assess whether the wedge-shaped, incurvate base allows staged hafting collapse and point recession when bone is encountered. Points detaching after hide entry could partially account for high frequencies of Clovis isolates and complete specimens at unbutchered mammoth sites such as Naco.

Byram, Scott [177] see Tripcevich, Nicholas

Byrd, Brian [163] see Buonasera, Tammy

Byrnes, Bradley [21] see Rowe, Robert

Byrnes, Jennifer [134] see Woollen, Katharine

**Cabrera, Kevin**  
[175]

*A Gender Paradox? A Case Study from the Ancient Maya*

Bioarchaeology engages with past behaviors to answer sex and gender roles that are influenced by biological and cultural components leading to social presentation of the individual. The skeletal sample for this study focuses on 55 individuals from Copan, Honduras, by incorporating available mortuary data, ceramic phases, dental development, physiological measurements, and stable isotopes. Mortuary data represent the context of material goods and iconographic detail about the individual's burial. Temporal control of ceramic phases helps narrow interment dates to specific time frames in ancient Copan's history to examine changes through time. Dental development can pinpoint when social childhood ends. Incorporating physiological skeletal measurements provides another insight into the body and help in the creation of biological profiles and link to the behavioral components of the physical body. Finally, isotopic elements can answer what gender manifestations can be observed (i.e., gender food behavior) linking it back to sex and gender theory of embodiment and difference in diet consumption. This research focuses on the results of the isotopic data linking to the question if there was gender food behavior from Copan's Late Classic period (AD 600–822).

Cabrera Castro, Ruben [3] see Buckley, Gina

**Cabrero-Miret, Ferran**  
[140]

*Río Chico in the Distant Past of the Pastaza Valley, Ecuador*

In the last 50 years, from Amazonian archaeology there has been a remarkable and growing debate about the origin and dispersion of the cultures of the area, their carrying capacity, population number and density, political structure, and links with the adjacent geographical areas, such as the Andes to its western border. More recently, paleobotanical analysis has added complexity to interpretations, yielding unpublished data for the region. This report presents survey and excavation results from the site of Río Chico, located near the city of Puyo, Ecuador. Analysis of the biocultural remains are especially presented, including results in paleodiet and macronutrients showing an important variety of foods. Currently, Río Chico is the oldest multicomponent village-type mound site of the Pastaza drainage, one of the great rivers of the Amazon basin; from the late Formative period to the Integration period, passing through the Regional Development. It is part of a series of monumental sites in the Upper Amazon of Ecuador but is unique in the area with evidence of consumption of certain plants and interregional trade.

Cai, Quanfa [203] see Yi, Hailin

**Cajigas, Rachel (University of Alabama), Elliot Blair (University of Alabama) and Matthew Sanger (National Museum of the American Indian)**

**[49]**

*Geophysical and Archaeological Explorations of the Center of the Creighton Island Shell Ring (9MC87), Georgia, USA*  
Creighton Island Shell Ring (9MC87) is one of several Late Archaic shell rings, circular or “U”-shaped deposits of shell and soil, in coastal Georgia. Radiocarbon dates suggest the shell ring was constructed in at least two phases: constructed initially around 2000–1810 BC, and ceasing around 1920–1730 BC, indicating rapid construction and slightly post-dating the abandonment of other Late Archaic shell bearing sites in the region. Magnetic gradiometry and soil resistance surveys conducted at the shell ring identified multiple anomalies related to the shell ring morphology as well as features within the center. Ground truthing confirmed the presence of features detected in the center of the ring. However, unlike many other shell ring sites that have relatively shell-free interiors, archaeological excavations revealed that the Creighton Island shell ring interior contains an approximately 30 cm thick deposit of whole and broken oyster shell. Preliminary analysis of the ceramic assemblage suggests that this thick shell lens was deposited during the Woodland period, suggesting significant site re-use following the Late Archaic period. This paper presents results from these interior ring excavations.

Cajigas, Rachel [127] see Dober, Joseph

Calandra, Ivan [33] see Marreiros, Joao

Calder, Jeff [41] see Melton, J. Anne

Callaghan, Michael [43] see Batres, Kimberly

Calleja, Maryann [227] see Baustian, Kathryn

Camarillo Sánchez, Oswaldo [247] see Trejo Ordoz, Alondra

Cambranes, Rafael [236] see Baldwin, J. Dennis

**Cameron, Asa (Yale University)**

**[244]**

*Laying Down with Dogs: The Role of Canis familiaris in Mongolia and Transbaikal during the Xiongnu Period*  
The Xiongnu period (ca. 250 BC–AD 150) of Mongolia and Transbaikal marks a dramatic change in the frequency and treatment of domestic dogs (*Canis familiaris*) in the archaeological record. While this shift in burial and consumptive practices are indirectly acknowledged in the academic literature, the potential causes for and meaning behind the elevated importance of dogs during the Xiongnu period remains unexplored. This study examines human-canine relationships during the Xiongnu period through a review of canine mortuary offerings and presence at settlement sites across Mongolia and Transbaikal. Included in this discussion are new canine skeletal data recovered during recent excavations at Khurts Del, a Xiongnu ring grave cemetery in the Gobi-steppe of southeastern Mongolia. A comparison of these data with dog remains documented in adjacent regions of Eurasia allows for speculation on the potential causes for the shifting nature and prominence of human-canine relationships in the archaeological record at this time.

**Cameron, Catherine (University of Colorado)****[213]***Warfare, Captive-Taking, Enslavement, and the Creation of Power*

Raiding and captive-taking were common activities in small-scale societies prior to the modern era. A majority of captives were women and children; some were enslaved while others were incorporated into the societies they joined. Ethnohistoric accounts make it clear that regardless of their social position, captives created power for the individuals who held them. Captives are followers and in small-scale societies, the more followers an individual had the greater their social power. Captives were also a labor force that could be put to producing food or goods for trade, a source of economic power for the individuals who held them. Captives themselves were high-value trade items (often the highest) and were widely exchanged among small-scale and more complex societies. Captives could clearly create power for their owners, but in which situations were they key to the development of complex societies? Of course, not all societies that held captives became complex, but some did. This paper uses ethnohistoric and other data to explore the role of captives in the development of state-level societies and suggests some circumstances in which their presence was central to this transformation.

Cameron, Catherine [24] see Brooks, James

Campbell, Anna [216] see Sturm, Camilla

**Campbell, Renae (University of Idaho) and Mark Warner (University of Idaho)****[117]***Training Students: Collaboration across the Academic Divide*

A familiar refrain among archaeologists working outside of academia is the myriad of training shortcomings in higher education anthropology programs. There is no doubt that there is room for improvement within the academy. However, there is also room for CRM, state, and federal archaeologists to collaborate in training students more effectively. Engagement with universities asks that collaborators share certain responsibilities but also provides avenues for mutual benefit and for beginning to address frequently voiced critiques of academic training. One small example of innovative collaboration is the Boise National Forest's partnership with the University of Idaho. Such relationships are opportunities to expand training in the academy to approximate more practice-based approaches found in other professional degree programs.

**Campbell, Rod (Institute for the Study of the Ancient World, NYU)****[213]***Warfare and the Polity in Early China*

Intercommunity conflict and sociopolitical complexity are both complicated topics, not only because of their large literatures and diverse approaches, but because of the multifaceted nature of the phenomena involved. For my talk I would like to focus on what I see as two key variables relevant to both warfare and political community. These are scale and centralization. Scale both in the sense of absolute scale of conflicts and communities but also the characteristic and relative scale of specific institutions and practices. In other words, I would like to explore a multiscale approach to both warfare and political community. Centralization, for its part, is to be seen as a spectrum and a feature of institutions at different scales. With this relatively limited scope I will explore received textual, inscriptional, and archaeological evidence from the Central Plains of China over roughly 1,000 years from the Shang period (ca. 1600–1050 BCE) through to the Warring States (ca. 476–221 BCE). During this time both the nature of polities and of warfare changed dramatically.

**Campbell, Wade (Boston University)****[188]***Discussant*

**Campbell, Wade (Boston University)****[23]***Early Navajo Social Organization and the Diné-Dibé-T'oh Relationship circa AD 1750*

The Early Navajo Pastoral Landscape Project is an ongoing study that explores the potential ways that incipient Indigenous pastoralism influenced early Navajo community life circa AD 1750. The recent dung-based identification of potential livestock enclosure features at four different Gobernador Phase Navajo residential clusters presents an opportunity to explore the role played by human-animal-environment interconnection within the larger system of tiered relationships that have traditionally organized Diné society for centuries. In particular, a combined ethnographic and archaeological approach enables one to consider the ways in which increasing Diné reliance on *dibé*, or sheep, might be connected to hypothetical shifts in early Navajo land use strategies across the greater Four Corners region during the seventeenth and eighteenth centuries.

**Campetti, Casey (Federal Transit Administration)****[187]***Discussant*

Campiani, Arianna [172] see Johnson, Lisa

**Campos, Cinthia (Binghamton University)****[43]***A Paleoethnobotanical Analysis of the Trincheras Tradition: Community, Identity, and Foodways*

The Trincheras Tradition thrived in the Altar Valley, Sonora, Mexico between AD 400 and 1400. The Hohokam are known for their extensive irrigation systems and reliance on agriculture. Lacking evidence of similar features, the Trincheras were interpreted as primarily hunters and gatherers, a rustic branch of the Hohokam. This characterization of Trincheras Tradition's cultural development was based on limited data. Recent research has significantly expanded our understanding of the Trincheras Tradition, however, questions about their foodways remained unresolved. Here, I present the results of paleoethnobotanical analysis of samples collected from three sites in the Altar Valley excavated in 2017–2018 as part of the transnational project, *Movilidad, Conectividad y Etnogénesis en la Tradición Trincheras, Valle de Altar*. Applying a combination of traditional ecological knowledge, methods, and theory in paleoethnobotany I interpret ancient Trincheras foodways and practices over time. Statistical analysis is applied to evaluate Trincheras' dependence on agriculture compared to that of the Hohokam. Looking beyond subsistence, this study integrates Indigenous ontologies, social practice theories, and political economy to shed light on Trincheras Tradition cultural development and identity.

Can, Jorge [74] see Messinger, Emma

Canale, Lauren [97] see Chen, Jennifer

**Cannell, Rebecca (Norwegian Institute for Cultural Heritage Research) and Lars Gustavsen (Norwegian Institute for Cultural Heritage Research)****[233]***The Past and Present Social Role of Viking Age Mounds*

Jellhaug, Norway, is Scandinavia's second largest prehistoric mound. Dating from the (pre)Viking period, it has a long history of human interaction and interpretation. Built in phases with distinct, selected, and transformed earthly materials, the mound compares with contemporary mounds in that both the material

selection from the familiar environment, the building experience, and the result, cemented communities. However, in the present, the Viking period is highly politicized, burdened with stereotypes, and perceived as the catalyst to modern state formation. Therefore, despite evidence to the contrary, the underlying assumption that they shared our singular view of the world persists, with the result that we project modern values onto sites such as Jellhaug. In the nineteenth century, due to Jellhaug's lack of conformity on the outside, the mound was dismissed, before tales of possible Viking ships were attached to it to form individual, local, and regional senses of identity. The final act was to make Jellhaug conform on the outside, by using a bulldozer, reshaping it into the idealized "Viking mound." This biography offers a reflection of how earth-made heritage is viewed, valued, and interacted with by different actors over time and space, from communal memory to modern ideals and political identities.

**Cannon, Kenneth (Cannon Heritage Consultants)**

[94]

*Chair*

**Cannon, Kenneth (Cannon Heritage Consultants), Ethan Ryan (Cannon Heritage Consultants) and Houston Martin (Cannon Heritage Consultants)**

[94]

*The Application of Strontium Isotopes in Tracking Holocene Bison in the Greater Yellowstone Ecosystem*

Light and heavy isotopic studies have become an integral tool in understanding the ecology of humans and vertebrates. In migration and mobility studies, strontium isotopes are used to determine if the individual is local to a particular area by comparing the isotopic values from bone and dental enamel of the specimen with local isotopic values that have been established for that specific geographic location. The local values of a specific place are determined by studying the underlying geology of a particular place. The GYE provides a unique research laboratory due to the number of distinct geologic substrates it contains. We should expect high-resolution  $^{87}\text{Sr}/^{86}\text{Sr}$  variation in this mountainous area due to the complex juxtaposition of lithologies. In this paper, we discuss the role of strontium isotopes ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) in tracking bison from five locales ranging in age from the Early Holocene Horner site to Late Holocene bison from Jackson Hole and Idaho. A comparison of the archaeological specimens with modern Yellowstone National Park bison indicates significant shifts in range and range size. This has implications not only for understanding the predictability of this resource for precontact Native groups but also in managing bison herds in the context of climate change.

Cannon, Kenneth [82] see Santarone, Paul

Cannon, Kenneth [170] see Widga, Chris

**Cannon, Molly and Anna Cohen (Utah State University)**

[94]

*Long-Term and Interdisciplinary Approaches to Water Use and Management in the Mountain West*

Water heritage associated with water use and management, including infrastructure like canals, irrigation ditches, and ponds, and intangible heritage like traditions, experiences, stories, and myths, reveals how past and present communities adapt to uncertain climatic and changing social conditions. Across the Mountain West, water heritage is rapidly being modified or destroyed by climatic uncertainty, water conservation efforts, economic development, and increasing tourism. Long-term and interdisciplinary approaches to understanding water heritage across time and space can highlight broad and universal patterns of water-human relations. Knowledge of this entwined relationship informs our ability to cope with current and projected climatic fluctuations like drought and extreme heat. This paper integrates ethnographic and archaeological case studies of water use and management from watersheds in northern and southern Utah, across multiple temporal scales, to inform on both academic research and cultural resource management. Archaeological datasets show how past communities modified landscapes, developed water infrastructure technology, and other cultural adaptations when faced with shifting climatic conditions. Information from ethnographic interviews present us with rich descriptive and first-hand accounts of water management in

practice among today's climate and development challenges. We illustrate how these sources provide a comprehensive understanding of human-water relations in the region.

Cannon, Molly [198] see Cheney, Chelsea

Canto Carrillo, Rodolfo [131] see Hutson, Scott

**Canuto, Marcello (M.A.R.I./Tulane University)**

[110]

*Discussant*

[158]

*Moderator*

**Canuto, Marcello (M.A.R.I./Tulane University) and Maxime Lamoureux-St-Hilaire (Mount Royal University)**

[93]

*From Polity to Regimes: Toward Recognizing Diversity in Ancient Maya Political Communities*

In this paper, we introduce the notion of “regime” to model and interpret ancient Maya political organization. We have long relied on “the polity” as a primary model to explain ancient Maya politics. However, this largely generalist core concept tends to homogenize—both temporally and geographically—the complex ancient political landscape as one populated by similar bounded political units recognized from within and without. In broad terms, “polity” best suits the study of how the Classic Maya society idealized and legitimated power relations rather than how they exercised them to create “political communities.” This theoretical lens thus recognizes but does not explain the diversity and dynamism of political communities that the archaeological record illuminates. We therefore propose to reintroduce perhaps the oldest term of political science: the “regime”; that is, “the realization of a polity.” We propose to go beyond the formal structure of political relations and the ideology of legitimacy to focus on practices of power. Simply put, studying regimes leads us to recognize variation among the “political communities” of the ancient Maya world.

Canuto, Marcello [165] see Auld-Thomas, Luke

Canuto, Marcello [93] see Barrientos, Tomas

Canuto, Marcello [93] see Bell, Ellen

Canuto, Marcello [238] see Ponce, Jocelyne

**Cap, Bernadette (San Antonio Museum of Art)**

[83]

*Discussant*

**Cap, Bernadette (San Antonio Museum of Art), Jason Yaeger (University of Texas, San Antonio) and M. Kathryn Brown (University of Texas, San Antonio)**

[165]

*Modeling Agricultural Production in the Mopan Valley, Belize*

Modeling agricultural yields provides one way to examine questions of Classic Maya agricultural practices and land management, with follow-on implications regarding intensification, household sustainability, and exchange practices. In this paper, we use models to examine whether milpa agriculture was viable as the primary agricultural strategy in Belize's Mopan valley during the Late Classic period, including the polities of Xunantunich and Buenavista del Cayo. We use lidar data to identify which areas of the landscape were conducive to milpa farming and which areas were intensified with terraced fields. We use multiple algorithms to create population estimates, using settlement data derived from pedestrian survey and lidar mapping. We

contextualize the results in light of the valley's heterogeneous landscape, mosaic of agricultural intensification, and marketplace-based economy.

Cap, Bernadette [93] see LeCount, Lisa

Capps, Matthew [95] see Kassabaum, Megan

**Capriles, José (Pennsylvania State University)**

[5]

*Discussant*

Capriles, José [177] see Tripcevich, Nicholas

Carballo, Agapito [191] see Díaz García, Mauricio

Carballo, Agapito [52] see McNeil, Cameron

**Carballo, David (Boston University), Daniela Hernández Sariñana (Boston University), Gabriel Vicencio (Boston University), Edith Dominguez (Proyecto Arqueológico Tlajinga Teotihuacan) and Santino Rivero (Escuela Nacional de Antropología e Historia)**

[26]

*The Southern Neighborhood Center at the Tlajinga District, Teotihuacan*

Life in Teotihuacan's urban neighborhoods revolved around the social infrastructure of local public spaces featuring temples, plazas, and other buildings with civic functions. Recent investigations in the Tlajinga district demonstrate that even on Teotihuacan's outer periphery these spaces could be quite elaborate, with structures elevated on talud-tablero platforms painted with vibrant mural art and offerings containing trade items from distant reaches of Mesoamerica. We present the results of recent analyses of the murals and materials from two structures in Tlajinga's neighborhood center and comment on their significance for understanding the use of such spaces and urban organization at Teotihuacan more broadly.

Carbaugh, Aimée [124] see Bader, Alyssa

Carbaugh, Aimée [124] see Hargrave, Eve

**Carbonell, Curt**

[124]

*Mobilizing and Motivating: Closing the Capacity Gap in Cultural Resource Management in British Columbia*

Entry into cultural resource management (CRM) in British Columbia (BC) requires a bachelor of arts or science in anthropology or archaeology, academic streams not typically associated with high employability. Yet, archaeology in BC is booming. Industries traditionally employing BC archaeologists outside of academia, such as forestry and mining, must now compete with municipal and private development as BC's population grows and, with it, local development. Combined with unprecedented emigration from urban centres, this means that BC archaeology is witnessing an increasing demand within an industry limited by finite capacity and a not-insubstantial barrier to entry. On top of the academic requirements, recent and historical problems centred on colonizer-colonized power dynamics and Indigenous land claims and rights have cooled enthusiasm in younger generations of potential archaeologists who must grapple with the ethics of joining an industry thoroughly embedded within the exploitative intersection of colonialism and capitalism. By recognizing the growing capacity gap, one can then explore possible causes such as field avoidance due to the aforementioned history of archaeology in the Americas, and then promote potential solutions, including

public education, Indigenous Archaeologies, and decolonizing the field. If CRM archaeology is to thrive, equipping upcoming archaeologists to do “good” archaeology is paramount.

Cardarella, Brittney [44] see Donnermeyer, Christopher

Cardinal, James Scott [80] see Loughmiller-Cardinal, Jennifer

**Cardoso, Jessica (Géosciences Environnement Toulouse [GET/OMP], University of São Paulo), Benjamin Fuller (Géosciences Environnement Toulouse [GET/OMP]), Pauline Méjean (Géosciences Environnement Toulouse [GET/OMP]), Andre Strauss (University of São Paulo) and Klervia Jaouen (Géosciences Environnement Toulouse [GET/OMP])**

[3]

*Using Traditional and Nontraditional Isotopic Tracers of Diet and Mobility of Brazilian Shell Mound Populations (ca. 8000–1000 years BP)*

The study of shell mounds can shed light on human occupation and adaptations at coastal environments worldwide. In South America, human groups occupied the territory close to the Atlantic Ocean for millennium (ca. 8000 to ~1000 years BP), building hundreds of shell mounds, some with impressive dimensions. After 2000 BP, it is assumed that these populations progressively disappeared when environmental changes occurred and new pottery-using populations arrived from the inland. We aim here to investigate the mobility of the shell mounds' populations before and after the arrival of ceramic traditions, reconstructing their diets in order to test the aforementioned hypothesis. To do so, we conducted a combination of traditional (bulk collagen  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ , amino acid  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ,  $^{87}\text{Sr}/^{86}\text{Sr}$  of hydroxyapatite) and nontraditional ( $\delta^{66}\text{Zn}$  and  $\delta^{88}\text{Sr}$  of hydroxyapatite) isotope measurements as well as trace elements concentrations on fauna and humans from eight archaeological sites from across southeastern Brazil. Results of nontraditional isotopes measurements elucidate and improve our understanding of food webs, environment, and diet of ancient populations. This unprecedented combination of isotopic analysis provides us with new insights about how shell mound populations in Brazil adapted to coastal environments, and the identification of local and nonlocal individuals.

**Carlson, David (University of Washington)**

[188]

*Discussant*

**Carlson, Justin, David Pollack (Kentucky Archaeological Survey), David Breetzke (Daniel Boone National Forest), Deborah Parrish (Kentucky Archaeological Survey) and Heather Byerly (Kentucky Archaeological Survey)**

[21]

*Middle Archaic Mobility and Resource Utilization in the Cumberland Plateau of Southeastern Kentucky*

The Sumac Terrace site (15Ls141), located in the Cumberland Plateau, was primarily occupied during the Middle Archaic (6000–4000 CE). The recovery of a large number of exhausted chipped stone tools and debitage from tool maintenance, and the presence of rock-lined hearths and cooking pits, and sheet midden within a relatively small area (20 × 30 m) suggests intensive, repeated use of this locality. The site is located on a toeslope beside a wetland, and surrounded by ridges, which would have offered those that camped at this locality access to a variety of plant resources and protection from the weather. The debitage raw material profile from this and neighboring sites indicates that about one-third of the chert used by the hunter-gatherers who frequented this region was obtained from more northerly sources in the Kentucky and Licking drainages. This is suggestive of seasonal rounds that involved movement over a relatively large area. The data from Sumac Terrace is considered in relation to contemporary sites in the Cumberland Plateau and neighboring regions to model hunter-gatherer use of upland settings during the Middle Archaic.

**Carlson, KC (Kristen) (Augustana University) and Douglas Bamforth (University of Colorado, Boulder)****[184]***How Many People Occupied 25BD1 at AD 1300*

The Lynch site (25BD1) is an 80 ha thirteenth- and fourteenth-century Plains Village site on Ponca Creek in northeastern Nebraska occupied by ancestors of the modern Pawnee and Arikara nations. Radiocarbon dates on material from past and recent excavations across the site indicate that settled maize farmers occupied the entire site at AD 1300. We present a range of estimates of the number of people who lived at 25BD1 at its maximum extent based on excavation data, extensive geophysical prospecting, and comparisons of house densities and sizes in horticultural sites on the central and northern Plains. These range widely but indicate that the smallest population likely to have lived there far exceeded the occupation of the town at any point post colonization by Europeans.

Carmignani, Leonardo [159] see Soressi, Marie

Carmody, Stephen [89] see Miller, D. Shane

**Carney, Molly (University of Arkansas)****[23]***Weaving Kin Studies and Multispecies Frameworks into Collaborative Paleoethnobotanical Research*

Over the last 20 years practitioners, activists, and scholars across disciplines have repeatedly pointed out the importance of incorporating other-than-human kin, relationality and reciprocity, and Traditional Ecological Knowledge into scientific practice when working with Indigenous peoples. These works urge us to embrace the unique connections between Indigenous and Western scientific approaches to understanding and explaining a world in which human and agential other-than-human beings are inextricably related. Similarly, multispecies studies advocate for a more-than-human approach to the interconnectedness and inseparability of humans and other life forms. Paleoethnobotany, which seeks to explore the relationships between past people and plants, is remarkably well-suited to contribute to these conversations. In this paper I explore similarities and differences across North American Indigenous onto-epistemologies and multispecies frameworks, echoing Indigenous scholars who have long shared their relational and agential histories and philosophies. I argue that by working between and weaving these frameworks, paleoethnobotanists may be better positioned to envision new questions, establish meaningful collaborations with descendant communities, and generate new insights into the past. I highlight several North American case studies wherein such an approach has the potential to reorient archaeological inquiry, praxis, and interpretation.

**Carolus, Christina (Yale University)****[244]***Sowing the Seeds of Empire: New Insights into Xiongnu Agriculture and Agronomy*

The Xiongnu period (ca. 250 BC–AD 150) was a particularly transformative time in the history of the eastern Eurasian steppe. Intensive study of the dimensions of sociopolitical, technological, subsistence, and material cultural transformation associated with the emergence of the Xiongnu state has thus been a focal point of Mongolian archaeological research for the past two decades. Recent research posits a complex and diversified steppe political culture whose success may have been based in flexible agropastoral practices. However, a complete picture of Xiongnu foodways and the food production practices underpinning these broad transformations remains elusive. The nature of the arrival, significance, and diversity of agricultural products—namely cereal products—in Xiongnu foodways is especially unclear. This paper presents an overview of archaeobotanical, stable isotopic, and archaeogenetic evidence for eastern steppe populations' relationships to agricultural practices and products prior to and during the Xiongnu period. It then reports preliminary results of the first formal macrobotanical and stable isotopic analysis of an economic crop

assemblage recovered from Mongolia in this period: that of Egiin Gol, a Xiongnu settlement area in northern Mongolia. These data are drawn together to temporally and spatially situate Mongolian participation within the broader history of the trans-Eurasian crop exchange.

Carpenter, John [41] see Davidson, Jaron

Carpenter, John [48] see Krug, Andrew

**Carpenter, Lacey (Hamilton College) and Leah Minc (Oregon State University)**

[146]

*State Formation and Economic Integration: New Perspectives from Ceramic Sourcing in the Oaxaca Valley, Mexico*

The two occupations at Tilcajete, El Mogote and El Palenque, offer a unique perspective on the political and economic changes surrounding the rise of Monte Albán. Located in the southern arm of the Valley of Oaxaca, El Mogote was an important Rosario phase (700–500 BCE) community that grew in size and political importance during the Early Monte Albán I phase (500–300 BCE). During the Late Monte Albán I phase (300–100 BCE), the site was rebuilt and continued to grow while resisting Monte Albán's control. This later occupation is known as El Palenque. Here we utilize ceramic provenance data from El Mogote ( $N = 280$ ) and El Palenque ( $N = 194$ ), supported by a large regional database, to examine how exchange interactions between the sequential occupations at Tilcajete and other valley communities were affected by the rise and growth of the Monte Albán state. The results provide new insights into whether Monte Albán's influence enhanced unification and integration of the valley, or led to increased economic fragmentation.

Carpenter, Lacey [101] see Budner, Hannah

Carpenter, Lacey [122] see Hoyt, Delia

Carpenter, Lacey [44] see Ives, Charlotte

Carpenter, Lacey [102] see Symmonds, Molly

**Carpenter, Michelle (University of Texas, San Antonio), Robert Hard, James Watson, Elisa Villalpando and Raymond Mauldin**

[252]

*Stable Isotope Analysis of the Early Agriculture Period at La Playa (SON:F:10:3), Sonora, Mexico*

[WITHDRAWN]

**Carpio, Edgar (Universidad de San Carlos)**

[152]

*An Amazing Deposit of Obsidian Blades in a Sector of Kaminaljuyu, Guatemala*

In recent years the rescues carried out in Guatemala City, specifically between zones 7 and 11, have uncovered several deposits containing huge amounts of obsidian artifacts. During the excavations of the Lake Miraflores project located on the San Juan causeway, zone 7, a huge deposit containing thousands of obsidian artifacts was uncovered. This deposit can be related to another already studied in the vicinity of mound C-IV-4 of Kaminaljuyu. This paper presents the results of the preliminary study of the deposit that reported very interesting data on the use of obsidian in the site that will help provide a better understanding of the role of obsidian in the economy of Kaminaljuyu toward the end of the Preclassic period.

Carr, Christopher [17] see Dunning, Nicholas

Carr, Robert [165] see Shi, Stone

**Carrasco, Michael (Florida State University) and Joshua Englehardt (Colegio de Michoacán)**  
**[80]***Visualizing Speech: Unfolding the Narrative of the Papaloapan Stela*

In this paper we examine the complex iconography of the Papaloapan Stela (originally labeled by Stirling as Cerro de las Mesas Stela 2) with a particular focus on the narrative integrity of the tableaux, the depiction of speech, and the relationship between the visualization of language and possible glyphic texts. Our analysis is based on 2022 fieldwork that resulted in photogrammetric models that permit fuller appreciation of particularly significant details on the stela. These were then compared with the Jorge Pérez de Lara's high-resolution photographs that were part of John Justeson's 2005 documentation project of Epi-Olmec script and imagery. In contrast to reading the iconography as distinct on each side, our results suggest linked scenes integrated by speech scrolls or cords, which originate from the dialogue between the two figures and a text block on the reverse of the monument, and continue to the figures on each of the other three sides. From this we conclude that the imagery was likely conceived of as a whole and that the presence of text and the depiction of language played a key role in the narrative composition of this unique monument.

Carrasco, Michael [80] see Englehardt, Joshua

**Carriere, Ed (Suquamish Tribe) and Dale Croes (Washington State University)**  
**[196]***Generationally Linked Archaeology: A New Line on Ancient Northwest Coast Cordage*

Ed Carriere, Suquamish Elder (88) and Master Basketmaker, has had a lifetime goal of practicing the art of making early indigenous cordage, nets, and basketry. Teaming up with Dr. Dale Croes (WSU), Ed and Dale have published their "Generationally Linked Archaeology" approach, using ancient cordage and basketry from Salish Sea wet archaeological site collections to statistically link thousands of years of ancient Coast Salish styles to current early Salish styles from Ed's training (working from deep time up and Ed's current efforts down). In large part, this led to Ed receiving the national Community Spirit Award in 2022 from the First Peoples Fund, that awards four Indigenous Masters a year: "exceptional artists who have worked selflessly throughout their lives to weave their cultural knowledge and ancestral gifts into their communities." Through his work with ancient archaeological basketry and cordage dating to as early as 4,500 years ago, he has directly learned from over 200 generation of Salish Sea fiber artists, and presented the teachings of 200+ grandparents to their descendant communities. In this poster presentation, Mr. Carriere will present an overview of his archaeological fiber and perishable artifact replication, research, and demonstrate the making of ancient style cordage and nets.

Carrillo, Jose Damian [200] see Gastelum-Strozzi, Alfonso

**Carroll, Jon (Oakland University)**  
**[160]***Updated Perspectives on Sennacherib's Siege at Tel Lachish*

From gypsum reliefs that once decorated the walls of the Assyrian capital at Nineveh, archaeologists know that Sennacherib's army laid waste to the city of Lachish, Judah (now Israel) in 701 BC. There remains no consensus on how these events unfolded, but many researchers agree that the Lachish reliefs were intended to serve as both historical record and propaganda. The reliefs have informed differing explanations regarding how the city fell. Computer modeling and simulation allow for the evaluation of competing hypotheses regarding the tactical choices of the Assyrians. Using a virtual landscape reconstructed digitally from aerial drone imagery, it becomes clear that the reliefs depict choices that make little tactical sense in the way the siege of Lachish is portrayed in stone. Updated explanations for the Assyrian victory are presented.

Carson, Lexi [167] see Hora, Elizabeth

**Carson, Mike (Micronesian Area Research Center [MARC])****[113]**

Chair

**Carson, Mike (Micronesian Area Research Center [MARC])****[113]***Natural-Cultural Contexts of the First Inhabited Seashores of Remote Pacific Oceania: 1500–1100 BC in the Mariana Islands*

People first migrated to the remote-distance Pacific Islands around 1500 BC, and their ancient sites have provided insights into the physical and cultural world that these people had inhabited. Geoarchaeological investigations have clarified the composition of the coastal landforms and ecosystems, availability of freshwater sources, access to varied habitat zones, relations among residential areas and ritual caves, and other aspects of the places where people first lived at several sites of Guam and the Mariana Islands. Three sites in particular have been most productive at Ritidian (Litekyan) of Guam, at Sanhalom (House of Taga) of Tinian, and at Unai Bapot (Laulau Bay) of Saipan. The results support new discussions and testable hypotheses about what happened during and after the world's longest ocean-crossing migration of this time, exceeding 2,000 km.

**Carter, Alison (University of Oregon)****[6]**

Chair

**Carter, Alison (University of Oregon) and Kelby Beyer (University of Oregon)****[210]***Contextualizing a Collection: Compositional, Morphological, and Trade Network Insights from an Iron Age Collection of Rare Southeast Asian Glass Ornaments*

Though Iron Age (500 BCE–500 CE) Southeast Asian glass ornament research is a well-established field, previous studies have almost exclusively examined the glass beads comprising the majority of glass ornament assemblages at Iron Age Southeast Asian sites. Even when other ornament types are noted, these descriptions are of fragmented objects. This study reports on a unique collection of seven complete glass earrings, five complete glass bangles, and a single spiral ornament donated to the University of Oregon for repatriation to Cambodia and believed to originate from the site of Phum Snay, Cambodia. Here, we contextualize this collection within the corpus of glass ornaments circulating in Iron Age Southeast Asia and report on results from compositional analysis of six of these objects using LA-ICP-MS. Results from this analysis identified multiple glass types, including potash glass and high-alumina soda glass. This research is ultimately relevant for its novel compositional and morphological data and insight into the circulation of these ornaments in regional exchange networks.

**Carter, Andrew (University of West Georgia, Antonio J. Waring Jr. Archaeological Laboratory), Nathan Lawres (University of West Georgia), Jennifer Glaze (University of West Georgia) and Deborah Wold (University of West Georgia)****[181]***Out of the Lab and into the Public*

As a field, it should be our responsibility to continually strive to develop engaging, approachable, and novel means to get “out of the lab” and into the general public (and help others do the same). While the Antonio J. Waring Jr. Archaeological Laboratory is primarily an archaeological repository and research facility, this philosophy has helped drive two of our main operational goals—education-outreach programming and exhibit development. This poster will explore the growth of this initiative over the past years, discussing the many types of products generated as part of our operation that includes outreach activities, public events, exhibit development, and virtual and augmented reality products, among others. Public responses to these initiatives, strategies employed to extend Waring's reach to these communities, and the future of these initiatives will be discussed as well.

Carter, Andrew [181] see Edmondson, Joel

**Carter, Benjamin (Muhlenberg College)**

[12]

*The Diverse Impacts of Spondylus along the Coast of South America*

From Ecuador to northern Chile, the Andean coast was home to diverse polities that have been studied by both archaeologists and historians. These studies have provided extensive datasets for interpreting coastal political economies, but research often emphasizes models developed for the central Andean highlands. Due to differences in environmental factors and sociopolitical organization between the coast and the highlands, in this session we would like to prioritize data and models from diverse coastal polities. From AD 700 to 1570, the Andean coast was home to a variety of different groups that had distinct political economies, but each polity was shaped to some extent by interactions with other coastal groups and access to marine resources and coastal trade. Studies of Andean political economies utilize a wide range of datasets that include analyses of material culture (such as architecture, metal artifacts, and ceramics) and studies of Spanish chronicles, census data, and legal documents. In this session we will unite research on currency, value, storage practices, exchange, the organization of craft production, hierarchy, and sociopolitical strategies. Through exploring archaeological and historical research, we hope to better reconstruct broad trends and shifts in coastal Andean political economies and long-distance exchange.

**Carvajal Contreras, Diana**

[5]

*Moderator*

[114]

*Chair*

**Carvajal Contreras, Diana**

[114]

*Recent Archaeological Research in Gorgona Island, Colombia*

This research, framed within the problematic environmental archaeology, aims to see the environments used by prehispanic settlers from the analysis of plant and animal remains. Zooarchaeological analyses of invertebrates describe a rocky, sandy, mixed intertidal environment typical of the Pacific Ocean. In the case of vertebrates, a lizard element (*Lacertilia*) was reported that suggests terrestrial environments of trunks, branches, and soil leaf litter. On the other hand, phytolith analyses suggest the presence of arboreal vegetation associated with wood plants from forests and palms. Preliminary analyses of phytoliths suggest that at the earliest levels, there is the presence of arboreal vegetation. Additional information is required to discuss the precolumbian diet but also to talk about these environments. However, these initial data contribute to the discussion on human adaptation in tropical island environments.

**Carvalho, Milena (University of New Mexico; ICArEHB, Universidade do Algarve), Grace Ellis (Colorado State University; ICArEHB, Universidade do Algarve), Michael Benedetti (University of North Carolina Wilmington; ICArEHB, Universidade do Algarve) and Jonathan Haws (University of Louisville; ICArEHB, Universidade do Algarve)**

[47]

*Neanderthals and Early Modern Humans in Western Iberia: Diet and Ecology at Lapa do Picareiro (Central Portugal)*

In Iberia, potentially the last place where Neanderthals survived, the demographic breakdown of small, loosely connected populations seems to have been a significant driver for their demise. Human responses to the climatic fluctuations of the Late Pleistocene, particularly Marine Isotope Stage (MIS) 3, could be an explanation for the decreases in Neanderthal population size during this time; it may be that habitat fragmentation and environmental instability contributed to a demographic breakdown, resulting in small, secluded Neanderthal populations that remained for some time in refugia, even after the arrival of

anatomically modern humans in Europe some 40,000 years ago. Thus, understanding human responses to climate change during the Middle–Upper Paleolithic Transition is critical. In this paper, we present new zooarchaeological and stable isotopic data from levels JJ and GG at Lapa do Picareiro, one of a handful of sites on the Iberian Peninsula with end-dates for the Middle Paleolithic (~45–42 ka cal BP), and a rare early Aurignacian occupation (~41.1–38.1 ka cal BP), to reconstruct Neanderthal and early modern human diet and ecology. We then compare our results to what is known about Neanderthals and early modern humans in the Mediterranean region.

Carvalho, Susana [88] see Cebeiro, Adela

**Casana, Jesse (Dartmouth College), Madeleine McLeester (Dartmouth College), Nathaniel Kitchel (Dartmouth College), Jonathan Alperstein (Dartmouth College) and Carolin Ferwerda (Dartmouth College)**

[55]

*Archaeological Remote Sensing at Damariscove Island and Colonial Pemaquid, Coastal Maine*

The region around modern Boothbay Harbor, Maine, is home to some of the earliest English colonial settlement in North America, with the establishment of a fishery in 1604 at Damariscove Island, and the subsequent growth of a town and fort on the mainland at nearby Pemaquid. Despite a long history of eighteenth- and nineteenth-century settlement and much popular interest in the region's history, past archaeological excavations at these important sites have been challenged by the low visibility of cultural remains in these rugged coastal landscapes. This paper presents results of new collaborative archaeological investigations at Colonial Pemaquid and Damariscove Island utilizing drone-based lidar, thermal imaging, and near-infrared mapping, combined with exploratory terrestrial geophysics and pedestrian survey. These emerging technologies offer new insights into the preservation and extent of archaeological remains at these sites, offering a path forward for future investigations into early historical communities of coastal Maine and the colonization of northern New England.

Casana, Jesse [177] see Alperstein, Jonathan

Casana, Jesse [69] see Graves, Michael

Casana, Jesse [69] see High, John

Casana, Jesse [111] see McLeester, Madeleine

Casar, Isabel [20] see Somerville, Andrew

**Cascalheira, João (ICArEHB, University of Algarve), Joana Belmiro (ICArEHB, University of Algarve), Lino André (ICArEHB, University of Algarve), Roxane Matias (ICArEHB, University of Algarve) and Célia Gonçalves (ICArEHB, University of Algarve)**

[239]

*Fire-Cracked Rock in the Mesolithic Shell Midden of Cabeço da Amoreira (Muge, Central Portugal)*

The Muge Mesolithic shell mounds (Central Portugal) are known worldwide for their monumentality and extremely rich archaeological and paleoanthropological records. Although these sites have been studied for over 150 years, one (particularly numerous) category of artifacts has been repeatedly ignored: fire-cracked rock (FCR). Here we present new data on the presence and characteristics of quartzite FCR at the Cabeço da Amoreira shell midden, from where more than 90,000 of these artifacts were recorded during our recent excavations. Following previous experimental studies, we explore the presence of different patterns of use-alteration and heat fracturing of quartzite cobbles across the stratigraphic sequence. Given the diversity of functions that the site was used for (including burial ground, habitat, and shell midden), from ca. 8000 to ca. 7500 cal BP, information on FCR variability allows for a better understanding of the activities associated with the formation of the different features and midden accumulation episodes.

Cascalheira, João [47] see Belmiro, Joana  
 Cascalheira, João [212] see Bicho, Nuno  
 Cascalheira, João [102] see Gonçalves, Célia

**Case, Joey and Terry Powis (Kennesaw State University)**

[249]

*A Technological Analysis of Daub from a Middle Mississippian Period Site in Bartow County, Georgia*

Daub is clay used in the construction of wattle-and-daub houses that acts both as insulation and protection from the weather. Less emphasized compared to other materials recovered in the archaeological record, daub played an important part in the waterproofing of dwellings in the Mississippian period. Being made of clay, daub is not preserved unless it was fired during some catastrophic event. But when it is preserved, what can daub tell us about how Mississippian houses were constructed? How much energy and effort were put into its production? Is daub differently sourced from clay used to manufacture pottery? Was any temper added to daub to prevent it from cracking and shrinking once applied to the walls of the house? These questions related to composition, among others, will be addressed when discussing our investigation into a burned house dating to the thirteenth century (Wilbanks Phase) located near the Etowah Indian Mounds in North Georgia. Our petrographic analysis of daub fragments from the Cummings Site will address questions around sourcing of the clay material as well as the preparation and application of it to the house. Comparisons to houses at Etowah and the Long Swamp Site will be included.

**Casperson, Molly**

[62]

*Chair*

**Casperson, Molly**

[62]

*A Flood of Support: Collaborative Cultural Resources Management at the Willamette Valley Project, US Army Corps of Engineers*

The Willamette Valley Project (WVP) is a Corps-managed flood risk management system composed of 13 dams and reservoirs spread across six subbasins in the upper Willamette River watershed. The construction of the dam system occurred 1940–1969 and subsequent operation inundated lands indigenous groups had inhabited for thousands of years and settler communities for the most recent 200 years. The Corps succeeded in decreasing flooding in the Willamette Valley, but ultimately displaced several mid-twentieth-century communities, modified the environment, and altered access to many important resources. Human land-use patterns throughout the basin changed significantly as a result. The Corps is one of many management entities within the Willamette River watershed, and there are numerous stakeholders with vested interests in the physical manifestations of the long-term human use of the six subbasins. To effectively manage cultural resources across such a large land base and in such a unique environment, the Corps partners with academic institutions, tribes, other agencies, local communities, and the public. These cooperative research and management ventures aim to understand the complex history of the region as well as conduct work that is socially relevant and aligns with the spirit and requirements of the National Historic Preservation Act.

Casperson, Molly [62] see Futy, James  
 Casperson, Molly [62] see Keith, Mackenzie  
 Casperson, Molly [62] see Lancaster, JD

**Castañeda, Amanda (Wyoming State Historic Preservation Office)**

[241]

*Chair*

**Castañeda, Amanda (Wyoming State Historic Preservation Office), Charles Koenig (University of Wyoming), Larry Loendorf (Sacred Sites Research Inc.) and Julie Francis [241]**

*Recent Documentation Efforts at Greybull South, Wyoming*

Greybull South (48BH92) is a rock art site located along the east bank of the Bighorn River near Greybull, Wyoming. The site was first documented in 1951 as part of the Yellowtail Reservoir survey project, but the site gained regional notoriety in 1962 when large blocks containing petroglyphs were removed from the cliff wall and subsequently transported to what is now the Buffalo Bill Center of the West in Cody (then the Buffalo Bill Museum). Recent projects have documented the removed blocks with 3D photogrammetry and fieldwork was conducted to complete an in-depth documentation the important record of Indigenous rock art at the site. The presence of at least three different rock art traditions—Plains Ceremonial, En Toto Pecked, and Plains Biographic—demonstrates the reuse of this site within the Bighorn Basin landscape for an extended period of time and likely by different Indigenous groups. This paper summarizes the ongoing projects and presents preliminary results of the expanded iconographic inventory that will add to our understanding of rock art in the Bighorn Basin.

Castañeda, Amanda [130] see Koenig, Charles

**Castellano, Lorenzo (New York University) [235]**

*Agriculture in the “Land of Hatti”: The Politics and Ecology of Farming in Late Bronze Age Central Anatolia*

The Hittite empire is the first supraregional polity documented in the history of central Anatolia. The core of the Hittite polity, the “Land of Hatti,” extended on a landscape which could be regarded as particularly challenging to the establishment of a reliable and productive centralized agricultural system. The traditional Anatolian farming system relies on the timing and magnitude of the autumnal and spring storms, which are characterized by having a hectic behavior, resulting in unpredictability in agricultural production. The complex topography of central Anatolia, furthermore, determines a fragmented landscape, which makes communication and bulk trade over long distances difficult and promotes cultural fragmentation. In which way the Hittite polity confronted these structural limits imposed by the physical geography of the Anatolian Plateau? In this paper, I discuss the role that agricultural production played in both the establishment and collapse of the Hittite polity, based on a systematic review of the textual, archaeological, and archaeobotanical evidence of agricultural production in Hittite Anatolia.

Caster, Joshua [176] see Fairley, Helen

**Castillo, Karime (Bowdoin College) [133]**

*A Nineteenth-Century Furnace in Guadalajara, Jalisco, Mexico*

Tonalá and Tlaquepaque are the main centers of traditional glassblowing in Mexico today. While there are records of one glass furnace in the sixteenth century in Jalisco, the industry did not take root in the area until the early nineteenth century. The analysis of archaeological glass from colonial Mexico City shows that glassmakers followed the tradition inherited from Spain but adapting it to the local resources and making it their own. Historical documents of a nineteenth-century glass furnace in Guadalajara, Jalisco, show further technological changes as glassmakers incorporated more raw materials into their batches and attempted to make crystal-clear colorless glass. Combining ethnoarchaeological and historical sources, this paper discusses the way in which glassmakers in Jalisco diverted from the colonial tradition and began developing an independent industry at the time when Mexico was at the verge of becoming an independent nation.

**Castillo, Victor (Jagiellonian University, Poland)****[34]***A Historical Perspective on Population Patterns and Settlement Layout at Chajul, Guatemala, AD 1530–1821*

Archival records suggest that Chajul was the largest town in the Ixil region during the colonial period. Spanish chronicles emphasize that different polities and communities were merged into a single colonial settlement during the foundation of the town as a congregación during the sixteenth century. This information is also remembered in the oral tradition of the modern Ixil. The unusually large dimensions of the town's church—likely built during the sixteenth century—and the surrounding plazas (now dramatically transformed) support the argument that during the colonial period Chajul had a significant population. By analyzing historical records regarding changes in the demographics of Chajul, from the sixteenth to the nineteenth centuries, this presentation integrates archival evidence into the analysis of the layout and physicality of the colonial town of Chajul.

Castleberry, Cala [201] see Young, Heather

Castro, Jaycee [131] see Hutson, Scott

**Castro, Mariana (ISAW | NYU)****[141]***Archaeology of Mining in Central Asia: Current Projects, Approaches, and Limitations*

The archaeology of mining in ancient Central Asia has long interested Russian-speaking archaeologists and geologists. Already in 1917, for example, Veber recognized Central Asia as a fertile ground for archaeological inquiry concerning pre-modern mines. Yet, perhaps due to remoteness and political setting, the research produced in this region has not been widely disseminated in western scholarship. More recently, a renewed interest in this field has led to the development of several major international projects that aim to narrate the process of mineral resource extraction among past Central Asian communities, thus greatly contributing to a better understanding of their economy, technology, and ingenuity. This paper explores the history of mining research in premodern Central Asia, focusing especially on the latest approaches and collaborations in the field. It also provides a case study of the ongoing research project on the extraction and exchange of turquoise stones in the inner Kyzylkum desert in Uzbekistan, where this stone has been extracted since prehistoric times. This example also provides a pertinent illustration of the limitations hindering ancient mining research in Central Asia, including the increasing reliance of post-Soviet states on mineral resources and the current difficulties of accessing scientific records in Russia.

**Castro, Mark (Cal Poly Humboldt Cultural Resources Facility), David Bruner (Cal Poly Humboldt Cultural Resources Facility) and Nick Angeloff (Cal Poly Humboldt Cultural Resources Facility)****[117]***Integrative Approaches to Anthropology Degree Marketability: Resources and Testimonials for Nonacademic Career Fields*

The Cultural Resources Facility at Cal Poly Humboldt integrates training and employment in cultural resource management with the more traditional academic-themed archaeology courses. The CRF trains undergraduate students in project compliance with historic preservation laws and regulations under federal, state, and local jurisdiction. Students receive experience in archaeological surveying, GIS, remote sensing, site mapping, excavations, artifact analysis, historical research, heritage interpretation, and ethnographic consulting. In this paper, we will discuss the ways that CRF works with the Department of Anthropology to make Cal Poly Humboldt graduates viable candidates for CRM firms. It will also highlight student career track benefits through a series of alumni testimonials, and discuss resources outside of Cal Poly Humboldt that our alumni have found particularly useful in pursuing nonacademic positions.

Castro-García, Yira [200] see Gastelum-Strozzi, Alfonso

**Castro Montes, Diana Patricia (Universidad Pablo de Olavide) and Blanca Maldonado (Colegio de Michoacán)**

[13]

*Traces of Prehispanic Primary Smelting in Present Traditional Copper Work from Santa Clara del Cobre, Mexico: Historical and Ethnographical Evidence*

The Tarascan Empire had become the most important prehispanic metallurgical center in Mesoamerica by around 1450 CE, with copper being the most commonly used metal to manufacture a variety of sumptuary objects. These artifacts were used as symbols of social and political elite status, as well as in religious ceremonies and other rituals. Some utilitarian implements such as needles and hooks were also manufactured during this period. Unfortunately, we have no concrete records on Tarascan metallurgical production in Michoacán. After the Spanish conquest, the main source of copper in New Spain continued to be located in the Province of Michoacán. When the colonizers assumed control of the local copper industry, they recruited indigenous miners and smelters, who for decades performed metallurgical techniques. The limited evidence suggests that during the colonial time, this procedure was based on indigenous knowledge, but more research is needed to affirm it, ultimately. The evidence suggests that the current melting method used in Santa Clara del Cobre has some prehispanic elements that persisted in time from the smelting process used during Tarascan Empire and colonial times. Historical and ethnoarchaeological data support this finding.

**Cathcart, Danielle (RGA Inc.) and Suzanne Spencer-Wood (Oakland University)**

[138]

*Public/Private Consumption in the Performance of Respectability and Gentility at 71 Joy Street, Boston, MA*

71 Joy Street was home to several free Black families in the mid-late nineteenth century followed by working-class white tenants into the early twentieth century. Evidence of their daily lives and identity performances was discovered in a privy sealed after approximately 75 years of continuous use. The objects speak to the public and private dimensions of urban life in Beacon Hill: the heart of Boston's free Black community until the turn of the twentieth century. The ability of the residents to deploy consumer goods in performances of gender, class, and racial identities is visible in patterns observed in the artifact assemblage. Strategies for maintaining a sanitary environment and healthy lifestyle, encoded in prevailing scientific theories of disease and contemporary etiquette manuals, are also instrumental in the performance of respectability and refined gentility. Such performances were instrumental in the community-wide struggle for equality led by resident activists, including individuals associated with 71 Joy Street. Black feminist intersectionality theory on the relationships between racism and sexism explains why Black women were considered primarily responsible for materializing their community's respectability through their dress and maintaining clean well-ordered homes, including their yards, although etiquette manuals also identified and promoted men's respectable dress and behavior.

**Caves, Meghan (University of Idaho; Umatilla National Forest—Pomeroy)**

[147]

*Chair*

**Caves, Meghan (University of Idaho; Umatilla National Forest—Pomeroy)**

[147]

*Privy to the Details: Biographies of the Teager/Weimer Site (45SN409) in Arlington, Washington*

This paper represents the culmination of master's thesis research on identity negotiation in the urbanizing frontier of Arlington, Washington. During the summer of 2021, I reanalyzed the privy assemblage associated with the Teager/Weimer site, which was originally excavated during cultural resource mitigation in 2008 and is now held at the Burke Museum in Seattle. In conjunction with the local pioneer and genealogical societies, I also conducted in-depth archival research. From these additional analyses, new details surrounding the social

and family dynamics of three families who occupied the site from ca 1895 through the 1930s have surfaced. Using the biographical approach, I have crafted narratives surrounding specific artifacts from the assemblage that are deeply contextualized within their likely social context specific to each family. These families' stories broadly draw on themes of capitalism, gendered domesticity, and nationalism within the larger colonization and urbanization frameworks of the American West. This work exemplifies the ongoing utility of legacy collections and value of public engagement in conducting meaningful archaeological research.

Caves, Meghan [234] see Marquardt, William

Cearley, Daniel [57] see Connell, Samuel

**Ceballos Pesina, Xanti (University of Arizona)**

**[64]**

*The Distribution of Early Ceremonial Complexes beyond the Maya and Olmec Areas Examined through the Analysis of Low-Resolution Lidar Data*

Recent work by the Middle Usumacinta Archaeological Project (MUAP) identified over 400 standardized ceremonial complexes within the Maya and Olmec areas dating to the Middle Preclassic period (1050–400 BC). According to this research, the spread and development of these centers likely resulted from intensive interregional interaction. This paper builds on this previous research and expands the study area to include the states of Veracruz, Chiapas, and Oaxaca. The main goals are (1) to determine the regional distribution of Preclassic centers and (2) to examine the transition in settlement patterns from the Middle Preclassic to the Classic period in these areas. Methods include the analysis of low-resolution lidar data obtained by the INEGI, incorporating both previously and newly identified ceremonial centers and archaeological features.

**Cebeiro, Adela (New York University), Johanna Neufuss (Blue Cross for Pets), Roman Wittig (Taï Chimpanzee Project, Centre Suisse de Recherche), Susana Carvalho (Primate Models for Behavioral Evolution Lab) and Alastair Key (University of Cambridge)**

**[88]**

*(Nut) Cracking the Code of Primate Cognition*

The use of percussive actions to access encased foods—e.g., nuts—has been proposed as a viable hypothesis to explain the emergence of stone tool technology in the hominin lineage. Observations of extant nonhuman primates such as chimpanzees (*Pan troglodytes*) or black-striped capuchins (*Sapajus libidinosus*) nut-cracking have been used to support the aforementioned hypothesis. However, there are no systematic cross-taxa comparative studies looking at the cognitive abilities required to undertake foraging percussive behaviors—e.g., nut-cracking—and early knapping techniques. Here, we computationally measure the structural complexity of chimpanzee and bonobo nut-cracking using context-free grammar (CFG) modeling and compare it to early stone tool percussive behaviors. Nut-cracking data were obtained from chimpanzee groups at Bossou (Guinea) and the Taï Forest (Côte d'Ivoire), as well as bonobos (*Pan paniscus*) from the Lola ya Bonobo sanctuary (Democratic Republic of the Congo). Stone tool experiments were run with present-day human knappers replicating the earliest percussive techniques: passive hammer, bipolar, and freehand knapping. Results suggest that the cognitive abilities involved in the manufacturing of early stone tools are distinct to those required to crack nuts. Nonetheless, differences between nut-cracking and the passive hammer technique seem to be less pronounced.

Ceppek, Michael [124] see Hard, Robert

Cera, Katherine [44] see McKee, Brian

Cerasoni, Jacopo Niccolo [214] see Hallett, Emily

**Cerezo-Román, Jessica (University of Oklahoma), Megan Walsh (University of Oklahoma) and Jane Buikstra (Arizona State University)**  
[205]

*Cremation Mortuary Practices during the Archaic Period in Ancient Athens and Attica*

In this paper, we provide preliminary results for reconstructing cremation mortuary practices from the Archaic site of Phaleron (ca. 750–480 BCE), located in Athens, Greece. We build on performance theory and embodiment ideas to answer two main research questions: (1) Who were the cremated individuals? and (2) How were cremation mortuary rituals performed? We do this by reconstructing the biological profile of individuals, examining thermal alterations, burial construction, and broader archaeological information from the site. Preliminary results highlight the variation in cremation rituals between different individuals. Some individuals were highly burned while others were not, suggesting different levels of pyrotechnological efficiency and/or resource accessibility. Additionally, the necropolis of Phaleron was an active space where people buried and memorialized their dead in many different ways. This research project emphasizes the benefits of exploring cremation rituals within a holistic view, considering the decedent and how their mourners and community treated the individual at death.

**Cerone, Jordan (Gettysburg College) and Heather Fusco (Gettysburg College)**  
[44]

*A Comparative Analysis of Nineteenth- and Early Twentieth-Century Ceramics in Gettysburg, Pennsylvania*

This poster examines the value of ceramic analysis as a tool for understanding the relative socioeconomic statuses of the residents of the “Janitor’s House” at Gettysburg College. In summer 2022, we cataloged and recorded ceramic shreds excavated at the Janitor’s House in fall 2021. This collection was then compared with two local houses thought to be occupied at roughly the same time: the Riggs and Monroe-Diggs Houses. The Riggs house, while owned by a different family, was occupied by Alexander Riggs and his family starting in 1860 and was located on the edges of town; while the Riggs were white Americans, their house was used by Confederates during the war like the Janitor’s House. The Monroe-Diggs house was a residence in Gettysburg built in the early nineteenth century which was primarily owned by African Americans—Clara Diggs, Elizabeth Butler, and Richard Monroe—until its demolition in the mid-twentieth century; most of the artifacts found in this extensive archaeological excavation can be traced back to these families. This poster presents the results of our comparative analysis and provides some interpretations of the relative wealth and statuses of late nineteenth- and early twentieth-century Gettysburg College janitors based on their ceramics.

**Cervantes Quequezana, Gabriela (University of Pittsburgh)**  
[12]

*Chair*

**Cervantes Quequezana, Gabriela (University of Pittsburgh)**  
[12]

*Political Economy in the Multicentric Sicán City, Peru*

Sicán political economy can be analyzed using the staple and wealth finance approach; in this talk I’ll focus on the latter. Interpretations about Sicán’s economy and exchange have been until now based mainly on the study of elite funerary contexts in the Sicán Core and ample craft production outside the city. In this talk, evidence of permanent residential patterns is presented, extending over a large area with a total of eight demographic districts, each with diverse craft production activities. I consider that craft production, particularly metallurgy, was the critical source of wealth, prestige, and power in the Sicán city and probably the Sicán polity. I propose that elites from District D acquired political and economic prestige during the Early Sicán period and they were the most powerful and prestigious group in the Sicán city during Middle Sicán. Lineages from District D crafted their symbols of power in metal objects, shrines, and ancestor tombs that became their means for political legitimization.

**Cesaretti, Rudolf (Arizona State University)****[27]***Refining the Regional Ceramic Chronology of the Postclassic Basin of Mexico to Account for Spatial-Temporal Variability*

The archaeology of the Postclassic (ca. AD 900–1520) Basin of Mexico (BOM) is among the most intensively studied in the New World. In spite of this, long-standing questions about population dynamics and social change remain unresolved due to the persistent gaps and coarse resolution of its regional-scale ceramic chronology. Ongoing fieldwork and methodological advances since the 1980s have led scholars to propose refined chronologies for particular sites/subregions. Yet these refined local chronologies are often strikingly different in terms of chronological markers and their relative abundance through time. This has led to the recognition of considerable spatial and temporal variability in the BOM's Postclassic ceramic sequence—only the broad contours of which have been outlined. To overcome the data gaps, this study analyzes an integrated database of over 3,000 excavation and survey collections (and associated radiocarbon dates) from over 500 sites across the region. The resulting regional chronology models the changing geographical contours of ceramic assemblages through time by incorporating established chronological methods into a spatially-explicit Bayesian analysis anchored to dated/excavated ceramic sequences. Not only does the model more than double the regional-scale chronological resolution, analysis of the database offers strong evidence on key issues such as post-Toltec northern population collapse.

**Cesario, Grace (University of Iceland)****[173]***The Importance of Specialized Use Sites in the Settlement History of Iceland*

Sandvík, located in the Westfjords of Iceland, seems to have been a seasonally utilized site focused primarily on winter fishing and fish processing. The site is situated directly on the coast, quite near to the main farm of Bær, and dates to very early in the settlement period of Iceland, which began around AD 877. Even though it was only used for a short time it may have been visited during other times of the year as well. The marine fish signature at Sandvík indicates that the gadids they caught were being processed into a dried product and sent off elsewhere for consumption. This highlights the importance of such specialized sites for the provisioning of others, especially during the earliest periods of settlement while farms are still being set up. Recent research on similar kinds of sites has shown that, while they may not persist for the long-term, sites such as Sandvík were vital to the process of building up society.

Chachapoyas, Alan [134] see Witt, Rachel

**Chacon, Richard (Winthrop University)****[213]***Discussant*

Chadwick, Rylee [121] see Hackenberger, Steven

**Chagoya Ayala, Itzel (Escuela Nacional de Antropología e Historia)****[91]***Los temazcales de Cerro Jazmín, evidencia de uso práctico en la Mixteca Alta*

Al temazcal o baño de vapor de tradición prehispánica se le ha asignado connotaciones religiosas y medicinales, en algunos sitios mesoamericanos ha sido localizado en centros ceremoniales asociados a juegos de pelota, basados en construcciones significativas y representaciones pictográficas que dan muestra de su forma y uso. Pero ¿qué sucede con los temazcales relacionados a la vida cotidiana?, los que se han registrado dentro de unidades habitacionales, en contextos sencillos cuyo uso principal se cree fue curativo. Para

investigar esta pregunta este trabajo expone dos temazcales excavados en Cerro Jazmín, sitio ubicado al extremo noroeste del Valle de Nochixtlán, Oaxaca, el cual estuvo habitado del Formativo tardío al periodo Posclásico (300 aC-1521 dC). Estos siglos de ocupación dejaron evidencia de las actividades realizadas en las que destacan los temazcales para su uso por una o dos personas, que podría ser para fines medicinales o en su defecto para uso familiar, finalmente el baño del temazcal sigue siendo una tradición en la región. La ponencia incluirá una discusión comparativa con otros temazcales, antiguos y modernos, que han sido estudiados en la región Mixteca.

**Chai Andrade, Travis (Princeton University)**

[101]

*Unsettling Settler-Colonial Archaeology: Constructing Indigenous Futurities at Pu'ukoholā Heiau*

Often thought of as a discipline that concerns itself with ruins—that which is in the past—archaeology also serves the settler-colonial project, in the present and the future. For that reason, archaeology inherently functions as a political tool, even if typically imagined as an apolitical means of “preserving” the past. In other words, archaeology offers settler-colonial states a means of maintaining a national origin story—the establishment of national identity—through narratives of pasts and futures distant and alien to quotidian life in the present. But in the case of Indigenous archaeology, this leads to an unsettling paradox: how can archaeology construct Indigenous futures if the historicization of sites serves a colonial and thus political purpose? Pu'ukoholā Heiau, one of the last traditional political temples constructed in Hawai'i, offers an interesting case study to understand this paradox. Through a Kanaka 'Ōiwi (Native Hawaiian) methodology put forth by Noelani Goodyear-Ka'ōpua, I analyze this temple to illustrate how archaeology can function not just as future-oriented but also as futurites-enacting. Demonstrating how contemporary ceremonies at *heiau* create *ea* (sovereignty) and *lāhui* (collective identity), I show how blending Indigenous and archaeological approaches has the potential to break settler-colonial historicizations and enact Kanaka 'Ōiwi futurity.

**Chakraborty, Kalyan Sekhar (Ashoka University), Andrew Roddick (McMaster University), Martin Scott (McMaster University) and Adrienne Lickers Xavier (McMaster University)**

[181]

*Fats and Oils: Toward a Collaborative Archaeology of Ancestral Haudenosaunee Foodways*

Archaeological analysis of Indigenous food systems in Southern Ontario has primarily focused on production and adaptation. Scholars tend to use models that focus on population, environment, and technology to predict and explain general changes in subsistence through time. This work, however, does not always include a partnership with Indigenous communities. A true partnership means dialogue at every step and an equitable, respectful, thoughtful, and transparent approach with Indigenous People (TRC 2016). In this poster, we discuss the initial results of a ceramic residue analysis and a true collaborative approach between archaeological scientists, anthropologists, and members from descendant communities. In this project we have prioritized questions that are important to community members, drawing on legacy collections housed at Sustainable Archaeology McMaster (Hamilton, Ontario). We discuss the problems using such collections for residue work. We present some details on culturally appropriate extraction protocols for what is often a rather destructive lipid residue analysis. Finally, we discuss our preliminary findings and how they speak to traditional food practices and support the food sustainability movement.

**Challis, Sam (Rock Art Research Institute, South Africa) and Andrew Skinner (University of South Africa, UNISA)**

[50]

*The Art of Survival: Mitigating the Impacts of PTSD and Combat Stress through the Manipulation of Moral Status and Identity in the Colonial-Era Rock Art of Southern Africa*

During the South African colonial period, settler incursion was met by indigenous resistance, sparking a series of brushfire conflicts. In the borderlands of the colony, “Bushman” bandits conducted an insurgency against colonists, facing as they did so significant traumatic stress. Being horse-borne was part of their identity, as was

their association with guns, and particular animals (baboons and ostriches) that embodied powers of protection. They included an alloy of identities who practiced trance dances to manipulate these powers and to heal the effects of disease. Post-traumatic stress disorder (PTSD) manifests in ways they would interpret as disease: nightmares, flashbacks, and social alienation caused by infection from malevolent spirits. In the trance state, used to heal such disease, the traumatic event itself becomes malleable, able to be shaped by the dimensions of who one is, and who their adversary is. PTSD's symptomatology, in turn, is shaped by the moral injuriousness of the event—whether it was just or deplorable will decrease or increase its intensity. Using art and trance to manipulate who they were, these bandits mobilized acceptance of violent narratives among themselves, and manipulated who their enemies were, framing violence as a grim necessity enacted against monstrous foes.

Chambers, Joseph [105] see Cook, Robert

Chamorro, Sebastian [201] see Huster, Angela

**Chan, Amy**

[196]

*Microscopic Fibers and Dental Calculus from Midnight Terror Cave, Belize*

The Midnight Terror Cave human remains collection consists of over 10,000 commingled bone fragments from at least 118 Maya sacrificial victims from the Classic period (250 CE–925 CE). Microscopic examination of dental calculus was carried out on a selection of teeth as part of a larger dental study. Calculus samples from three teeth from Operation V and three teeth from Operation VIII were sent to the PaleoResearch Institute for analysis where they were examined for pollen, phytoliths, starches, and other inclusions. Both samples were found to contain microscopic fibers, several of which were dyed blue. The fibers were ruled out as contamination and were likely incorporated into the dental calculus several days or weeks prior to death. Comparing the results to other dental calculus samples, a few possible answers exist as to how the fibers were introduced to the victims' mouths. The fibers could be from consuming a blue-dyed pulque. They could also have been introduced during utilitarian activities or through some form of dentistry. Another possible explanation is that the fibers were present after using gags as the victims were paraded from town to town, then to the sacrificial site.

**Chan, Annie (Ludwig Maximilian University of Munich)**

[79]

*Spatial Dynamics of Urbanization at the Onset of the First Turk Empire*

The contours of medieval urban transformation astride the Tarim-Tian Shan mid-latitudes are to a large extent viewed through the lens of religious iconography and Chinese political history. Thus, research is often directed at finds evincing the materiality of interregional cultural forms that demarcate routes of transmission conforming to purported topographical perimeters. Most notable examples include murals, religious buildings, and ornamental objects made of precious metals and textiles. This paper redirects the attention to the built environments that engendered some of these finds. It questions the social impact of space use as well as the spatial patterns of cultural change with respect to building form, function, layout, and site selection. The paper finds explanation for the character of cultural heterogeneity across the region's desert and montane steppes at the onset of the First Turk empire (late sixth–early seventh centuries) in syntaxes of built landscape that are the legacy of coterminous protectorates, kingdoms, and confederate groups of preceding centuries.

**Chan, Evelyn (Itza Project)**

[84]

*The Late Preclassic Monumental Foundation of Nixtun-Ch'ich', Petén, Guatemala*

The archaeological site of Nixtun-Ch'ich', Petén, Guatemala, exhibits urban planning different from “typical”

Maya cities. In addition to its urban density and gridded layout, it possesses large monumental architecture along its central axis that distinguished it as a prominent city during the Preclassic period. This axis includes a massive triadic group built during the Late Preclassic period, but with earlier antecedents. This construction broadcasted the city's prominence, as well as the presence of a community integrated in spirituality. The pattern is shared with other Preclassic cities indicating continuity in planning and design, which allowed for a common identity—at least loosely—perhaps facilitating social interaction. Many triadic groups, including that of Nixtun-Ch'ich', incorporated symbolism tied to cosmogony in their facades.

**Chang, Claudia, Sergey Ivanov (Kyrgyz National University) and Perry Tourtellotte (Independent Researcher)**

[141]

*Landscape Archaeology in the Juuku Valley on the South Side of Lake Issyk-Kul*

Since 2019 our team has conducted surveys of Bronze Age through Medieval sites in the Jukuu Valley, an intermontane region on the south side of Lake Issyk-Kul. Surveys have uncovered palimpsests of four millennia of land use. Radiometric dating, cultural historical sequences of site types, and mortuary remains have recalibrated the time-space systematics of this locality within the larger regional sequences. During the Wusun period of the Iron Age (late first millennium BCE/early first millennium CE) preliminary archaeobotanical and zooarchaeological evidence demonstrate a dual economy based on the herding of sheep, goats, cattle, and horses and the cultivation of barley, wheat, and the two millets at 1,600 and 2,100 m asl. Chinese historical sources document the central location of the Wusun state in the southern valleys of Lake Issyk-Kul. Preliminary GIS studies show a limited degree of co-location between the Saka and Wusun burial fields. Was there a politico-religious boundary between the earlier Saka nomadic confederacy and the later Wusun nomadic state? In 2022 we excavated a Wusun kurgan and a Wusun settlement to test our hypothesis on core-periphery relations. Our project also presents a new paradigm for decolonizing international field research in Central Asia.

**Chang, Melanie (Portland State University) and April Nowell (University of Victoria)**

[212]

*The Scientific Method in Paleolithic Archaeology*

Paleoanthropological hypotheses are often qualitatively different from questions asked by scientists studying the evolution of other living groups. They are frequently complex and very specific. Rather than seeking to illuminate basic evolutionary processes and mechanisms, they focus on precisely reconstructing events in human prehistory. They are often driven, at least in part, by public interest. These characteristics can enhance paleoanthropological studies because they foster novel research approaches, but they may also encourage the formulation of hypotheses that are essentially untestable given the available data. Perhaps for these reasons, explicit hypotheses are sometimes omitted or never clearly stated in paleoanthropological research papers, and many studies are essentially inductive or descriptive. Building on a pilot study, we conducted a survey of Paleolithic projects published in archaeological journals since 2000. We evaluated each study according to three criteria: (1) Is an explicit hypothesis stated? (2) Can the hypothesis be tested given the data that were examined? (3) Do the methods used in the study adequately test the hypothesis? We present chronological trends throughout the study period and compare results for different journals. We conclude with a discussion of the nature of Paleolithic archaeological studies and their status as a hypothetico-deductive discipline.

**Chanteraud, Claire (Missouri University Research Reactor), Brandi MacDonald (Archaeometry Lab at MURR), Diego Garate (Instituto Internacional de Investigaciones Prehistóricas de Cantabria), Hélène Salomon (Environnement Dynamique des Territoire de Montagne) and Iñaki Intxaurbe (University of Bilbao)**

[28]

*Taste for Color in Basque Land during the Paleolithic: New Approach for Description of Social Organization during the Gravettian*

Gravettian is a slice of human history that takes place during prehistory from 32 to 22 ka BP in Europe (from the Urals to the south of the Iberian Peninsula). This long period of our history was mostly built on lithic industries models with limited consideration for evidence of other technical and cultural practices, like coloring materials. Based on the selection of raw coloring materials during the Gravettian, we attempted to identify technical choice in graphic production as social distinction criteria for Gravettian human groups in Northern Spain (Basque Land). By using multiproxy methodology applied to raw coloring materials (earth pigments) found in four caves of the Lea Valley in the Basque Land, we identified specific selection (taste) in the diversity of materials available in the environment. These observations of specific taste for raw materials are not yet enough to propose a new view of social organization during the Gravettian, but it opens a new perspective in this field of research disconnected from the symbolic paradigm.

**Chapa, Reymundo (Center for Environmental Management of Military Lands)**

**[209]**

*Chair*

**Chapman, Larkin (University of New Mexico), Emily Lena Jones (University of New Mexico), Bruce Huckell (University of New Mexico) and John Southon (University of California, Irvine)**

**[179]**

*Contemporaneity of Humans and Horses in the Southwest during the Pleistocene/Holocene Transition? New Radiocarbon Dates from Two Sites in Southern Arizona*

Ventana Cave, AZ, and Murray Springs, AZ, have long been candidates for sites demonstrating spatial and temporal overlap between Paleoindians and extinct Pleistocene horses. However, this hypothesis has never before been tested using direct radiocarbon dating, rendering previous speculation ambiguous. AMS radiocarbon dates on horse bone from human occupation levels at these two sites provide insight into human-horse contemporaneity in the US Southwest during the end-Pleistocene. Compiling other radiocarbon dates on horse bone, we fit these new dates into a Bayesian summed probability distribution, providing a terminal date for horse persistence North America. This has considerable implications for hypotheses about megafaunal extinction in the Americas and provides new insights into the potential for human hunting of *Equus* in North America at the end of the last ice age.

**Character, Leila (University of Delaware), Timothy Beach (University of Texas, Austin), Takeshi Inomata (University of Arizona), Thomas Garrison (University of Texas, Austin) and Sheryl Luzzadder-Beach (University of Texas, Austin)**

**[54]**

*Broadscale Machine Learning Model for Archaeological Feature Detection in the Maya Area*

Comprehensive maps of ancient structures across the Maya area of Central America can help archaeologists to deepen knowledge of past settlement patterns and regional interactions, potentially leading to enhanced understanding of thousands of years of Maya civilization. However, most Maya archaeological sites are not comprehensively or systematically mapped because ruins, often hidden under dense subtropical forest canopy in rugged topographic settings, can take decades to map. Here we present the preliminary version of a broadscale multisite-based machine learning model for archaeological feature detection across 1,500 km<sup>2</sup> of the Maya area that will enable researchers to map sites in hours instead of decades. We find that a model trained on multiple sites across varied topographies produces better results than small, site-specific models, which are to date the only kind of models that exist for the region. Our model produced an F1 score of 0.80, and results also include many potential new structure detections. This approach suggests that a single machine learning model may be capable of broadscale mapping of Maya archaeological features across Central America. Such a model would be the first of its kind for the Maya area and demonstrates how big data can be integrated into traditional archaeological workflows.

**Charles, B****[169]***MicroCT, Maternal Health, and Stress at the Beginning of Life*

In Winona LaDuke's *All Our Relations*, the Mohawk midwife and environmental activist Katsi Cook declares that women are the first environment. Fetal growth and development correlate with the condition of that first environment. An infant skeleton with identifiable indicators of stress may hint to differential access to prenatal nutrition, maternal health, or other factors impacting pregnancy outcomes. However, bioarchaeologists have often avoided pathological studies of perinatal remains because the rapid new bone growth that typically occurs during this period is virtually indistinguishable from structures indicative of prolonged exposure to environmental stressors. MicroCT is a powerful nondestructive tool with the potential to distinguish between these osteological microstructures in the developing skeleton. This paper reviews recent studies that implemented MicroCT to investigate the microstructures of perinatal bone and considers factors that influence patterns of bone formation and growth in utero. Through MicroCT investigations of early life, we may also gain contextual insight on pregnancy in the past, and the lives of the women who experienced it.

Charolla, Breeanna [201] see Genord, Kayla

Charolla, Breeanna [131] see Simeonoff, Sarah

**Chase, Adrian (University of Chicago)****[165]***Grasping the Green Giant: The Epistemology of Ancient Maya Agriculture*

Agricultural production is a fundamental aspect of most societies, and research into agriculture has focused on invention, innovation, involution, intensification, and disintensification in varying forms worldwide. Generations of scholarship have accumulated knowledge and theorized about how agricultural systems function. Early research relied on Malthusian assumptions of population overgrowth and environmental determinism. However, significant social and technological changes over the last 200 years have led researchers to push against these boundaries and to study agricultural systems, smallholders, and landesque capital. These broader shifts have largely coincided with historical processes that include the widespread use of (and reaction to) specialized fertilizers. To a large extent, modern nitrogen fixation has underscored the importance of understanding the history of agricultural research and how perspectives have shifted on agricultural methods over time in relation to modes of production. Maya archaeology in particular has seen drastic changes in perceptions of past agricultural practices and in models of past agricultural production. Understanding the implications of these changes holds great value in reinterpreting ancient Maya settlement and overall sustainability.

Chase, Adrian [17] see Chase, Arlen

**Chase, Arlen (Pomona College)****[78]***Discussant***Chase, Arlen (Pomona College), Diane Chase (Claremont Graduate University) and Adrian Chase (University of Chicago)****[17]***Interpreting the Past: How Transdisciplinary Research Advances the Field of Maya Archaeology*

Human-nature relationships are key to understanding past societal developments. The value of conducting transdisciplinary research, involving new methods and other investigators, has become increasingly apparent as the field of Maya Studies has matured. While there has continued to be a significant increase in the collection of basic archaeological data relative to the ancient Maya, it is the application of transdisciplinary

approaches and newer technologies to these data that have significantly advanced our understanding of the past. Stable isotope and DNA analysis provide information on population composition and movement. Advances in chronometric dating have better situated past archaeological materials. And, remote sensing technologies, like lidar, have pushed archaeologists to better understand spatial data, forcing a reevaluation of older viewpoints relating to agricultural methods, population estimation, and urban adaptations. Using archaeological investigations from Santa Rita Corozal and Caracol in Belize, we provide examples of how new transdisciplinary collaborations are advancing our knowledge of the ancient Maya past.

Chase, Arlen [93] see Chase, Diane

**Chase, Diane (Claremont Graduate University) and Arlen Chase (Pomona College)**

[93]

*Scale and Political Integration of Ancient Maya Polities: Ideology, Frame Analysis, and Caracol, Belize*

Interpretations of ancient Maya society may be cast in different ways based on the bodies of data that are used and on the frame of analysis considered. New data and syntheses are changing what sometimes have been polarized perspectives. Excavation, survey, and particularly lidar data show both scalar relationships and regional variability on all levels, ranging from household to polity organization. Epigraphic data suggest that Maya royal power was deeply rooted in ideological beliefs, and when combined with archaeological data, it is evident that this power did not always penetrate the more pragmatic day-to-day organization of polities. Long-term archaeological research at Caracol, Belize, has permitted us to gain insight into polity integration. The archaeological work has generated a series of intersecting data classes that can be used to examine the spatial and material correlates for the organization, administration, and governance of this ancient city. These archaeological data demonstrate that different management strategies were in operation at Caracol over time. Evaluating these data using a frame perspective provides a more holistic perspective on the dynamic nature of Caracol's social, political, economic, and ritual organization.

Chase, Diane [17] see Chase, Arlen

**Chase, Zach (Brigham Young University)**

[50]

*Sight Formation Processes: Archaeology of Cultural and Sociohistorical Extromission and "Seeing Together"*

Despite insights from recent archaeologies of the senses, notions persist in the human and social sciences of vision as the invariant individual's passive reception of a phenomenally "given" world, while cognitivists posit a universal "visual grammar." In contrast, this paper asks how archaeology might draw on and contribute to the understanding that visual experience is a social and historical phenomenon, taught and learned through particular sociocultural processes wherein visual perception is necessarily complemented by "extromissive" expressions that resonate within shared visual traditions and shape ongoing visual experience. While many such expressions (spoken language, gesture/ostension) are ephemeral, others, like material culture, iconography, and architecture/spatial organization are the special purview of archaeology, which is likewise positioned to track these circuits of sight formation and change on both long-term and event-based scales. A modern-day vision of the Virgin of Guadalupe's image allows an ethnoarchaeological exploration of the sociohistorical, iconographic tradition shared by witnesses, and the spontaneous, decentralized creation of a shrine that indexically affirmed the abductive visual experience while also amplifying it temporally and socially. I conclude with the argument that intentionally eschewing metaphysics opens possibilities for applying these same insights to other pre/historic American archaeological sites and traditions.

**Chastain, Matthew (Stanford University)**

[202]

*Petrographic Analysis of CPAS Ceramics: Long-Term Continuity and Change in Chengdu Plain Pottery Production*

Although ceramic analysis is sure to be a critical line of evidence for understanding the development of

complex society in the Chengdu Plain (Sichuan province, China), only a small number of technical studies have been carried out on pottery from the region. Ceramic sherds collected by the Chengdu Plain Archaeological Survey team were therefore examined using petrographic microscopy in order to understand how pottery-making practices changed between the Neolithic, Bronze Age, and Han periods. The results indicate that potters used similar raw materials and paste recipes during both the Neolithic period and the Bronze Age. However, as the Chengdu Plain subsequently fell under control of the Qin and Han empires, local potters appear to have transitioned to the use of highly silty clays comparable to those found in the Qin and Han capital region to the north. These findings suggest (1) that elements of an indigenous pottery-making tradition persisted in the Chengdu Plain from the Neolithic through the Bronze Age and (2) that this potting tradition was ultimately supplanted as Sichuan was integrated into the Chinese cultural mainstream under Qin and Han.

Chauvet, Alain [21] see Spinelli Sanchez, Océane

Chavarria, Helen [160] see Verano, John

Chavez, Sergio [176] see Kennedy, Jason

Chavez, Stanislava [176] see Kennedy, Jason

**Cheek, Charles (Independent Researcher)**

**[52]**

*Women's Dress in Ritual and Non-ritual Contexts*

Dress is an important way people interact with others. Modern concepts of dress include the entire body and how people adorn or change it. Maya rituals use specific sets of dress elements to convey not only what is happening but also to ensure the ritual was done correctly. After a brief review of women's dress, I identify dress in ritual and non-ritual contexts to identify what elements occurred in each. Some elements seem generalized for any ritual and others not. I also examine how the ritual affected women's location in space at rituals and how politics affects that location. A case study at Yaxchilan looks at some changes over time as well.

**Chen, Jennifer (Pennsylvania State University), Lauren Canale, Jelmer Eerkens (UC Davis), James Watson (University of Arizona) and Randy Haas (Wayne State University)**

**[97]**

*Stable Isotope Analysis of Dental Serial Sections Suggests Delayed Weaning among Archaic Foragers of the Andean Altiplano*

Previous research identifies delayed weaning as a behavioral adaptation to life at high altitude in the Andean and Tibetan highlands. This research examines the stable isotope chemistry of dental serial sections in Archaic period forager populations of the high Andes in the Lake Titicaca Basin to estimate weaning ages and the potential onset of delayed weaning practices on the Andean Altiplano. Preliminary results suggest that Archaic foragers of the Altiplano, 9.5–6.5 cal kya, commonly delayed completion of the infant weaning process until 4–6 years of age. This estimate is later than both modern lowland weaning ages of 1–2 years and modern highland weaning ages of 3–4 years. Results suggest that delayed weaning was an early behavioral adaptation to high-altitude lifeways, which may have served to mitigate high infant mortality rates in a cold, hypoxic, resource-poor landscape.

**Chenault, Mark, Michael Stubing (Jacobs Engineering) and Ron Ryden (Independent Researcher)****[99]***Assessing the Utility of Large Excavators and Other Heavy Equipment for Archaeological Excavation*

Archaeologists conducting long-term data recovery excavations at Hohokam sites in western Phoenix, Arizona used a large excavator (track hoe) to remove the plow zone and overburden from above prehistoric features. After extensive analysis, the large excavator proved to be faster, more efficient, more cost effective, and, in the hands of an experienced operator, as precise as a backhoe for uncovering features in plan view. The large excavator was especially useful in exposing linear canal features and the lateral canals that branched from them. The track hoe was also efficient at uncovering other common features including pithouses, earth ovens, and even delicate features. With this study, we provide quantitative data showing the increased efficiency, including a cost comparison, of these types of heavy equipment for archaeological excavation.

**Cheney, Chelsea (Utah State University), Judson Finley (Utah State University), Erick Robinson (Boise State University), Molly Cannon (Utah State University) and Tim Riley (Utah State University Eastern Prehistoric Museum)****[198]***Fremont Legacy in Capitol Reef and the Waterpocket Fold: A Radiocarbon Analysis of the Pectol Collection Coiled Basketry Using Bayesian Modeling*

Perishable artifacts provide ample opportunity to understand the past, and radiocarbon dating is one area where artifacts constructed from annual plants can make a significant contribution. The analysis and dating of basketry from the Pectol Collection, an important collection of Fremont baskets from Utah's Capitol Reef region, aids in the development of a high-precision chronology for this area. We present new AMS radiocarbon ages on 18 Fremont coiled baskets using construction and design elements as prior information to constrain the age of different styles in the assemblage. We treat the basketry and its associated radiocarbon ages as a signal for local Fremont occupational intensity. We use these data to test the hypothesis that agricultural communities in the northern Colorado Plateau formed earlier but persisted for a shorter duration than those in the eastern Great Basin by comparing new ages to existing regional radiocarbon data.

Cheong, Kong [109] see Macrae, Scott

Cheronet, Olivia [214] see Tejero, José-Miguel

Chesson, Meredith [162] see Vazquez Fiorani, Agustina

Chicoine, David [177] see Golay Lausanne, Kayla

Childress, William [89] see Gingerich, Joseph

**Childs, S. Terry (Retired, Department of the Interior)****[231]***Moderator***[231]***Discussant*

**Chinchilla, Oswaldo (Yale University)****[85]***Discussant***[238]***Chair***Chinchilla, Oswaldo (Yale University)****[238]***Xibalba in Technicolor: The Popol Wuj and the Interpretation of Ancient Maya Art*

An enduring contribution of *The Maya Scribe and His World* was Michael Coe's call for attention to the Popol Wuj as a source for the interpretation of ancient Maya deities. Developed in subsequent works, this approach has yielded important insights on ancient Maya art and religion, and it has also influenced studies of the Popol Wuj. It transcended scholarly circles and became part of popular understandings of ancient Maya art and the Popol Wuj. Yet Coe's approach has been repeatedly contested, to the extent that some scholars question its heuristic value, casting doubt on all or most interpretations of ancient Maya religion based on the Popol Wuj. In this paper, I examine the long sway of Coe's insights on interpretations of ancient Maya deities, highlighting their many productive outcomes and weaknesses, and suggesting ways to build on Coe's valuable insights, first outlined in *The Maya Scribe and His World*.

**Chiou, Katherine (University of Alabama)****[78]***Discussant***Chiou, Katherine (University of Alabama), Araceli Aguilar-Meléndez (Universidad Veracruzana, Mexico), Christine Hastorf (University of California, Berkeley), Andrés Lira-Noriega (Instituto de Ecología, Mexico) and Emiliano Gallaga (Universidad Autónoma de Chiapas, Mexico)****[223]***Peppers and People in Mesoamerica: A Multidisciplinary Approach to Tracing the Origin and Domestication of Chiles (Capsicum annum var. annum L.)*

Dolores Piperno's career has been defined by pioneering work in multidisciplinary and collaborative plant research. Following in her footsteps, this interdisciplinary team comprised of archaeologists/ archaeobotanists, an ethnobotanist, and a biogeographer assembled to investigate the origins and domestication of *Capsicum annum* var. *annuum* L. and the cultural relationship between the *Capsicum* genus and Mesoamerican peoples over time. Using multiple lines of evidence including (1) morphometric analyses of modern and archaeological *Capsicum* seeds, (2) ecological niche modeling over the past 20,000 years, and (3) diachronic geospatial distributions of registered archaeological sites in modern-day Mexico, we identified potential locations where people would have initially encountered the wild progenitor *C. annum* var. *glabriusculum* L.—jumpstarting the complex process of domestication that led to the rise of the quintessentially Mexican chile pepper *C. annum* var. *annuum*.

Chiou, Katherine [124] see McGill, Dru

Chiou, Katherine [99] see Ranum, Caleb

Chistofani, Robin [143] see Arakawa, Fumi

**Chitwood, Anna and Dana Bardolph (Northern Illinois University)****[43]***Paleoethnobotanical Analysis of a Classic Taino Ritual Site at Cinnamon Bay, St. John (AD 1000–1490)*

This poster presents preliminary analysis of paleoethnobotanical data from excavations at a Classic Taino site

(AD 1000–1490) located at Cinnamon Bay on St. John, US Virgin Islands. Excavations began in 1992 when it was determined that the site was at risk of being lost to erosion. Until now, there has been no analysis of the paleoethnobotanical samples taken from the site. The goal of our study is to fill in the gaps of ritual foodways, offerings, and other ethnobotanical practices, such as medicinal or technological use of plants by the people who frequented this site prior to European conquest. In the Caribbean, limited macrobotanical studies have been conducted due to concerns about the level of preservation. However, the studies that have been completed have produced important insights into plant use by past Caribbean peoples, and our purpose is to eventually integrate the paleoethnobotanical data from Cinnamon Bay with existing zooarchaeological data from the site.

**Chiu, Scarlett (Academia Sinica, Taiwan), Christophe Sand (Institut de recherche pour le développement), Yuyin Su (Academia Sinica, Taiwan) and David Killick (University of Arizona)**  
[166]

*Reconstructing Ancient Pottery Transfer Patterns through Petrographic Analysis: A Case Study of New Caledonian Lapita Pottery Assemblages*

Humans first arrived in New Caledonia during the Lapita seaborne expansion from New Guinea to Tonga between 1250 and 800 cal BC. We use stylistic and petrographic analyses of Lapita pottery to study social relationships among Lapita communities. New Caledonia has a large island (Grande Terre) with complex geology, surrounded by coral islands (including the Loyalty Islands and Île des Pins). Although New Caledonia was likely settled from the northern basaltic island chain of Vanuatu, no pottery made there has yet been identified in New Caledonia. We are able to distinguish several discrete networks of pottery exchange between Lapita communities. The Loyalty Islands rarely imported pottery from Grande Terre, but Île des Pins at the southeastern tip received pots mostly and continuously from the Diahot River valley of Grande Terre, at least 400 km away, in a long-distance relationship that lasted over hundreds of years. Goro received pots mostly along the north coast, yet rarely imported from the Diahot River Valley. All of these new lines of evidence have changed our understanding of the past Lapita communities in this island group, and forced us to recognize the complexity of ties between Lapita communities.

Chocktoot, Perry [98] see Connolly, Tom

Chong, Donghee [152] see Park, Gayoung

**Chovanec, Zuzana**

[8]

*Archaeology and Organic Residue Analysis: Formulations, Considerations, and Interpretations in Researching Psychoactive Substances*

Over the last 30 years, organic residue analysis has transitioned from the occasional experimental project to a key component of scientific archaeological investigations. Methodologies have advanced, frequencies of studies have increased, and the range of investigated substances and characterized biochemicals expanded. Still, in some circles, the great potential of ORA seems to have lost some of its promise where the scientific methodology has been emphasized over archaeological interpretation and anthropological framing. This is particularly problematic in the investigation of psychoactive and other prestigious substances where the pseudoarchaeology narrative reigns. This paper presents key considerations and guidelines in framing such investigations drawing on research on tobacco, opium, and perfumes.

**Christenson, Allen (Department of Comparative Arts and Letters, Brigham Young University)**  
[52]

*“Grandmother of Light, Mistress of Shaping”: Midwife Deities in Highland Maya Ritual*

According to the Popol Vuh, the first truly successful human beings were created from maize by the goddess

Xmucane: “The yellow ears of maize and the white ears of maize were then ground fine with nine grindings by Xmucane. Food entered their flesh, along with water to give them strength. . . . The yellowness of humanity came to be when they were made by they who are called She Who Has Borne Children” (Christenson 2007:194–195). Xmucane is the principal female creator deity, also known as Alom (“She Who Has Born Children”). This is the first, and only time, that she appears in the text without her male consort Xpiyacoc, or K’ajolom (“He Who Has Engendered Sons”). This is because only women can create human flesh through childbirth. Among modern highland Maya it is considered highly unlucky if a man even touches a woman’s grinding stones once they have been used to grind maize since this taints their ability to create the food that restores or regenerates the body, an exclusively female prerogative as only they can create human flesh in the womb.

**Christie, Jessica (East Carolina University)**

[16]

*Kahalu’u and Keauhou on Hawai’i Island as Living, Dynamic Landscapes*

This paper analyzes the *ahupua’a* Kahalu’u and Keauhou on the west coast of Hawai’i Island as living, dynamic landscapes applying methodologies from archaeology, ethnohistory, and heritage studies as well as the framework of memory. Kahalu’u and Keauhou appear to be an incredibly interesting archaeological landscape since they functioned as the island’s royal center where chiefly residences and state *heiau* (temples) were built from about AD 1600 on into the nineteenth century. Archaeologists documented precontact physical remains in the 1970s before the entire coastline was respatialized by tourism development. Hawaiian *mo’olelo* (oral histories) mention many chiefs by name and episodes from their lives; but it gets very confusing to connect them with any known specific place. My archaeological-ethnohistorical approach came to a dead end. Native Hawaiians create new *mo’olelo* through memory from their family lines and ancestors. Their cultural reconstructions do not match neatly with the archaeological data but present alternative truths of Indigenous knowledge. They connect with academic knowledge and today’s climate crisis with regard to land-based values condensed as *mā.lama ‘āina* (take care of the land that sustains physically, socially, spiritually). Academic research can have an impact by applying and disseminating this framework.

**Chu, Wei**

[136]

*Discussant*

[159]

*Chair*

**Chu, Wei**

[96]

*Landscape Learning during the Early Upper Paleolithic of Southeastern Europe*

The initial settlement of western Eurasia by anatomically modern humans is thought to have taken place in discrete dispersal phases ca. 50–40 ka ago. Here, lithic toolkits are thought to be linked to founding phases indicative of discrete, rapid, westward movements into and across Europe triggered by climate amelioration during the last glacial. Under such a model, these initial incursions are routinely thought to have set the stage for a more consolidated colonization for thousands of years to come. Here, using data from southeastern Europe as a case study, I will demonstrate that the first anatomically modern humans in Europe did not simply trek across the continent but made deliberate seasonal use of persistent places in the landscape. Rather, behavioral plasticity, technological solutions, and hybridization with indigenes set the stage for their sustained occupation of the continent for millennia to come.

Chu, Wei [171] see Schmid, Viola

Chu, Wei [159] see Soressi, Marie

Church, Mike [203] see Yi, Hailin

**Church, Minette (University of Colorado, Colorado Springs)**

[110]

*Discussant*

**Chyla, Julia (Faculty of Archaeology, University of Warsaw)**

[139]

*Landscape Context of Castillo de Huarmey*

Castillo de Huarmey, a Wari provincial center and elite necropolis, was one of the most important locations on the Middle Horizon (AD 650–1050) Huarmey Valley landscape. In my presentation, I will address issues concerning the location of the site on a macro scale in the entire Huarmey Valley, on a micro scale (the context of the Huarmey Valley delta), and the spatial relationships within the elite female burial chamber located beneath the mausoleum. With the use of digital methods, I will determine whether relationships can be demonstrated between the women buried in the burial chamber and whether the location of particular categories of artifacts can illustrate specific spatial patterns of burial. Furthermore, I will try to understand the relationship between the imperial mausoleum and other sites located in the Huarmey Valley, and possible ways of communicating between them to better understand the role of the site's landscape context.

Cienfuegos, Edith [172] see Ruiz, Judith

**Cifuentes, Gerardo (Universidad Nacional Autonoma de Mexico), Yosselin Angeles (Universidad Nacional Autonoma de Mexico), Andres Tejero (Universidad Nacional Autonoma de Mexico) and Mario Retiz-García (Colegio de Michoacan)**

[13]

*Near-Surface Geophysics in Jicalán, Mexico*

Near-surface geophysics has been widely used as a tool to determine the distribution of objects at depth with archaeological targets. To identify more specific objects, such as ovens and associated structures, the potential method of magnetometry, electrical resistivity tomography, and induced polarization are applied in the Archaeological Zone of Jicalán, Michoacán, Mexico. The results of this work are presented and indicate that the archaeological exploration sites that meet the conclusive characteristics of the three geophysical methods are indicative of probable smelting furnaces.

Ciomek, Katarzyna [28] see Palonka, Radoslaw

Cipolla, Craig [65] see Gallo, Tiziana

**Cipolla, Lisa, Daryl Basarte, Michael Zimmerman (Bridgewater State University), Anna Coon (Association for Washington Archaeology) and Bryandra Owen (Knight & Leavitt Associates)**

[105]

*Welcome to Goblin Town: Using Role-Playing Games for Education and Science Communication*

The emergent field of archaeogaming explores how people interact with gaming worlds. In this poster, we take a look at a subset of gaming, role-playing games (RPGs), and their potential for teaching archaeological concepts and critical thinking. We present three case studies of RPGs with archaeological themes that provide interactive narratives for players to experience. The first is the tabletop RPG, *Dungeons and Dragons*. *Welcome to Goblin Town* is a game played by archaeologists that explores issues such as looting, repatriation,

identity, diversity, and ethics in archaeology. The game is made publicly available by live-streaming through Twitch and YouTube. The second is a classroom role-playing simulation for teaching players the Section 106 process and the decision-making skills required for projects. The third is an RPG where student players take on the roles of well-known archaeologists, and pseudo-archaeologists, and guess their theoretical framework based on conversations. Through these examples we show how RPGs can be used to teach students and the public about archaeological methods, theory, regulations, and ethics.

Cipolla, Lisa [28] see Haynes, Gregory

Ciugudean, Horia [45] see Beck, Jess  
Ciugudean, Horia [102] see Symmonds, Molly

**Clark, Bonnie (University of Denver)**  
**[38]**  
*Moderator*

Clark, Bonnie [30] see Brown, Megan

**Clark, Geoffrey (Arizona State University) and Michael Neeley**  
**[47]**

*From Individual to Collective Burial in the Mesolithic of Iberia*

The transition from individual to collective burial underscores implicit, but poorly understood, changes in social organization within the Mesolithic and between the Mesolithic and the Neolithic. Mosaic in character, this transition is well marked in Cantabria and Portugal, less so in other regions of Iberia. Mortuary programs on the Peninsula are described and compared with the data from western Europe in an attempt to identify the general circumstances that explain why this transition occurred when and where it did, and the implications it had for the subsequent emergence of social complexity in the Neolithic.

Clark, Geoffrey [179] see Neeley, Michael

**Clark, Jeffery (Archaeology Southwest)**  
**[199]**  
*Chair*

Clark, Jeffery [229] see Smith, Jaye

Clark, Jeffrey [207] see Quintus, Seth

**Clark, Jessica, Danielle Waite (Bureau of Land Management), Steph Miller (University of California, Riverside), Brigitte Kovacevich (University of Central Florida), Travis Stanton and Traci Ardren (University of California, Riverside)**  
**[100]**

*Geosourcing and Geopolitics: Handheld XRF Analysis of Obsidian from Households in the Yaxuna-Coba Region*

This poster presents results of sourcing analysis of artifacts from Classic period Maya sites in Northern Yucatán and Quintana Roo from household contexts using handheld X-ray fluorescence (hXRF). Previous analysis by Danielle Waite sourced artifacts from Coba and Yaxuna from excavations by the Proyecto de Interacción Política del Centro de Yucatán and Proyecto Sacbé Yaxuna-Coba. The current research,

conducted by Jessica Clark, sourced 127 artifacts previously omitted due to COVID-19 lab restrictions from eight Classic subsidiary sites in the Yaxuna-Coba region. We show some Classic period households at subsidiary sites accessed highly diverse obsidian from nine distinct sources from Mexico and Guatemala. In the samples analyzed by Waite and Clark, Yaxuna and Ikil were found to have the highest diversity of sources. Analysis by Waite identified more Guatemalan obsidian sources than Mexican sources; this research, however, identified over twice as many artifacts from Mexican sources as from Guatemalan. The site of Ikil was particularly diverse, with eight sources attributed, which could be expected given its relationship with Chichen Itza. The diversity of obsidian sources in household contexts at both large and small sites in the Northern Lowlands demonstrates the complex nature of geopolitics in the region during the Classic period.

**Clark, Morgan (Brown University), Sheryl Luzzadder-Beach (University of Texas, Austin) and Byron Smith (University of Texas, Austin)**

**[236]**

*Water for the Keep: Hydrological Flow and Accumulation*

This paper will present the final results and interpretations of data collected from La Cuernavilla's *aguada*. Special emphasis is placed on new data collected through several types of soil and geoarchaeological analyses that crucially supplement the data that have already been presented. Previous presentations on this topic covered the ceramic chronology of the *aguada* and its dam, the dam's manner of construction, the magnetic susceptibility of the dam's soils, the *aguada*'s volumetric capacity, and the number of users the *aguada* could have sustained. New data now provide information about the elemental chemistry, isotope geochemistry, mineralogy, and carbon dating of the *aguada* and its dam. The combined data indicate that the *aguada*'s usage predates the construction of its dam. This earlier usage for the *aguada* likely reflects the results of initial quarrying. The construction of the dam, which was inferred to have occurred during a single phase, is now understood to be a particularly labor-intensive event, as soil analyses confirm that fill for the dam was collected from various areas. This occurred during the Early Classic, a key moment in La Cuernavilla's development that is defined by its definitive transition to a large-scale defensive settlement in the context of siege warfare.

**Clark, Tiffany (PaleoWest LLC) and James Potter (PaleoWest)**

**[201]**

*Patterns of Faunal Procurement and Consumption at the Mission Santa Clara de Asís Ranchería (CA-SCL-30H)*

Excavations at the ranchería at Mission Santa Clara de Asís (CA-SCL-30H) yielded a large and well-preserved faunal assemblage. Using data from the analysis of these remains, this poster explores the domestic subsistence behaviors of the Native Americans who occupied the adobe structures at the mission. Although the predominance of cattle attests to the economic importance of domesticates in the Native diet, the abundance of small wild game suggests some continuation of traditional hunting practices. The low frequencies of large game and shellfish indicate that mission labor demands and possible restrictions in movement curtailed long-distance hunting and shellfish gathering forays.

**Clarke, Mary (Boston University)**

**[85]**

*Myth, Ritual, and the Classic Maya Sweat Bath*

Sweat baths have been used in Mesoamerica for more than a millennium for humoral medicine, childbirth, and obstetrics, not to mention rituals related to death, birth, and rebirth. During this long period of time, they have held a relatively constant place in mythology; they are ancestral grandmothers who generate and destroy a living population. While this is attested among contemporary, modern, and historic Maya communities, the myths and ritual uses remain less known for the Classic Maya period. The discovery of a unique sweat bath at Xultun, Guatemala, offers new insights into the religious associations of these structures, including their ritual use and associated deities.

Clasby, Ryan [124] see Hargrave, Eve

**Clay, Elizabeth (Central Connecticut State University)**

[169]

*Chair*

**Clay, Elizabeth (Central Connecticut State University)**

[169]

*Mapping Marronnage: Creating, Managing, and Visualizing Archival Datasets*

In the nineteenth century, captive Africans in Guyane, a French colony and overseas territory in northeastern South America, increasingly sought their own freedom leading up to definitive abolition in 1848. Colonial administrators recognized the practice as a problem and began systematically documenting instances of marronnage, thereby creating a rich archaeological data source. Records related to the act of running away—and oftentimes subsequently recapture and re-enslavement—include details unavailable in other archival sources for this time and place, including naming practices, personal adornment choices, presumed African places of origin, the materiality of nineteenth-century Guyane, and the physical scars of slavery, in addition to spatial information related to sites of enslavement and strategies of escape. In this paper, I discuss the process of creating data from these archival fragments and propose ways of visualizing the information to reconstruct social and spatial relationships. While marronnage was much more prevalent in neighboring Suriname, where long-standing maroon communities persist to this day, the archival record offers one of the only ways to illuminate the existence and extent of the practice in the French Amazonian context.

**Clayton, Lucia (University of Western Australia)**

[193]

*Moderator*

[193]

*Discussant*

**Clevenger, Aleesha (Archaeology Southwest) and Allen Denoyer (Archaeology Southwest)**

[199]

*Salado Projectile Point Technology at the Gila River Farm Site, Southwestern New Mexico*

This research examines the projectile point assemblage from the Gila River Farm site, a Cliff phase (AD 1300–1450) Salado site excavated by the Archaeology Southwest and University of Arizona Upper Gila Preservation Archaeology (UGPA) field school from 2016 to 2022. The projectile point assemblage was recovered from adobe structures and some non-feature contexts. We examine spatial patterns within the projectile point assemblage from this site, and also compare these data with results from other Salado archaeological sites. The results allow a better understanding of site and regional level patterns characterizing technological and social behaviors during this time period.

Clindaniel, Jon [246] see Splitstoser, Jeffrey

**Clinker, Susannah**

[229]

*Unravelling Mummy Objectification: An Evaluation and Case Study of the History and Legacy of Mummymania*

During the nineteenth and early twentieth centuries, wealthy Europeans flocked to Egypt to see the “exotic” and ancient land first-hand. On their journey, many tourists accumulated souvenirs, but none were so admired and desired as Egyptian mummies. The exploitative nature of European interest in Egyptian mummies meant little historical and personal information about each mummified individual was recorded or retained. The identities of many Egyptian mummies that were later donated to modern museum collections, were lost forever. This obsession with Egyptian mummies has been termed mummymania by many Egyptologists. The

unfortunate lasting consequence of mummymania is that Egyptian mummies have continued to be merely the focal point of museum collections, valued not as historically significant individuals but for their ability to pique the interest of the public as objects of curiosity. This presentation will present a brief overview of the difficult histories surrounding mummies and their acquisition into museums. By using the mummies in the Redpath Museum (McGill University) as a case study, I will demonstrate how evaluating the difficult histories surrounding mummies, and their acquisition into museums is indeed the first step in unravelling their objectification both in scholarly and public spheres.

**Clow, Zachery (San Diego State University), Issac Ullah (San Diego State University) and Juliette Meling (San Diego State University)**

[75]

*GIS Publishing Trends in Archaeology: How GIS Has Been Used from 1994 to 2021*

Geographic information system(s), GIS, have been used in the past to visually represent a dataset, perform basic computation analysis, or compile data. In recent decades this trend has shifted to incorporate a theoretical framework for thinking spatially about data across temporal scales. This was brought up recently by Locke and Pouncett (2017) who asked, "Is GIS the answer?" A two-phase survey was created to determine the frequency and use of GIS across the discipline. The first phase involved the search tool in Scopus to conduct three types of keyword searches for the term "GIS" within each journal going back to 1982: (1) "Title only," (2) "Title, Abstract, and Keywords only," and (3) "All fields." The second phase consisted of stratified random sampling of articles within a few key disciplinary journals, with an emphasis on impactful, long-lasting journals with historically elevated statuses as important publishing venues, including *American Antiquity*, *Journal of Archaeological Sciences*, and *Journal of Archaeological Method and Theory*. We created an annual sampling frame for each journal from 2021 to 1994 and randomly selected one issue from each year via a random number generator capped at the total number of issues published in that year.

Cobb, Charles [64] see Krus, Anthony

Cobb, Charles [86] see Sorresso, Dominique

Cobb, Peter [149] see Curtis, Caitlin

**Coben, Larry (UPENN and the Escala Initiative)**

[22]

*Homenaje a Clavos: Reflections on My and Other's Use of the Work of Charles Stanish*

In this talk, I reflect on the work of Charles Vandalay Stanish, and how his work has been imported and exported by scholars around the world. I focus in particular on how I have utilized Chip's obra in my own life.

**Coben, Larry (UPENN and the Escala Initiative)**

[110]

*Discussant*

Cochran, Jennifer [129] see Brown, M. Kathryn

**Cochrane, Ethan (University of Auckland), Seth Quintus (University of Hawaii), Matiu Prebble (University of Canterbury) and Ta'iao Matiu Matavai Tautunu (National University of Samoa)**

[207]

*Bottom-Up Data on Sociopolitical Complexity in Ancient Samoa*

Explanations of sociopolitical complexity are often linked to competition over the control of resources and changes in resource structure, including productivity, predictability, distribution, and other characteristics. These explanations also reference variables of human demography and the environment that may influence resource structure. In Samoa, with the exception of work on the small islands of Ofu and Olosega,

speculation on social and political change, the rise of chiefdoms, has proceeded without these kinds of data. In the spirit of Tom Dye's bottom-up approach to archaeological explanation, we examine one of the largest catchments in Samoa and summarize the most recent archaeological, environmental, and demographic data relevant to changes in social complexity. The earliest rock walls (boundaries or connecting paths) are monumental in size and contemporary with population increase inferred through analysis of modern DNA. Dating of additional features (small walls, terraces) and environmental variation indicates later changes to resource structure. We propose that changes in sociopolitical complexity in Samoa were kick-started by demographic variation.

**Coco, Emily (New York University) and Talgat Mamirov (A. Kh. Margulan Institute of Archaeology)**

[141]

*Investigating Stone Tool Recycling Behaviors in Surface Deposits in the Semizbugu Mountains, Kazakhstan*

The surface site complex of Semizbugu is a well-known Paleolithic site in Pribalkhash, Kazakhstan. Tens of thousands of artifacts from all Paleolithic periods have been collected from 11 different locations across this landscape between 1961 and 2013. During our 2022 field season, we conducted a new study at Semizbugu. We examined the distributions of recycled artifacts in these deposits to determine what conditions encourage recycling behaviors. We employed a new data collection methodology to document the spatial location of individual artifacts in multiple deposits. We analyzed over 3,000 artifacts from five different locations in the Semizbugu mountains. Each of the study areas contained recycled implements. Further analyses demonstrate spatially distinct associations between recycling signatures and other artifact characteristics among and within the study areas. The patterns of recycling at Semizbugu, therefore, indicate the presence of local-scale factors that cause areas of the landscape to be used differently in a recycling regime. This study proves that considering surface deposits is essential to further our understanding of recycling behaviors. This project represents an important first step to explore the range of conditions that promote recycling in order to build complete models for how this behavior functioned in the past.

Codding, Brian [97] see Contreras, Daniel

Codding, Brian [97] see McCool, Weston

Codding, Brian [27] see Moffatt, Maren

Codding, Brian [97] see Smith, Eric

Codding, Brian [97] see Vernon, Kenneth

Codding, Brian [97] see Wilson, Kurt

**Cody, Tia (Bonneville Power Administration) and Shelby Anderson (Portland State University)**

[62]

*Lidar Predictive Modeling of Kalapuya Mound Sites in the Calapooia Watershed, Oregon*

This presentation details the development, testing, and results of a lidar and remote sensing predictive model to locate precontact mound sites in the Calapooia Watershed in the Willamette Valley, Oregon. Not much is known about these mound sites archaeologically, including where they are located in the 234,000-acre watershed. Additionally the watershed is 94% privately owned, making traditional archaeological survey impractical. To address this problem, I used ArcMap, lidar data, and aerial photography to develop a Kalapuyan mound predictive model. Development of the model included filtering the lidar dataset to remove "noise"/ non-mound features, as well as inverting and digitally flooding the lidar dataset to identify inverted mounds. Testing included lab verification of the model's ability to identify previously recorded mound sites and a focused pedestrian survey of the project area to assess whether the model identified previously unrecorded mounds. Four land parcels were surveyed and 22 model-identified sites were visited, with seven sites verified as newly recorded Kalapuyan mounds.

Coe, Andrew [14] see Smith, Claire

**Coe, Marion and Edward Jolie (Arizona State Museum, University of Arizona)**  
**[248]**

*The Absence (or Presence) of Footwear during the Eastern Great Basin Archaic*

Excluding much younger examples of distinctive Fremont-era and Promontory Phase moccasins, footwear of any sort seems to be largely, if not entirely, absent from the archaeological record of the Eastern Great Basin during the preceding millennia. This apparent pattern stands in sharp contrast to the well attested and venerable woven sandal traditions evidenced by the archaeological records from points west in the Great Basin, and south on the Colorado Plateau, that go back over 10,000 years. This paper considers the evidence for footwear (or the lack thereof) from the eastern Great Basin by reexamining published accounts of sewn hide artifacts and Archaic sewn hide from the well-dated Bonneville Estates Rockshelter artifact assemblage. Is this absence of footwear in the literature more apparent than real? If absent, does this speak to long-term cultural preference or environmental conditions that made footwear unnecessary? If present but misclassified, are there cultural contexts influencing a preference for hide footwear over sandals in the eastern Great Basin?

Coffey, Grant [90] see Ermigiotti, Paul

Coffey, Grant [90] see Glowacki, Donna

Coffey, Grant [90] see Potter, James

Coffey, Grant [90] see Wilshusen, Richard

**Cohen, Anna (Utah State University)**  
**[86]**

*Potting Communities on a Purépecha Landscape, Angamuco, Michoacán, Mexico*

Documentation of the *chaîne opératoire* allows us to investigate the manufacturing steps that transform raw materials into finished products. Study of these steps can facilitate discussions about the intentions of ancient potters and potter communities of practice. In western Mesoamerica during the Late Postclassic period (AD 1350–1530), potters within the Purépecha Empire created imperial-style pottery with spouts and globular supports that were often decorated with polychrome coloration and resist firing treatments. These imperial-style vessels may have been created in a centralized location in the imperial core region. One way to examine these vessels is by focusing on the production chain of imperial-style vessels at a site within the core region that was occupied before, during, and after the empire developed in the Middle to Late Postclassic periods. Previous petrographic and geochemical work at the site of Angamuco (Michoacán, Mexico) indicates that ceramics, including imperial style vessels, were created from both local and regional raw materials, and that these raw materials did not change drastically for over 1,000 years (ca. AD 250–1530). Study of several production steps in the Angamuco pottery considers the possibility of multiple communities of potters who operated as an empire coalesced.

Cohen, Anna [94] see Cannon, Molly

**Coil, Reed (Nazarbayev University), Paula Doumani Dupuy (Nazarbayev University), Katherine Erdman (Nazarbayev University) and Madina Makulbekova (Nazarbayev University)**  
**[181]**

*Simulated Archaeological Site Development for Education and Outreach: A Case Study from Kazakhstan*

Formal training in archaeological field methods for undergraduate students in Kazakhstan is currently not widely available or well-funded. This reality often turns students away from archaeology. Over the past year, we planned, developed, and implemented the creation of a simulated archaeological site on the Nazarbayev University campus in Nur-Sultan (Kazakhstan). The primary goal for the creation of this space revolves

around training students in a controlled environment, where mistakes can be made without jeopardizing the archaeological record. Students can translate this experience to working on ongoing archaeological projects without the need to spend precious field time building core skills. Students in this simulation learn to excavate, record data, map archaeological finds, draw profiles, curate artifacts, and reconstruct the site using GIS and photogrammetry. As an ancillary goal, the excavations conducted on our campus provide a novel avenue into capacity building and public community outreach. Our ultimate aim is to foster interest and accessibility to professional and volunteer opportunities for archaeology in Kazakhstan, in turn leading to a development in research infrastructure and homegrown specialists; eliminating the dependency on foreign researchers for research practice and scholarly output.

**Cojti-Ren, Iyaxel (University of Texas, Austin)**

[158]

*Discussant*

**Cojti-Ren, Iyaxel (University of Texas, Austin)**

[93]

*The K'ab'awil, or Protective Deities, of the Maya Highlands: Symbols of Identity and Political Integration*

In the Late Postclassic period (AD 1250–1524), the deities called *k'ab'awil* had an important role in the formation of collective identities in the Maya highlands, together with the language and the territory. In the political field, the *k'ab'awil* were vital in integrating the peoples that fell under K'iche' rule and with whom they maintained dependency alliances. In the Late Postclassic, the K'iche' established several ideological mechanisms to stay in power and strengthen relations with their allies. Some of these strategies included the development of public ceremonial activities and the veneration of the main K'iche' *k'ab'awil* by the allies, which is related to the integration of K'iche' lineages in the sociopolitical organizations of other polities. In this presentation, I will present archaeological and historical evidence to show some of the ideological mechanisms that the K'iche' used to keep the social order and strengthen the alliances with their allies, including the Kaqchikel, Rab'inaleb', Tujal, and Tz'utujil, among others. I will provide evidence that would support the hypothesis originally proposed by Florine Sloane, who stated that the existence of double and twin temples in the highlands was an innovation of the K'iche' to manage the conquered polities.

Cojti-Ren, Iyaxel [228] see Adam, Manda

**Colaninno, Carol (Southern Illinois University, Edwardsville), Emily Beahm, Carl Drexler, Shawn Lambert and Cassidy Rayburn)**

[149]

*From Archaeological Students to Emerging Practitioners: Voice, Autonomy, and Agency as Field School Teaching Tools*  
[WITHDRAWN]

**Cole, Kasey (University of Utah), Jack Broughton (University of Utah), Lauren Hainsworth (University of Utah), Maren Moffatt (University of Utah) and Alex Shumate (University of Utah)**

[97]

*Ecological and Anthropogenetic Drivers of Artiodactyl Abundance and Distribution in Northeastern California: Implications for Social Signaling, Resource Intensification, and Resource Depression*

Variation in large-game hunting has long been viewed as a primary driver influencing many aspects of change in human behavior and biology worldwide. In western North America, variation in Holocene artiodactyl (e.g., bison, deer, pronghorn, bighorn sheep) hunting has often been examined from a behavioral ecological perspective to understand past foraging and land-use practices and related changes in human behavior, including settlement patterns, technological change, social signaling, large-scale resource intensification, and anthropogenic resource depression. However, rarely are past climate records and proxies of human

population density coupled with zooarchaeological estimates of artiodactyl abundance to evaluate the ecological and anthropogenic drivers of change over time. Here, we first evaluate how Holocene climatic variability and inferred human population density impacted artiodactyl abundance and distribution in northeastern California using modeled paleoclimatic reconstructions, distributions of radiocarbon dates, and faunal data representing more than 50 archaeological sites and >100,000 faunal specimens. These results offer a regional perspective on how ecological and anthropogenic drivers impacted spatio-temporal distributions of artiodactyls on the landscape. We then use these insights to understand past regional hunting and land-use practices, particularly related to arguments for social signaling, large-scale resource intensification, and anthropogenic resource depression.

Cole, Kasey [97] see Wilson, Kurt

**Collard, Mark (Simon Fraser University)**

**[226]**

*Chair*

**Collard, Mark (Simon Fraser University), Jonathan Harding (Simon Fraser University) and Dennis Sandgathe (Simon Fraser University)**

**[50]**

*Drivers of Clothing Variability among Ethnographically Documented Hunter-Gatherers: A Cross-Cultural Test of Competing Hypotheses*

Clothing is ubiquitous among living humans, and there is reason to believe it has been important for hominins for tens of thousands of years. Despite this, clothing has received little attention from scientific anthropologists. Consequently, there are some important questions about clothing use that have yet to be adequately addressed. One of these is, What drives the variation in the clothing of ethnographically documented societies? The study reported here sought to shed some light on this question. First, we developed a way of quantifying clothing variation based on Wendall Oswalt's method of analyzing subsistence toolkits. We then used the method to generate data for 50 hunter-gatherer groups. Subsequently, we evaluated the impact of a number of potential drivers of clothing variation, including ambient temperature, rainfall, snowfall, mobility, polygyny, and social class. Several variables were found to be influential when they were examined individually, but when the variables were analyzed simultaneously, the only ones that had an impact were temperature, windchill, polygyny, and class, with temperature being considerably more important than the latter three. It appears, therefore, that variation in the wardrobes of ethnographically documented hunter-gatherers was driven primarily by temperature-related variables and, to a lesser extent, by sexual selection and social signaling.

Collard, Mark [21] see Beller, Jeremy

Collard, Mark [45] see Buchanan, Briggs

Collard, Mark [226] see McCauley, Brea

**Collazzi, Charlene (Center for Digital Antiquity [tDAR]) and Rachel Fernandez (Center for Digital Antiquity [tDAR])**

**[124]**

*How Does tDAR Make Archaeological Data FAIR?*

Every archaeological site holds the potential to contribute its own irreplaceable piece into the vast jigsaw puzzle that is our shared human past. Meticulous field and lab procedures ensure data and subsequent reports are accurate. But what happens after the project closes? Usually, the report is filed away to idiosyncratic departmental standards: At best, available to limited audiences; At worst, vulnerable to catastrophic loss. While the site is gone forever, its data remains an invaluable tool for current/future researchers. Only by preserving, curating, and sharing data can we better understand the myriad complexities acting on societies across time and space. To this end, the Center for Digital Antiquity (CDA) advocates for

the FAIR Principles for Data Stewardship to be implemented as a mandatory standard guiding all archaeological data management efforts. FAIR asserts that data should be Findable (easily found via online search), Accessible (easily affordable, downloadable), Interoperable (easily synthesize multiple sources of research/data), and Reusable (easily cited for future use/collaboration). This poster highlights how CDA applies the FAIR Principles in its digital repository, The Digital Archaeological Record (tDAR), and affirms how FAIR empowers researchers to responsibly leverage cultural heritage data across academic, governmental, and cultural resource management entities.

**Colleter, Rozenn (Inrap [Paris, France]; SFU [Vancouver, BC, Canada]), Michael Richards (SFU [Vancouver, BC, Canada]) and Dominique Garcia (Inrap [Paris, France]) [252]**

*Social Inequalities by Diet in Archaeology: The Contribution of Isotopes*

Research about the biological impacts of social inequality is at the center of the humanities and social sciences. Social inequalities impact multiple determinants of health such as lifestyle, diet, and housing. Questions about inequalities, therefore, can be addressed by using isotopic data related to collected by archaeologists. This project compiles isotopic data from several thousand archaeological skeletons found in Europe from more than 455 sites, dating from late prehistoric to modern times. Nitrogen stable isotope values ( $\delta^{15}\text{N}$ ) in particular document the most protein-rich diets are associated with higher status. Comparisons between social groups can potentially be used to document the evolution of inequalities regionally and diachronically.

Collins, Matthew [240] see Bao, Yige

**Collins, Ryan (Dartmouth College), Deborah Nichols (Dartmouth College) and Ethan August (Dartmouth College) [125]**

*An Evaluation of Obsidian Projectile Point Chronology and Possible Sourcing in the Tehuacan Valley, Mexico*

Obsidian, a volcanic glass, was widely used in Mesoamerica for cutting tools, weapons, jewelry, and ritual objects since the Paleoindian period (ca. 9000 BC). Because its sources have unique chemical signatures, obsidian provides a durable and measurable index of interactions across space and time. Our research draws on the data gathered by The Tehuacan Archaeological-Botanical Project, directed by Richard S. MacNeish in the 1960s, to understand how exchange networks in Mesoamerica formed and transformed in conjunction with the development of urban society. MacNeish and colleagues collected over 3,000 obsidian artifacts from numerous caves and terrestrial surveys throughout the Tehuacan Valley; 114 diagnostic obsidian artifacts, including projectile points and knives, from the Robert S. Peabody Institute of Archaeology at Phillips Academy in Andover, Massachusetts, were subjected to nondestructive X-ray fluorescence (XRF) analysis with a Bruker Tracer 5i analyzer. From the sample, we have identified 11 (possibly 12) sources of volcanic obsidian. Our research shows that obsidian sources shifted over time, granting the foundation for considerable insights into long-term economic exchanges throughout early Mesoamerica. Significantly for Mesoamerica, there is no other well-documented collection of continuous obsidian artifacts spanning from the Paleoindian (ca. 9000 BC) through the historical (ca. AD 1521) periods.

Collore, Taylor [98] see Gonzalez-Tennant, Edward

**Coltman, Jeremy (University of California, Riverside) [238]**

*Chair*

**Coltman, Jeremy (University of California, Riverside) and Andrew Turner****[238]***Michael D. Coe and the Códice Maya de México (Grolier) Controversy*

The controversial display of *Códice Maya de México* at the Grolier Club in 1971 and its subsequent publication by Coe in *The Maya Scribe and His World* opens debate regarding archaeologists' involvement with unprovenienced objects. The sudden appearance of the previously unknown manuscript in the exhibition took Mesoamericanists by surprise and sparked bitter debate over its authenticity that lasted 46 years, largely because the object lacked archaeological context and the controversial nature of its exhibition caused many to react defensively. Though costly and time-consuming, the codex was recently authenticated and is now considered the oldest book of the Americas. While secretly removing the codex from Mexico clearly violated established protocols, one wonders if it would ever have been authenticated if its exhibition had not drawn so much attention, having previously been condemned as a forgery by two scholars with no particular expertise in codices. We argue that one possible solution is that prominent unprovenienced objects go through a more thorough evaluation process that involves independently working specialists that can determine if it should be subject to more rigorous analysis. Though looting is deplorable, labeling authentic objects as fakes is an equally destructive act that condemns them to oblivion.

Colton, Michael [134] see Schaefer, Benjamin

**Colwell, Andrew (NMSU)****[76]***Monkeys and the Maya: Zooarchaeological Analysis at Isla Civituk, Campeche, Mexico*

In my thesis, I examined the primate remains, *Ateles geoffroyi* and *Allouata pigra*, found at Isla Civituk, Campeche, Mexico, to understand the agricultural and sustainability practices of the Postclassic period (AD 1200–1525) in this area. I weigh evidence of contemporary human-primate relationships in the Maya region to understand continuity or change in the past. Through a taphonomic approach, detailed analysis of archaeological contexts, and systematic zooarchaeological identification of the remains, I explore variation in biodiversity and resilience in a lacustrine setting.

**Colwell-Pasch, Chelsea (Colbr Consulting Inc.) and Vanessa Sullivan (Colbr Consulting Inc.)****[124]***Enhanced Archaeological Subsurface Testing for Cultural Resource Management: Innovation in the Field***[WITHDRAWN]**

Comeau, Brad [21] see Brady, Ryan

Comer, Anne [192] see Dunning Thierstein, Cynthia

**Conard, Nicholas****[56]***Discussant***Conard, Nicholas and Manuel Will (University of Tübingen, Germany)****[212]***What Drives the Variability in MSA Lithic Assemblages from Sibhudu Cave, South Africa*

After over a decade of excavation and analysis at the Middle Stone Age site of Sibhudu in KwaZulu-Natal, South Africa, the team from the University of Tübingen has established a uniquely complete and well-

documented record of cultural change from the end of the Middle Pleistocene until ca. 50 ka BP. In the context of a symposium in honor of Harald Dibble, this paper will examine the record of change in lithic technology and typology over this long and well-stratified stratigraphic sequence. The paper will highlight competing concepts for characterizing and organizing the lithic record at Sibhudu. Additionally, the presentation will consider potential causal explanations for this dynamic record including the role of the life history of tools, environmental causality, raw material selection, and social-economic changes that may have dictated shifts in stone knapping and tool use.

Conard, Nicholas [166] see Mentzer, Susan

**Conkey, Margaret (UC-Berkeley)**

[14]

*Discussant*

[119]

*Moderator*

**Conlee, Christina (Texas State University)**

[112]

*Chair*

**Conlee, Christina (Texas State University) and Aldo Noriega**

[112]

*One Hundred Years of Research at Huaca del Loro, Nasca, Peru*

It has been almost 100 years since Julio C. Tello, the father of Peruvian archaeology, and his team first investigated the site of Huaca del Loro in Nasca, Peru. During this time the site has been interpreted as a cemetery, a settlement with both elites and commoners, a possible highland Huarpa site, the largest local town during the Middle Horizon, and a place of resistance against the Wari empire. Excavations in 2019 and 2022 reveal the settlement is multifaceted and includes a Wari colony with imperial-style compounds and a D-shaped temple, a substantial elite cemetery with hybrid Wari and local Nasca burial practices, and a large residential area. The D-shaped temple and the burial of at least four mummy bundles (*fardos*) next to it indicate that ritual, including ancestor worship, was an important aspect of this site. Evidence of the processing of pigments, manufacturing of stone tools, and the growing of large quantities of cotton attest to the economic function of the settlement. Huaca del Loro reflects the complex relationship between the highland Wari and Nasca people, and the dynamics of colonial expansion and local responses.

**Conly, Caitlin (University of Notre Dame) and Mark Schurr (University of Notre Dame)**

[29]

*Life and Adaptation during the Little Ice Age in Midwestern Agricultural Villages: Evidence through Stable Isotopes*

The Middle Grant Creek archaeological site, located in northeastern Illinois, was a prehistoric village occupied in the early seventeenth century, during one of the coldest periods of the Little Ice Age. Despite this, the site was home to up to 200 inhabitants for around a decade and showed signs of impressive maize cultivation and storage to feed the large population. Stable oxygen isotopic analysis of *Actinonaias ligamentina* shells from various levels of storage pits can allow for climate reconstruction during the site's occupation. This climate reconstruction can be enhanced by isotopic analysis of shells from another site in the region, Collier Lodge, which provides shells from the mid-1400s through the twentieth century. Through this analysis, Middle Grant Creek's specific climate can be assessed within the background of a wide span of the Western Great Lakes region. In addition, previous archaeological work at this site can be analyzed in the context of this climatic change to understand how the individuals here lived and adapted to their environment.

**Connell, Samuel (Foothill College), Chad Gifford (Columbia University) and Daniel Cearley (Las Positas College)****[57]***Castle Ballintober, Roscommon, Ireland: Nothing but Tractors and Cows*

Late Medieval colonization of Ireland by the Anglo Normans was characterized by the imposition of English infrastructures upon the Gaelic Irish landscape. Indeed, our work beyond the Pale at Ballintober Castle, County Roscommon, sees a shift from the seasonally pastoral nature of Irish life to a more rigid lifestyle dominated by the structures of “boom-town” villages, massive walled construction projects, and the wheat harvest. But we also see that these people moving into Ireland with their accompanying infrastructures were reverse integrated into an Irish way of life, thereby shifting the colonial narrative from unidirectional acculturation to a negotiated assimilation. Recent research from the Castles in Communities Archaeological Settlement Survey (CIC-ASS) will be covered, as new data emerge from both Ballintober Castle and its adjacent deserted medieval settlement.

**Connolly, Tom (University of Oregon Museum of Natural & Cultural History)****[62]***Discussant***Connolly, Tom (University of Oregon Museum of Natural & Cultural History) and Perry Chocktoot (Klamath Tribes)****[98]***Challenges to Managing Tribal Knowledge and Physical Places within the Homelands of the Confederated Klamath Tribes*

People recognize places on the landscape that have historical and spiritual importance to their communities, and it is often the case that different cultural communities sharing the same space have very different cultural maps. Among Tribal communities, identifying specific places of significance is sometimes shared only reluctantly with the non-Native public. This may include concern with looting of archaeological sites but also with maintaining the integrity of places with historical or spiritual importance where physical traces of human presence may be subtle or imperceptible. This reluctance can provide challenges to land managers who often share responsibility with Tribes to manage and protect important places, but it is driven by greater concerns with attitudes among some of the general public that dismiss the values and traditions of other cultural groups, and the feeling of entitlement that drive disrespectful behaviors on both private and public lands. We explore the challenges regarding the management of both Tribal knowledge and physical places with examples from the homelands of the Confederated Klamath Tribes of south-central Oregon.

**Connor, Kimberley (Stanford University)****[208]***Chair***Connor, Kimberley (Stanford University)****[208]***Culinary Archaeology at Hyde Park Barracks: Multi-material Analysis of Food and Dining in a Nineteenth-Century Immigration Depot*

In history, Barbara Haber has made the distinction between academic food history and culinary history grounded in knowledge of recipes and cooking techniques. This paper uses the case study of the Female Immigration Depot (1848–1887) in Sydney, Australia, to consider what a culinary archaeology would look like. The site, at Sydney’s Hyde Park Barracks, features desiccated underfloor occupation deposits beneath the floors throughout the building with remarkable preservation of organic artifacts that provides a unique opportunity for multi-material analysis of animal bone and macrobotanical remains in addition to glass, ceramics, and metal. Tacking between archival documents and archaeological material, how does re-centering the kitchen and the table shift the interpretation of food and dining practices for newly arrived female immigrants?

**Conrad, Cyler (Los Alamos National Laboratory), Jonathan Dombrosky (Crow Canyon Archaeological Center), Abigail Judkins (University of New Mexico), Jacqueline Kocer (University of New Mexico) and Emily Lena Jones (University of New Mexico)**

[48]

*Hydrogen and Oxygen ( $\delta^2\text{H}$  and  $\delta^{18}\text{O}$ ) Isotopes and the Study of Human-Turkey Relationships in the Northern US Southwest*

Previous studies have established consistency, but also substantial anomalies, in how turkeys (*Meleagris gallopavo*) were managed across the US Southwest/Mexican Northwest. In this paper, we present bone collagen derived stable hydrogen ( $\delta^2\text{H}$ ) and bone apatite derived stable oxygen ( $\delta^{18}\text{O}$ ) isotopes in turkeys from Tijeras Pueblo (LA 581), Chamisal Pueblo (LA 22765), Arroyo Hondo Pueblo (LA 12), and the Gallina-affiliated sites of Rattlesnake Ridge (LA 35648) and Cuchillo (LA 22861). These isotope systems, although rarely discussed when investigating human-turkey relationships within the US Southwest/Mexican Northwest, present the opportunity to identify patterns relating to turkey foraging and management, as well as human mobility, when analyzed in conjunction with carbon ( $\delta^{13}\text{C}$ ) and nitrogen ( $\delta^{15}\text{N}$ ) systems.

Conrad, Grace [105] see Cook, Robert

Conrad, Grace [219] see Eren, Metin

Cont, Daniel [63] see Vining, Benjamin

**Conti, Alberto, Tessa Amend, Jake Fruhlinger and Erick Robinson**

[88]

*Leveraging Longitudinal Data for Lithic Technological Organization Research*

Lithic technological organization research depends on multiscale perspectives connecting macroscales of land use and raw material economics to microscales of individual sites. Surface sites comprise a major source of data in many lithic technological organization studies. These sites are often recorded one time and rarely monitored. This can lead to biases in the data for technological organization. Biases are caused by both human factors such as the experience of survey crew members, to natural factors caused by sedimentary dynamics. For these reasons, longitudinal data from actively monitored management contexts can minimize the role of bias in the interpretation of lithic data at landscape scales. This presentation focuses on data from the playa landscapes of the Orchard Combat Training Center in Boise, ID, which has been actively monitored since 1987. This work provides a method for leveraging longitudinal management data to enhance research on lithic technological organization in dryland landscapes of the American West.

**Contreras, Daniel (University of Florida) and Brian Coddig (University of Utah)**

[97]

*Density Dependent Models Rely on Accurate Population Estimates*

Archaeologists increasingly leverage ideal distribution models to analyze settlement and demographic patterning in the past. Successful application requires adequate, spatially explicit proxies of both environmental suitability and past population. This paper focuses on the latter, recognizing that a growing number of studies rely on summaries of assemblages of radiocarbon dates as proxies for past population. However, this “dates as data” approach has known—though often ignored—sources of bias that may impact interpretations of settlement behavior, leading to spurious conclusions. Here we examine the impact of landscape taphonomic bias on the interpretation of past settlement and population density within an ideal distribution framework through a case study of the Bonneville Basin of western North America. The results (a) suggest the scale of potential effects of incautious use of dates as data and (b) provide some clear ways to improve demographic estimates and provide more reliable analyses of past behavior in its ecological context.

**Cook, Duncan (Australian Catholic University)**

[17]

*Discussant*

[17]

*Chair***Cook, Duncan (Australian Catholic University), Larissa Schneider (Australian National University), Timothy Beach (University of Texas, Austin), Sheryl Luzzadder-Beach (University of Texas, Austin) and Nicholas Dunning (University of Cincinnati)**

[17]

*Environmental Legacy of Precolumbian Maya Mercury: Using the Present to Understand the Past*

The Mexico and Central American region has a history of mercury use that began at least two millennia before European colonization in the sixteenth century. Archaeologists have reported deposits of cinnabar (HgS) and other mercury materials at Classic period (ca. 250–900 CE) Maya settlements across the region; however, there has been little consideration of the environmental legacy of this long history of anthropogenic mercury use. This paper presents a new analysis of the archaeology and environmental legacy of mercury use by the precolumbian Maya. We combine all previous archaeological and geochemical data on mercury from the Maya lowlands with new total Hg determinations on archived soil and sediment samples from Maya archaeological projects undertaken since the 1980s. Most Maya settlements in this study have at least one context where total mercury concentrations equal or exceed modern benchmarks for environmental toxicity. We demonstrate how pairing legacy mercury data with archaeological records from Maya sites advances our understanding of how, where, and when the Maya used mercury.

Cook, Duncan [17] see Luzzadder-Beach, Sheryl

**Cook, Jacqueline**

[32]

*Discussant***Cook, Robert (Ohio State University), Grace Conrad (Ohio State University) and Joseph Chambers (Chambers XR)**

[105]

*A Serious Game: Teaching Key Archaeological Lessons with Augmented and Virtual Reality*

While archaeologists are quite good at communicating to each other through various professional outlets, we have not been particularly good at conveying our core findings and lessons for wider audiences. This seems particularly true in the Midwest United States. While there are likely many reasons for this, a key one seems to be the low visibility of the remains of ancient sites in the region in contrast to places like the US Southwest. Here we attempt to remedy this problem by presenting a project that is using immersive digital methods to explore the remains of a low visibility archaeological site in Ohio. Our approach uses Augmented Reality (AR) and Virtual Reality (VR) to accomplish several things. Foremost, these tools have been very successful for increasing visibility of what the site contains and does so in a way as to not further damage the resource. However, we are also utilizing this technology to facilitate remote access to the site and to help the public understand what we have found through excavation, where archaeological photos are used along with three-dimensional objects that can be examined in the context in which they were discovered.

Cook, Robert [132] see Hinkelman, Sarah

**Cook Hale, Jessica (University of Georgia, Full Fathom Five LLC) and Nathan Hale (Flinders University)**

[197]

*Articulating the Big Bend of Florida*

Working from the known to the unknown is a core concept in archaeological prospection and is particularly important in submerged landscapes studies. These landscapes are harder to access and have experienced, potentially, more dramatic changes since they were last occupied. We share here the results of a study in Apalachee Bay, Florida, to identify offshore sites that were contemporary to onshore shell midden sites along with assessments of offshore shell midden site preservation.

Cooke, Richard [223] see Sharpe, Ashley

**Cool, Autumn (Bat Conservation International)**  
[155]

*The Necessity of Subterranean Investigations for Significance Evaluations of Abandoned Mines*

Cultural resource inventories of abandoned mine lands have traditionally been limited to surface-level surveys and archival research. This is sensible given the hazards inherent in subterranean exploration, the general lack of relevant safety training among archaeologists and historians conducting the inventories, and the practical, risk-averse attitudes of employers, contractors, and land management agencies. Therefore, most cultural resource inventories rely on identifying the remains of surface plants, waste rock dumps, and transportation networks. Researchers then extrapolate from these data—occasionally supported by historical documents—the size, complexity, longevity, economic impact, and overall historic significance of the mines. However, the historical focus of labor and the fundamental components of any mine were, naturally, the subterranean mining efforts. Furthermore, surface-based inventory methods are dependent on the flawed assumption that there is a one-to-one relationship between the surface expression of an abandoned mine and its subterranean character. Thus, surface-only inventories risk producing erroneous historical significance assessments based on incomplete data, which in turn lead to inappropriate site treatment and management recommendations. This may result in the destruction of important cultural heritage sites and potential knowledge sources about the lived experiences of miners.

Cooley, Delaney [136] see Pitblado, Bonnie

**Coon, Anna (Association for Washington Archaeology) and Julia Furlong (Arizona State University)**  
[132]

*The Washington Archaeology Mentorship Program: Community Tools for Addressing Systemic Inequalities*

The field of archaeology, and especially the cultural resource management (CRM) industry, faces ongoing systemic inequalities in access to training and employment. The gaps between demand, recruitment, and retention of archaeologists continue to widen annually. One way that this problem manifests is through a lack of networking opportunities and appropriate mentorship for students within the discipline. Archaeology students are often not aware of the career opportunities available to them, or are unsure how to achieve their career goals and aspirations. In an effort to address these issues, the Association for Washington Archaeology has developed a Mentorship Program. To date, the program has assisted dozens of students and emerging professionals by connecting them with established archaeologists impacting archaeology throughout the Pacific Northwest. The program also offers structured meetings, workshops, and unique opportunities to become more involved in archaeological programs throughout the region. This presentation discusses the goals, logistics, and challenges of managing a virtual mentorship program, as well as answering questions for those interested in applying the Washington model to their own state.

Coon, Anna [105] see Cipolla, Lisa

Coon, Anna [105] see Krupa, Krystiana

Coon, Sarah [137] see Keevil, Trevor

**Cooper, Aspen (University of Minnesota, Twin Cities), Gilliane Monnier (University of Minnesota), Goran Pajovic (National Museum of Montenegro) and Gilbert Tostevin (University of Minnesota)**

**[240]**

*Micromorphological Investigations of Site Formation History between Layers XVII and XVIII at Middle Paleolithic Rockshelter Crvena Stijena, Montenegro*

Rockshelters are subject to many geological processes driven by natural and human agents alike. The sedimentary context that surrounds artifactual data is a vital resource to the scientific exploration of human behavior in the Middle Paleolithic. To connect assemblages and help other specialists understand preservation potential and movement of artifacts throughout the site, geoarchaeological tools, such as soil micromorphology, provide a powerful resource for interpreting stratigraphy on a microscopic level and providing context that informs excavation and data collection strategies. The current investigation at Crvena Stijena rockshelter in Montenegro focuses on points of contact between the relatively less anthropogenic Layer XVII and the artifact-rich Layer XVIII, which exhibits many signatures of fire with the presence of abundant charcoal and charred bone constituents. Four micromorphology blocks were collected during the 2021 field season to assist in understanding site formation history as the field team approaches deposits of archaeological importance and documents “excavation surfaces” using photogrammetry. Facies observed in petrographic thin section were used to characterize several depositional and erosional episodes that have altered areas in which Neanderthals were active throughout the life history of the rockshelter.

**Cooper, H. Kory (Purdue University), Matthew Pike (Stantec) and Garrett Hunt**

**[219]**

*Precontact Native Copper Innovation in the North American Arctic, Subarctic, and Northwest Coast*

Precontact Indigenous copper technological practices within the North American Northwest vary along regional, cultural, and temporal axes. After being screened for smelted metals and alloys using pXRF compositional data, we identified multiple significant patterns of technological specialization, innovation, and adaptation along all axes of variation, coinciding with the movements and interactions of different regional groups and societies as well as global climatic and colonial pressures.

**Cooper, Jason (WSDOT)**

**[143]**

*State Agency Public Outreach in the Age of COVID*

Information dissemination in cultural resources during the Age of COVID has been facilitated by the rapid growth of online meetings and conferences. In-person-only conferences are going the way of the dinosaur and hybrid forms of meetings/conferences are the future, and the future is now. A hybrid meeting format that includes both in-person and online viewing opportunities is imperative for bringing as many people to the conversation and in the most equitable way possible. Organizations that insist on in-person-only meetings/conferences will continue to minimize their viewership and limit the reach of their message. The Washington State Department of Transportation (WSDOT) is an industry leader in its social media messaging in getting vital information to the traveling public in a timely manner. WSDOT’s public outreach with regard to their Fish Passage Program includes stakeholder meetings online and in the field to facilitate adaptive solutions that are designed to fix fish barriers located under the state’s interstates and highways.

**Cooper, Zachary (University of Colorado, Boulder) and Scott Ortman (University of Colorado, Boulder)**

**[184]**

*Artifact Density and Population Density in Bronze Age China*

A common method of estimating population is to multiply a settlement area by an occupational density. Empirical studies show that occupational density generally increases with settlement size but estimating occupational density when structural remains are not observable has remained a methodological challenge. Here, we suggest that occupational density is systematically related to the surface artifact density of archaeological sites. We employ settlement scaling theory to derive the expected relationship between artifact density and population density. Then, we analyze data from the Chifeng Region of northern China to show that pottery consumption rates, reflected in measured densities of potsherds, do in fact increase with settlement areas in a way that is consistent with this expectation, leading to improved accuracy and precision in demographic reconstructions.

**Cootsona, Melanie (University of California, Berkeley)**

[71]

*Mapping Bison: Oral Traditions from Picuris Pueblo, NM, on Bison Procurement*

This poster explores resilience and survivance of important animal-human economic, spiritual, and cultural traditions through the geospatial lens by mapping and describing ethnographic and archaeological interactions with *Bison bison* and Picuris Pueblo in the long term. In the Puebloan world, bison-human interactions are constrained by geographic and later colonial pressures in the Southwest. However, on the borderlands of northern New Mexico, Picuris Pueblo over the last 800 years has continued to assert their ties to bison through trading, hunting, and now bison herd management. Visualizing the extent of Picuris and northern Tiwa interactions with the environment and important species such as *Bison* is crucial to arguing for the large-scale, long-term occupation of Picuris within the northern Rio Grande and the western Plains. This research therefore contributes to the Pueblo's land rights and water rights litigation.

**Coppola, Anna (Northern Arizona University), Magen Hodapp (Northern Arizona University), Brooke Priest (Northern Arizona University) and Chrissina Burke (Northern Arizona University)**

[122]

*A Preliminary Zooarchaeological Analysis of the Houck Sites in Northeastern Arizona*

American Southwest zooarchaeological analyses have established that ancestral communities employed or interacted with a wide-range of species, with dietary focus on rabbits and deer. Working with Museum of Northern Arizona curated collections of previously excavated faunal assemblages from the Houck sites, this poster presents the preliminary data collection and analysis of identified taxon or size class, element, age/sex, as well as taphonomic agents and effects. Our analyses demonstrate the similarities in animal use with other northern Southwest sites. For that reason we also report the Lagomorph and Artiodactyl indices for comparison with other Northern Arizona sites analyzed. Finally, we discuss other animals, such as turkeys, dogs, macaws, and some novelties, such as bison to holistically explain our preliminary findings.

Coppola, Anna [71] see Priest, Brooke

**Cordova, Carlos, Guillermo Acosta-Ochoa (Instituto de Investigaciones Antropológicas), Luis Morett-Alatorre (Universidad Autónoma de Chapingo), Kurt Wogau (Instituto de Investigaciones Antropológicas) and Tamara Cruz y Cruz (Escuela Nacional de Antropología e Historia)**

[54]

*Exploring Long-Term Environmental Dynamics and Human Transformation of Aquatic Spaces in Lake Texcoco, Mexico*  
Lake Texcoco was the largest of the five lakes that existed in the Basin of Mexico. Drained almost completely in the early 1900s, most of its western part has been occupied by Mexico City's metropolitan area, though its eastern part remains undeveloped, which permits exploring the prehistory of the lake. In addition to several Pleistocene sites with extinct megafauna, Holocene preceramic sites, and numerous *tlatel*-type settlements and hydraulic infrastructure of the agricultural period. Additionally, sequences of fluvial, fluvio-lacustrine (deltaic), lacustrine, lakeshore, and palustrine sediments provide information to reconstruct lake level

fluctuations and the adaptation of human populations to extreme changes in the lacustrine environment. Our team has initiated survey and excavation of test pits in key areas, as well as mapping former deltaic features, springs, as well as lacustrine settlements and features associated with prehispanic hydraulic control of the lake. The application of photogrammetry and lidar to map former canals, dikes, and raised fields, and the chronological sequence of mapped features and sediments show that the evolution of management of saline and freshwater for intensive occupation described in the lake at the time of the Spanish conquest had a long history concomitant with sizable lake fluctuations.

**Corl, Kristin (University of Texas, San Antonio)**

[199]

*Zooarchaeological Evidence of Human Niche Construction at the Harris Site (LA 1867)*

The Harris Site (LA 1867) is a Late Pithouse period (AD 550–1000) agricultural village located along the upper Mimbres River Valley in New Mexico. This period is seen as a time of great demographic and social change linked to changes in the environment. This site provides an excellent case study looking at increased dependence on agriculture and the animal communities associated with this type of subsistence strategy. To what degree did the modified environment associated with increased agricultural dependence effect the animals people relied on for food? A wide variety of animals were represented in the assemblage that reflect the natural biodiversity found in the surrounding region suggesting a variety of cultural and subsistence behaviors. However, zooarchaeological data and relative taxonomic abundance revealed three targeted taxonomic groups: rabbits, deer, and rodents. Ethnographic evidence shows that populations of these taxonomic groups increase with the expansion of cultivated fields and other human disturbed environments. Together with the wide variety of birds and wetland related species this data helps to paint a more complete picture of the ways in which the surrounding environment of the Harris Village niche was constructed, maintained, and changed through the occupation of the site.

**Corona, Néstor (Centro de Estudios de Geografía Humana), Mario Retiz-García (Centro de Estudios Arqueológicos), Hans Roskamp (Centro de Estudios de las Tradiciones) and Blanca Maldonado (Centro de Estudios Arqueológicos)**

[13]

*Damage on the Jicalán Viejo Complex by Land Use from 1970 to 2021: A Modern Mapping Assessment*

In 2003, a field survey at the site of Jicalán Viejo was carried out, inspired by ethnohistorical interpretations of the Lienzo of Jicalán, also known as Lienzo de Jucutacato. One of this site's most outstanding characteristics was the evidence of copper smelting, including slag deposits discarded as waste piles, remains of a ceremonial mound, and diverse lithic tools scattered on the surface. In terms of architectural structures, a colonial habitational site with well-preserved architectural remains was located. However, almost 20 years after that fieldwork, the site looks quite different, with discrete, barely visible wall foundations, fragments of copper slag dispersed by agricultural activities, and devastated remains of habitational structures. In 2021 a UAV photogrammetry survey calibrated with an RTK system was conducted. The processed results (a 3D point cloud, high-resolution models) were combined with the 2003 fieldwork data, a 1969 aerial photograph, and Google earth multitemporal satellite images. Detailed cartographical data have allowed us to reconstruct the 2003 scenery despite the systematic damage and draw a complete picture of ancient Jicalán's landscape.

**Corr, Molly**

[103]

*The Household Ecology: Investigating the Household Response to Food Insecurity among the Lacandon Maya*

Starvation and malnutrition have ravaged societies for thousands of years, but the effort to leverage food insecurity has existed just as long. When faced with hunger, humans adapt and respond to the best of their abilities, which may look different according to the resources and options available to them at the time. Maya subsistence literature has a long history of examining the management of food insecurity from a top-down perspective, often overlooking improvisational abilities at the household level. The household is the nexus where families confront their opportunities and make choices to survive (ReCruz 1996). It is an effective

method to study the symptoms and management of food insecurity under socioeconomic and environmental change. Drawing on ethnographic studies among the Lacandon Maya in Chiapas, Mexico, I investigate how households respond to food insecurity by examining household ecology, or “the study of the relations of appropriation and management of resources” (Wilk 1977:204). I argue that Lacandon households are highly adaptive and dynamic structures, especially during times of food insecurity, heavily relying on foraging strategies and the flexible roles of women and children. Ultimately, the lessons learned from the Lacandon can contribute to discussions of starvation management, both past and present.

Corrales-Ulloa, Francisco [213] see Suárez Calderón, Amanda

**Correa, Jacqueline, Ester Echenique (Universidad de Tarapacá) and Calogero Santoro (Universidad de Tarapacá)**

[206]

*Inka Unku: Imperial or Provincial? State-Local Relations*

Standardized Inka tunics or unku were created under the Inka State auspices as symbolic expressions of their expansionist power. To ensure these textiles acquired the status of effective insignias of territorial control, the Inka imposed technical and aesthetic canons on highly skilled weavers. These conventions were adapted relative to the traditions and experiential knowledge of provincial social groups that came under imperial rule. We therefore, propose that this was not a one-way process in the provinces. By contrast, the unku were created by expert local weaving agents, who incorporated their own meaningful symbolic elements. We developed a theoretical-methodological tool to analyze the unku, by defining a series of standard analytical patterns and attributes based on technological, structural, and aesthetic aspects. In this paper, we present the analysis of one systematically excavated unku from Caleta Vitor, northern Chile. The methodological tool enabled us to determine the step in the operational chain at which local technical and aesthetic elements were incorporated, thus affecting the emblematic imperial imagery associated with these tunics. The results contribute to the understanding of a syncretic landscape that combines the State worldview with craft-production practices that were rooted in local communities

**Correa, Leticia (University of São Paulo) and Astolfo Araujo (University of São Paulo)**

[21]

*When Technological Analysis Becomes a Setback: The Case of the Points in the Interior of São Paulo State, Brazil*

Historically, the shift from the study of form to the study of techniques was guided by the transition from the Cultural History approach to the New Archaeology. This theoretical readjustment was incorporated into Brazilian Archaeology decades later, strongly impacting the way that the collections were studied. Today the reality is that, although lithic studies have advanced considerably in methodological terms, in Brazil there is still a great reluctance to understand form as a complementary attribute for technological analysis.

Considering as a case studies collections composed of points, located in five different watersheds, this presentation aims to show how the technological approach, applied in isolation, may not be able to delimit the variability of assemblages when they are compared regionally.

Cortés Meléndez, Víctor [133] see Takatsuchi, Ryohei

**Cortes-Rincon, Marisol (Cal Poly, Humboldt), Kristen Harrison (Cal Poly, Humboldt), Amanda Zetz (Cal Poly, Humboldt), Raylene Borrego (Cal Poly, Humboldt) and Hannah Vizcarra (Cal Poly, Humboldt)**

[17]

*A GIS and Remote Sensing Approach to Settlement Patterns, Cultural Landscape, and Utilization of Natural Resources in the Hinterlands: Dos Hombres to Gran Cacao Archaeology Project*

Besides using lidar data, the application of various methods (e.g., documentation by total station, aerial photographs, modern/historical maps, and archaeological data) helps to assure a more precise identification

and interpretation process of the archaeological features. In addition, the geographical information system (GIS) offers a great solution for managing together all these various types of information. In this paper, the application of lidar analysis in the GIS environment will be discussed. The results of this research will contribute to the growing international dialogue regarding the use of lidar for archaeological studies by providing examples of features that have been discovered in this region, how they can be interpreted, and how these interpretations can contribute to theoretical anthropological perspectives regarding how the ancient Maya utilized and managed their landscape. Some of the results from the sites surveyed by lidar and field surveys are presented in this paper including the discovery of new sites and the detection of new structures at known sites. By layering diverse datasets in GIS—derived from remote sensing, field surveys, artifactual data, paleobotanical analyses, and other methods—the project is generating a wealth of information pertaining to this area and its relationship to the local and regional economy.

Cortes-Rincon, Marisol [227] see Angeloff, Nick  
 Cortes-Rincon, Marisol [77] see Borrego, Raylene  
 Cortes-Rincon, Marisol [183] see Rutherford, Cady  
 Cortes-Rincon, Marisol [55] see Vizcarra, Hannah  
 Cortes-Rincon, Marisol [95] see Zetz, Amanda

**Cory, Mackenzie (Indiana University)**  
**[190]**

*Paracosmic Play Areas in Western Plains Boarding and Day Schools*

Childhood play areas represent a complete departure from the landscapes that archaeologists often examine in that they exist within adults' domestic, logistic, and/or sacred spaces yet simultaneously outside of any of these spatial ideals. The difficulty in analyzing these areas is further compounded when Indigenous ontologies are considered, especially those of children who may or may not fully engage with larger cultural systems, and even more so when considering the intersection of children's' understandings of the intersection between their belief and colonial policies. In this paper I briefly present the methodology that I use to identify where children played in boarding and day schools in the western Plains, based on evidence in the historic and archaeological records, and discuss the micro-paracosmic nature of these play areas drawing from traditional Native understandings of childhood. Finally, I take a closer look at the phenomenological "reality" of these spaces and argue that, at least when occupied by playing children, these areas require an expanded understanding of contemporary archaeological approaches, an understanding that draws from the lens of the children themselves.

Corzo, Lilian [11] see Reyes, Mara

**Coskunsu, Güner, Maria Rosa Iovino (Centro Internazionale di Sperimentazione) and Arzu Karahan (Institute of Marine Sciences, Middle East Technical University)**  
**[232]**

*Contributions of Experimental Archaeology and Use-Wear Analysis to the Study of Limpets (Patella sp.)*

Shells have great potentials to inform about the past both from cultural and environmental perspectives. However, despite their importance for ancient people and vast occurrence in prehistoric archaeological sites, Pleistocene shells have gotten less attention. Limpets (*Patella* sp.) rarely occur in Mediterranean Pleistocene and Holocene assemblages, leaving us with unanswered questions about their exploitation by humans for different purposes, such as diet, tool and ornament production, and symbolic meaning. Limpets are typical marine mollusks present in intertidal environments. Based on archaeological data from shell midden sites in Europe, Africa, and the New World, and though ethnohistory and ethnography, it is well known that limpets have been widely used for dietary purposes since prehistoric hunter-gatherer societies until today in coastal areas. However, we still do not know why limpets were harvested and brought to sites where they appear more rarely, such as the Mediterranean Paleolithic, Epipaleolithic, and Mesolithic sites in Italy and Turkey. We

aim to present some new results from a joint analysis based on experimental and survey research on limpets from Turkish and Italian Mediterranean coasts. Use-wear analysis and ethnographic accounts are also utilized in order to contribute a better understanding and interpretation of limpets in archaeological contexts.

**Cossin, Zev**

[57]

*Chair*

**Cossin, Zev**

[57]

*Unsettling Infrastructures that Settle: From the Andean Hacienda to a Minnesota Railway*

Through European colonization, plantations and haciendas became infrastructures that “settled.” These colonial infrastructures transformed social and ecological relations throughout the Americas as they displaced Indigenous peoples from the land. Later, other forms of infrastructure like railroads further “settled” frontier areas of new and growing nation-states. These forms of infrastructure accelerated settler colonialism while also accelerating access to commodities and new, single-use consumer goods, and industrial export agriculture. This paper travels between the Ecuadorian Andes and the Minnesota prairie to explore parallel, yet distinct, processes of infrastructures that settled and the ways in which people and other-than-human ecologies have, and continue to, unsettle those infrastructures.

Cottle Peacock, Clelie [234] see Wyatt, Andrew

Couch, Garet [136] see Nolan, Kevin

**Coughlan, Michael (University of Oregon), Kelly Derr (University of Oregon), James Johnston (Oregon State University), David Lewis (Oregon State University) and Bart Johnson (University of Oregon)**

[62]

*Precontact Indigenous Fire Stewardship: From the Valley to the Forest*

Indigenous peoples lived in the Willamette Valley and adjacent highly productive upland forests for millennia and successfully coexisted with the region’s fire regimes. Like today, wildfires posed a threat to past societies and their livelihoods. Precontact Indigenous peoples of the Willamette Valley region would have been keenly aware of how fire relates to climate cycles, local landscapes, and weather conditions through personal observations and multigenerational traditional ecological knowledge. It is generally accepted that precontact Indigenous peoples used fire (fire stewardship) to intensively manage resources in the lower elevation prairies and savannas of the valley. We present preliminary results of an interdisciplinary study combining fire history, ethnohistory, and archaeology in the western Cascades to support the hypothesis that Indigenous stewardship also included the application of fire to some upland forest landscapes. We further explore how fire stewardship could have buffered Indigenous communities from severe wildfire events while attenuating longer-term effects of climate variability on forest composition, structure, and focal subsistence resources. Contrary to deterministic narratives, we suggest that Indigenous stewardship not only increased the abundance of key resources, but decreased risks of their loss to wildfire. Developing our understanding of Indigenous stewardship may offer solutions for modern fire management.

Coughlin, Sean [126] see Silverstein, Jay

Covarrubias, Gabriela [135] see Flores-Fernandez, Carola

**Coverdale, Julia (Kansas State University; Crow Canyon Archaeological Center)****[27]**

*What's the Deal with Corrugated Whitewares? An Analysis of the Corrugated Whitewares from the Haynie Site*  
Corrugated exterior whitewares in the Ancestral Puebloan world are often thought of as a rarity. While these ceramics are not as common as gray ware corrugated or regular black-on-white ceramics, they are an important blending of pottery manufacture. Corrugated whiteware ceramics can also help us begin to understand symbolism and meaning of corrugation itself. In this poster, I will discuss my analysis of the corrugated whiteware sherds that have been thus far discovered at the Haynie site. The Haynie site is a multicomponent site with occupancy ranges from the Basketmaker III period to the Pueblo II period, specifically focusing on the ceramic manufacture from the Pueblo II Great House component. Through this analysis and previous Great House site data from the region, I hypothesize that corrugated whitewares are associated with the Chaco Phenomenon.

**Covert, Alexandra (Flagstaff Area National Monuments)****[121]**

*The Effects of Water Erosion on Archaeological Sites at Wupatki National Monument*

The effects of environmental changes can be seen through changes in archaeological site conditions. Over the past four years, archaeological sites at Wupatki National Monument have been significantly affected by water erosion. Water erosion, mainly from summer monsoons, is affecting the integrity and condition of these archaeological sites. The identification of archaeological sites being affected by water erosion can constitute a need for National Park Service archaeologists to implement preventative measures and develop risk mitigation strategies to protect and preserve these archaeological sites. WUPA01109, an archaeological site consisting of a multi-room structure and four cists, is a prime example of how water erosion can affect an archaeological site over time. Over the past 11 years, water has significantly eroded this archaeological site causing new features and artifacts to be exposed as well as previously recorded features to be covered by shifting cinders. Mitigation measures were implemented in order to preserve and protect this archaeological site.

Cowan, Jason [37] see Hulse, Eva

**Cowie, Sarah (University of Nevada, Reno)****[144]**

*Moderator*

**Cowie, Sarah (University of Nevada, Reno)****[166]**

*Encouraging Social Theory, Diversity, and All That Jazz*

Although perhaps best known for his research and mentorship in archaeological science and African archaeology, David Killick has also mentored students who do more humanistic research and broadly encouraged diversity in the sciences, with far-reaching effects. For decades, his support of women and international students has had real consequences for us. Now we find ourselves readily paying it forward in academic and research climates that are increasingly encouraging diversity too. Likewise, his students whose work intersected with science, technology, and society studies learned (and now teach their students) that social theories are not plug-and-play tools in a box, but rather something to explore creatively and improvisationally in research and writing practices. This paper combines reflections on lessons learned from his mentorship with applications to my work in the archaeology of the American West, heritage ecologies, collaborative and Indigenous archaeologies, and mentoring diverse students in the academy.

Cox, Eric [201] see Forest, Marion

Cox, J. Royce [239] see Jones, Shelby

**Crabtree, Pam (New York University)**

[76]

*Continuities in Urban Provisioning in Early Medieval Ipswich*

Intensive archaeological research was carried out in Ipswich between 1975 and 1990 in advance of urban redevelopment and new construction. The mammal and bird bones from 16 sites dating between 700 and 1150 were analyzed in order to identify patterns of urban provisioning and possible changes through time. The early medieval period was a period of substantial political and cultural changes during the early medieval period. Between 800 and 920 CE Ipswich came under Danish Viking control. While Ipswich was once again under Anglo-Saxon control after 920, it suffered after the Norman Conquest, and many of the urban plots lay in waste in the later eleventh century. Despite these changes, zooarchaeological research indicates long-term continuities in both overall species ratios and animal mortality profiles. These data suggest that the patterns of urban provisioning exhibited resilience in the face of substantial political and military changes.

Craig, Nathan [143] see Arakawa, Fumi

**Cramb, Justin (University of Alaska, Fairbanks) and Carla Hadden (Center for Applied Isotope Studies)**

[245]

*Of Islands and Dogs: Ethnohistoric and Isotopic Pathways toward Understanding Past Dog Diet in Tropical Oceania*

Ethnohistoric accounts suggest people treated dogs differently across Oceania at the time of European contact. European accounts often state that the dogs of Oceania were fed plant foods such as breadfruit, coconut, yams, and taro. Some sources also reference dogs eating fish or taking on the roles of scavengers and hunters. Collectively these accounts suggest that dogs' diets varied across the Pacific. As dogs are omnivorous and can survive on a range of diets, it is likely that the local ecological, geological, and cultural setting influenced dogs' diets on different islands and in different island groups. Here we present  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  values preserved in archaeological dog remains from differing island types (volcanic, coral, and mixed) to estimate the proportion of the animals' diets derived from marine sources, along with the trophic level of consumed animals. Our findings suggest that, while outliers exist, the majority of dogs from a given island share similar isotopic signatures. These signatures, however, differ between island types. This indicates that island type may be a general predictor for dog diet.

**Crandall, James (CSU, Sacramento) and Timothy Galowicz**

[28]

*An Overview of Painted Rock Representation in the Utcubamba Basin, Eastern Peru*

This poster summarizes several years of investigations into painted rock representation and its social context within the Utcubamba Basin, Amazonas, Eastern Peru. This poster has three aims. The first, to provide an overview of the Utcubamba basin's forms of painted rock representation. This is significant to a broader history of the region as there are few extant precolumbian forms of visual expression. While representational designs on ceramics, carved stone, and decorated textiles were produced, they are comparatively rare. Therefore, painted rock expressions serve as the largest corpus of extant visual self-representation for the region. The second aim is to provide visual documentation of 18 previously unpublished sites from tributaries of the Upper, Central, and Lower Utcubamba River. Finally, we explore the relationships of painted rock representation to socially significant spaces. Cultures of the Utcubamba Basin constructed and built complexes for their dead, and these spaces held a high social and cosmological significance. Included in these sacralizing practices was the topographic painting of rock surfaces as a part of their construction and a continued ritualized engagement with ancestors.

Craner, Beau [8] see Dudgeon, John

**Crass, Barbara (Museum of the North, University of Alaska, Fairbanks), Charles Holmes (University of Alaska, Fairbanks), Joshua Reuther (Museum of the North, University of Alaska, Fairbanks), Gerad Smith (University of Alaska, Fairbanks) and François Lanoë (University of Arizona, Tucson)**

[15]

*The Carpenter Quarry Site: A Unique Salvage Excavation Strategy*

The Carpenter Quarry site is an early multicomponent site discovered in the interior of Alaska in 2021. The site overlooks the Tanana River and Shaw Creek Flats, an area rich in significant sites, including Broken Mammoth, Mead, Holzman, and Swan Point. The site, located on top of a bluff with the Middle Tanana Dene place name Naayaa'ee' ("he looks across") (Mishler 1986:121), was the overburden on an active rock quarry. A test unit provided artifacts and fauna associated with a ca. 10,500 cal BP hearth feature. Once the potential importance of the site was discovered, the owner generously allowed our crew six weeks to excavate in early summer 2022 before most of the remaining site would be destroyed. As expected, much of the site was unexcavated at the end of six weeks. With the help of the landowner and his heavy equipment, the remaining sediment was moved off site in blocks by culture levels for later archaeological recovery. This salvage excavation method may be useful in other archaeological contexts.

Crass, Barbara [15] see Wygal, Brian

**Crawford, Dawn (Southern Methodist University)**

[82]

*Crafting in a Non-elite Maya Household at Holtun, Guatemala*

The site of Holtun, in the central lakes region of the Maya lowlands, was occupied from the Preclassic through the Postclassic. Over 30 residential groups make up the northern settlement area on the periphery of Holtun where most of these surface residential structures date to the Late Classic and Terminal Classic periods. The non-elite household designated as Group N33 is located within this northern settlement and consists of a patio group and agricultural terracing to the south and west. A much larger quantity of formal chert tools and debitage were recovered within this group when compared to other households sampled across Holtun. Additionally, a test unit located to the southwest directly outside of the patio group uncovered large concentrations of chert blades and debitage within clay-like matrixes extending down approximately 3 m. This paper discusses Group N33's possible role(s) within this Classic period community, including its position in the production, distribution, and use of chert, as well as obsidian and ceramics. This non-elite household used chert tool production to augment their local socioeconomic status and elevate their position during the Late to Terminal Classic periods.

Crawford, Markus [239] see Hurst, Stance

**Creager, Brooke**

[134]

*Chair*

**Creager, Brooke**

[134]

*A Stable Isotopic Investigation into Diet and Mobility at the Medieval Cemetery at Sutton Road, Milton, Oxfordshire*

A stable isotope investigation of diet and mobility was conducted on individuals excavated from the medieval cemetery of Sutton Road, Milton, Oxfordshire. Fifty individuals were excavated from the cemetery, many of whom exhibited evidence for degenerative diseases and trauma. Skeletal analysis also indicates a significantly

older population than is common in a medieval cemetery. These characteristics indicate that Sutton Road may have been a center for healing, and the stable isotope analysis was conducted to determine whether the population was composed of primarily local or nonlocal individuals. Rib and femur samples from 42 individuals were analyzed for carbon ( $\delta^{13}\text{C}$ ), nitrogen ( $\delta^{15}\text{N}$ ), and sulphur ( $\delta^{34}\text{S}$ ) isotope values to reconstruct adult diet and mobility. Enamel samples were taken from first and/or second molars from seven individuals for oxygen ( $\delta^{18}\text{O}$ ) isotope analysis to reconstruct childhood mobility. Results from two of the seven individuals have oxygen values not compatible with Britain. Overall, isotopic data indicate that over 50% of the burial population settled in Oxfordshire in adulthood. This suggests that the Sutton Road community was likely a center for healing or pilgrimage based on the identification of numerous individuals from outside of Oxfordshire.

**Crema, Enrico (University of Cambridge) and Charles Simmons (University of Cambridge)**  
**[142]**

*A Hierarchical Bayesian Approach for Estimating Gini Coefficients from House Floor Area: A Case Study from Prehistoric Japan*

Robust quantitative measures of wealth inequality are pivotal for investigating long-term social and economic changes from a comparative perspective. Notwithstanding criticisms on its reliability as a proxy of wealth inequality, the application of Gini coefficients on house size data has successfully enabled cross-cultural comparisons that would otherwise have not been possible. Still, robust estimates of these coefficients require relatively large sample sizes, and the uncertainties associated with the estimates themselves are typically ignored in the subsequent level of analyses when multiple sites and geographic areas are compared against each other. Here we introduce a hierarchical Bayesian approach to tackle this methodological challenge, using a log-logistic distribution model (in which the shape parameter is the reciprocal of the Gini coefficient) and taking into account the hierarchical structure of our data. We apply this approach to the household record of the Jomon and Yayoi periods in prehistoric Japan, to determine (1) whether the increasing evidence of social complexity suggested for the latter half of the Jomon period is reflected in house size distribution, and (2) whether the distinct response to the introduction of agriculture in western and eastern Japan has also led to divergent socioeconomic trajectories as inferred from the household data.

Cressler, Alan [241] see Schaefer, Jordan

Crider, Andrea [174] see Johnston, Cheryl

**Crider, Destiny (Luther College), Samuel Nelson (Luther College) and Ian Gonzales (Luther College)**

**[216]**

*Ceramic Production in Epiclassic Central Mexico: Strategies for Assessing Regional Variation with INAA, Paste Recipes, and Stylistic Choices*

Epiclassic Central Mexico (ca. AD 550–850) is characterized by competing city-states in which ceramic distribution aligns with a series of neighboring solar market economies. INAA compositional study provides key evidence for assessing multiscale patterns of production of diagnostic and decorated ceramic wares in the Basin of Mexico and Tula regions. And when combined with stylistic and technological attributes, a more nuanced understanding of potting community practices provides insights into strategies for participation in the production and consumption of shared ceramic suites, notably the Coyotlatelco red-on-buff traditions. In addition, ceramic wares that are locally significant can begin to signal more specific pathways of interaction among individual settlements, such as Xajay tripods and the Epiclassic composite silhouette bowls. This presentation highlights a selection of examples to demonstrate ways in which compositional analysis, stylistic variation, and technological choices are documented within and between Epiclassic ceramic wares in order to signal patterns of significant interpretive value. Datasets are derived from survey and excavation from sites and projects across Central Mexico as part of Crider's ongoing research in the Basin of Mexico and Tula regions.

Cristiani, Emanuela [87] see Gravel-Miguel, Claudine

**Croes, Dale (Washington State University)**

**[246]**

*Household Cordage in the Ancient Ozette Longhouses, a Mudslide-Covered Village on Northwest Coast of North America*

Rarely can you characterize all the cordage and knots in use within an ancient household. At Ozette Village, three centuries ago, a large mudslide flattened, covered, and preserved large cedar plank long-houses. Thousands of cordage and wood/fiber artifacts were preserved and recovered in situ, in use and stored by the ancient extended families of whalers/fishers/gatherers and their slaves. WSU worked in equal partnership with the Makah Indian Nation, and I was the postdoctorate faculty member who undertook the study of thousands of ancient cordage and yarn weaving items. We computer mapped the distribution of these artifacts, revealing their functions throughout the Ozette Plank House I, a house measuring ~40 × 60 feet, 2,400 square feet. These ancient cordage and weaving items reflect the cedar plank house construction (withes holding poles and wall boards), whaling (harpoon lines/harpoon lanyards), fishing (nets/fish lines/leaders), wealth through blankets and bird down blankets (string warps, loom uprights, cross bars, spindle whorls, wool dog remains), sweeping (braided branches), mud/snow shoes (framed hoops), binding elements (cherry bark elements), and several other cordage roles in this ancient maritime community. Cordage and weaving items reflect a unique example of household archaeology and a new line on Northwest Coast ancestry.

Croes, Dale [196] see Carriere, Ed

**Cromartie, Amy and Sebastien Joannin (Institut des Sciences de l'Évolution de Montpellier)**

**[16]**

*Entangled Biodiverse Landscapes: Human and Environmental Dynamics in the Mountain Steppes of Armenia*

In this paper we investigate the entanglement of agro-pastoral and ecological processes on the creation and maintenance of vegetation biodiversity in the mountain steppe of Armenia, an area that has been a steppe for the entire Holocene (Cromartie et al. 2020). Focusing on the Bronze and Iron Age we discuss how biodiversity was co-created by human and nonhuman actors and highlight the importance of this diversity on both social and ecological resilience. We use statistical models based on pollen and macro-charcoal data from an already published sediment core (Cromartie et al. 2020) and combine it with archaeological data from the archaeological project, Project Aragats. We found that humans have not only utilized the diverse resources of this steppe but also shaped this diversity through their agro-pastoral practices, both directly and indirectly, with other ecological actors. We note that increases in biodiversity primarily occur due to increases in wetland and agriculture weeds and suggest these small changes in plant communities were ecologically engineered by these Bronze and Iron Age human groups. [Cromartie, Amy, et al. "The Vegetation, Climate, and Fire History of a Mountain Steppe: A Holocene Reconstruction from the South Caucasus, Shenkani, Armenia." *Quaternary Science Reviews* 246 (2020):106485.]

Cromartie, Amy [56] see Joannin, Sebastien

**Cromwell, Robert (NPS-Fort Vancouver NHS), Christopher DeCorse (Syracuse University) and Douglas Wilson (National Park Service)**

**[6]**

*The Trade Bead Assemblage from the Chinook Middle Village at the Station Camp Site: Western Terminus of the Lewis and Clark Expedition, Pacific County, Washington*

This presentation discusses a trade bead assemblage excavated from the Chinook Middle Village at the Station Camp/McGowan Site (45PC106), a location that can be considered the western terminus of the historic Lewis and Clark expedition of 1803–1806. The camp was situated at the likely site of a seasonally

occupied Chinook village dating to the late eighteenth and nineteenth centuries. The National Park Service undertook data recovery excavations at the site in 2005–2006 ahead of planned development of the site for the commemoration of the bicentennial of the Lewis and Clark Expedition, discovering the remains of at least five Chinook plank houses and their associated artifact assemblages. The bead assemblage, which includes 662 glass beads and 20 copper beads, affords a glimpse of trade materials from the earliest period of Euro-American/Chinook contact. The beads' manufacture, origins, and historical associations are discussed.

**Crosby, Hunter (National Park Service)**

[7]

*The Tree Army in the Desert: Documenting Civilian Conservation Corps Sites in Petrified Forest National Park*

Like many parks and public spaces in the United States, Petrified Forest National Park (PEFO) in northeastern Arizona was built by men who needed to work. From 1934 to 1942 three Civilian Conservation Corps companies constructed infrastructural roads, trails, bridges, overlooks and buildings, assisted with scientific research and fieldwork, and provided education and outreach programs to visitors at the then-Monument. The CCC is responsible for approximately 90% of the infrastructure built within PEFO from 1934 to 1942 and left significant markers of their presence on the landscape—yet prior to 2021, the majority of the CCC-affiliated archaeological sites within PEFO were either recorded not to current acceptable standards, recorded as indeterminate trash scatters, or unrecorded altogether. This paper will summarize the results of the documentation of over 25 CCC-affiliated archaeological sites within PEFO over the past two field seasons, including three company campsites and eight quarrying areas, and offer some possible directives for the future of Arizona New Deal archaeology.

**Crossland, Zoë (Columbia University)**

[60]

*The Signs of the Dead: Theorizing Ancestrality via Semiotics*

In this presentation I explore the ways in which African perspectives on ancestrality can inform archaeological approaches to the past. In historic Madagascar, the works and inheritance of the ancestors were fundamental to the building of political sovereignty, just as they are fundamental to the practice of archaeology and history making. Highland Malagasy recognized that the dead continued to act in the present, their agency made visible through different signs or traces. I explore how this insight directs us to a relational and semiotic approach both toward the presence of the dead and how we perceive their traces archaeologically.

**Crowley-Champoux, Erin (University of Southern Maine) and Zoe Jopp (University of Southern Maine)**

[181]

*Working Together for the Past: Maine's Casco Bay Islands Public Archaeology*

Maine's island communities are the primary stewards of archaeological heritage. This project connects archaeologists, island communities, and natural and cultural heritage organizations in their shared concerns for preserving Maine's shell midden sites, as these sites are particularly vulnerable to the impacts of climate change and development. This project connects current archaeological research to the different stakeholders by developing mobile exhibits and teaching materials with faunal and artifactual collections from the 1960s excavations on Goose Island and Little Chebeague Island as well as presenting information from excavations on the islands through a public archaeology program during the summer of 2022. These materials are used in public presentations with community groups to provide information about archaeological materials as they erode out of the islands' shell middens as well as increasing awareness about what the study of shell middens can tell us about past cultures, environments, and resource distribution in order to aid in monitoring, protection, and preservation of these sites.

Cruz, Arthur [105] see Liwosz, Chester

Cruz, Gabby [44] see Jones, Eric

**Cruz, Pablo (CONICET-UE CISOR UNJu), Valeria Franco (UE IDH, CONICET-Universidad Nacional de Córdoba), Jordi López Lillo (Incipit-CSIC, Spain) and Julián Salazar (CEH Segreti, CONICET-Universidad Nacional de Córdoba)**

[142]

*Social Inequality and Polity Organization in Prehispanic Southern Andean Populations (Argentina and Bolivia, 500 BCE–1500 CE)*

In this communication we will focus on inequality and the forms of social organization in those Andean societies that developed in northwestern Argentina and southern Bolivia during the Formative (500 BCE–600 CE), Regional Development (1200–1450 CE) and Late (1450–1550 CE) periods. Our analysis starts with the use of Gini coefficients obtained from the calculation of surfaces areas of residential units assigned to three prehispanic sociocultural configurations: North Tafí–La Ciénaga in Tucumán (500 BCE–600 CE, 285 households), Tastil and Morohuasi in Salta (1300–1450 CE, 211 households), and the Intersalar Region in the Bolivian altiplano (1200–1550 CE, 549 households). In each case study, the Gini analyses were put in perspective with other material records (granaries, open spaces, crop plots, corrals, burials, etc.), allowing for a better definition of the type of society and its levels of inequality. The results indicate that the social processes that took place in this southern part of the Andes led, unlike those in the central Andes, to the formation of agropastoral societies with low levels of centralization and wealth inequality.

**Cruz, Patrick (University of Colorado)**

[224]

*Settlement Clusters: A Different Way of Conceptualizing Community*

The Velarde Valley of the Northern Rio Grande, New Mexico, has received only limited attention from researchers. The area is known to have been home to several Classic period Tewa communities, some of which were inhabited right up to the time of Juan de Onate's settlement of San Gabriel in AD 1598. The area is also dense with historic and modern settlements which have a long history of irrigation agriculture along the Rio Grande. Based on ethnographic studies of recent Pueblo communities, archaeologists have typically presumed that Classic period settlements represent socially and politically independent communities. However, careful attention to the traditional knowledge manifest in these village sites suggests that they shared a culturally based perspective of the surrounding regional landscape and viewshed. This paper builds on these observations and suggests that these settlements represent a larger interconnected community. I focus on Indigenous ontological perspectives of community that give us a different way of understanding settlement clusters. This view offers a new perspective on how we might interpret other clusters of pueblo village sites.

**Cruz, Zindy, Kepler Dimas (University of Texas, Rio Grande Valley), Mara Stumpf (University of North Carolina, Charlotte), Mozelle Bowers (University of North Carolina, Charlotte) and Sara Juengst (University of North Carolina, Charlotte)**

[237]

*Lived Experiences of Disease and Trauma among Manteño Burials from Buen Suceso*

Skeletal measures of pathology and trauma can reveal lived experiences of individuals and broader patterns of health and disease within past communities. These are important lines of inquiry at both the individual and community level as they may reflect the identities held by those persons and inequalities present within society. The Manteño burials at Buen Suceso offer an opportunity to examine this, as these individuals lived on the edge of the Manteño sphere of influence and may have lived differently than those more closely associated with urban cores at Jaboncillo or Agua Blanca. In this paper, we present a bioarchaeological analysis of seven individuals buried at Buen Suceso in order to understand their daily lives. Preliminary results indicate significant dental pathology indicating regular maize consumption and periosteal new bone formation suggesting low level chronic stress. Additionally, cutmarks and missing skeletal elements from two of the burials suggests postmortem ritual involving dismemberment and disarticulation of hands and limbs. These

data suggest that Manteño peoples at Buen Suceso shared some cultural traits with the larger Manteño tradition but also were creating new mortuary practices, perhaps because of their liminal position on the landscape.

Cruz, Zindy [237] see Figueroa, Cristian

Cruz, Zindy [237] see Rowe, Sarah

Cruz, Zindy [237] see Stumpf, Mara

Cruz-Palma, Jorge Ezra [20] see McClung de Tapia, Emily

Cruz y Cruz, Tamara [54] see Cordova, Carlos

Cucina, Andrea [3] see Rankle, Chad

Culleton, Brendan [228] see Hoggarth, Julie

### **Cullison, Jennifer**

**[42]**

*A History Cast in Stone: Geochemical Chert Sourcing Using Portable X-Ray Fluorescence (PXRF) in Southern Ontario*  
To test the validity of portable X-Ray Fluorescence (PXRF) for chert sourcing, 32 chert artifacts from the Waterloo Regional Museum in southern Ontario were compared to chert source samples. The use of PXRF in archaeology has raised questions about the method's validity. The portable versions of XRF have lower energy outputs which in turn produces less reliable results than lab based XRF devices. Since chert can have a wide range of internal elemental variation, methods of chemical analysis become difficult. The PXRF utilized was an Olympus Vanta C Series with a silver anode X-ray tube with the Geochem (3-Beam) mode. Measurements were taken from 56 chert source samples. The elemental compositions of the chert source samples were compared to that of the artifacts using discriminant analysis. The results of the discriminant analysis were compared to the visual identifications of the artifacts. The two modes of sourcing had matched at a rate of 76%. The findings suggest that the PXRF may be helpful in determining chert sources, but it should be used in addition to visual identification. There are many potential pitfalls of the use of a low voltage PXRF that must be considered when attempting studies of this nature.

Cummings, Brittany [71] see Pluta, Paul

Cunnar, Geoffrey [94] see Stoner, Edward

Cunningham, Doug [239] see Hurst, Stance

Cunningham, Maria [243] see Hoover, Hannah

### **Curet, L. Antonio (National Museum of the American Indian, Smithsonian Institution)**

**[135]**

*Chair*

**Curet, L. Antonio (National Museum of the American Indian, Smithsonian Institution) and Jorge Estevez (Higuayagua Taino of the Caribbean Inc.)**

[135]

*Where Is the Chief? A Reevaluation of the Concepts of Chiefdoms and Cacicazgos in Caribbean Archaeology*

Traditionally, the terms chiefdoms and cacicazgos have been used throughout the Caribbean as synonyms of stratified sociopolitical systems encountered by Europeans at the time of contact. However, recent data unearthed by the Archaeological Project of the Ceremonial Center of Tibes put into question the applicability of these categories based on generic social models. The goals of this paper are (1) to discuss the history and meanings of the uses of these terms in the Caribbean, (2) identify some of their problems, and (3) propose some alternative strategies.

**Curran, Joseph (University of Nevada, Las Vegas)**

[196]

*How to Find the Unfindable: A New Method for Replicating Perishable Indigenous Technologies of Conflict*

This study provides an innovative multidisciplinary model operationalizing the study of perishable weaponry through experimental archaeology. In this model, I focus on war clubs, a type of Indigenous weapon commonly found across North America. Most of these weapons were made wholly of organic materials that decompose, resulting in low visibility in the archaeological record that creates a challenge for reconstructing their form and potential specialized role in conflict. The goal of this study is to connect archival and ethnohistoric data to archaeological evidence for violent trauma through experimental archaeology, inferring how these weapons were engineered for violent conflict. My methodology utilizes archival, museum study, and experimental archaeology analyses to elaborate on features of design, manufacture, use, and tactics of war club technologies. To operationalize this model, I focus on a case study of conflict technology in the Lower Colorado River Basin from 1540 to 1857. Despite war clubs being prolific and an integral part of the technological systems of conflict in this region, this is the initial in-depth material analysis of this weapon type. From this study we can begin to infer how and why weapons systems were chosen, designed, created, and used through the experiential and embodied process of making.

Curry, Roslyn [58] see Sedig, Jakob

**Curtis, Caitlin (University of Wisconsin, Parkside), Peter Cobb (Hong Kong University), Ani Avagyan (Foundation for Armenian Science and Technology) and Gohar Hovakimyan (Armenian Heritage Development Fund)**

[149]

*“From the Field to the Museum”: A New Educational Outreach Program at Vedi Fortress, Armenia*

This field report recounts our newly realized collaborative children’s educational workshop at the Vedi Fortress in Armenia. In June 2022, the Ararat Plain Southeast Archaeological Project (APSAP) partnered with the National Gallery of Armenia and the Armenian Heritage Development Fund to run our first “From the Field to the Museum” Summer School. Children ages 10–14 from urban Yerevan and the local towns of Vedi, Urtsadzor, and Ararat participated over the course of four days, learning the life cycle of an artifact from the ground to the display. The summer school allowed participants to excavate on site, conduct lab work and analysis, restore their finds in the National Gallery, and create an exhibition of their finds in the museum. Initial formal and informal assessment of the program indicates it was effective and well-received. This program was a true collaboration between an archaeological team, local museum, and local heritage organization, and thus strove to meet the needs and desires of the community from its inception. Integrating the archaeological and museological process in children’s education presents an opportunity to demonstrate the deep value of archaeological heritage and will, hopefully, allow these young students to make strides toward becoming stewards of their country’s past.

Curtis, Mandi [134] see Koon, Hannah

**Cutts, Russell (Emory University—Oxford College)**

[239]

*Broken and Crazed: Quantifying FCR Beyond the Descriptive*

Experiments quantifying the thermal curved-fragment (TCF) model (Cutts et al. 2019) unsurprisingly yielded considerable numbers of fire-cracked rocks (FCR; yet not strictly conforming to TCF definitions). Many exhibited characteristics commonly described in FCR—e.g., broken, cracked, crazed, crenated, crenulated, pocked, pot-lidded, discolored, blackened, reddened, whitened—among other descriptive, yet often unquantified, terminology. Pursuant to advancing the archaeology of fire, other notable fragment forms were detailed during TCF experiments, to be analyzed subsequently. Presented here is another potentially quantifiable thermal curvilinear fragment form, consistently displaying “pyramidal” or “caltrop” shape(s). These—dare we suggest—pyromidal forms typically show four points and sides, with two or more sides being concave/curvilinear. While recognizing that experienced archaeologists can often cursorily “determine” FCR in the field, it stands to reason that such “gut” identifications may not be as-yet scientifically quantified; the archaeology of fire is benefited via such reconciliation. Being extremely difficult to produce during stone knapping processes, these caltrop-shaped fragments are not uncommon in FCR assemblages. Like TCFs, these pyramids are created in hot, long-duration, ground-level fires on flakes, points, and debitage manufactured in anthropogenic knapping activities.

Czermak, Andrea [53] see Schulting, Rick

**Czujko, Stephen (University of Missouri,Columbia), Virginie Renson (University of Missouri), Michael Glascock (University of Missouri Research Reactor), Maria Verde (Dipartimento di Scienze della Terra, dell’Ambiente) and Marcus Rautman**

[126]

*Defining Local versus Nonlocal Ceramic Production at Sardis (Turkey) Using Isotopic Analysis: The Example of Asia Minor Light-Colored Ware*

For over 50 years, material analytic studies have investigated the production and exchange of pottery across Asia Minor from late prehistory through the early Iron Age. Compositional data provided by ceramic petrography, neutron activation (NAA), and X-ray fluorescence (XRF) have successfully differentiated major regional wares and, in many cases, have proposed geographic areas for their origin. A recent NAA study of clays and ceramics from the site of Sardis (Turkey) has established the elemental consistency of local production from Archaic Lydian through Roman periods. This project uses lead and strontium isotopic analysis to clarify the relationship between local products and imported Roman wares. Forty-five ceramic specimens were subjected to isotopic analyses to further assess the provenance of the Asia Minor Light-Colored Ware (AMLC) recovered at Sardis and previously defined as local versus nonlocal based on elemental chemistry. The contribution of the isotopic approach to the understanding of ceramic production and exchange in Sardis and western Anatolia is also evaluated.

Dadiego, Danielle [216] see Otis Charlton, Cynthia

Daggers, Louisa [218] see Plew, Mark

**Daily, Phillip and Virginia Butler (Portland State University)**

[72]

*Incorporating Indigenous Views into Cultural Resource Risk Assessments: A Case Study from Sauvie Island, Oregon*

Threats to cultural resources have pushed archaeologists, land managers, and Indigenous peoples to identify at-risk resources, determine their condition, and provide prioritization recommendations for future preservation. Our project is an example of this process in the form of a case study in cultural resources risk

assessment, along the 34 km long western shoreline of Sauvie Island, Oregon, subject to severe erosion from a range of anthropogenic forces. We developed a site preservation prioritization scheme, seeking to balance western science values and Indigenous perspectives, through a partnership with the Confederated Tribes of the Grand Ronde. We carried out field survey via kayak, assessing the condition of 18 shoreline archaeological sites. We met with Tribal partners seven times over the course of the project to share field results, gain Tribal insights on cultural resource values that overlapped with and diverged from western science values, and develop a mutually agreed upon prioritization scheme, which we applied to Sauvie Island cultural resources. Besides being a useful tool for island land managers prioritizing local preservation efforts, our project is a model for others seeking to build a more holistic approach to prioritization in the face of ongoing and future threats to cultural resources.

Dalmas, Daniel [94] see Todd, Lawrence

### **d'Alpoim Guedes, Jade**

**[96]**

*A Deep History of Human Activity in the Jiuzhaigou National Park*

China's *tuigeng huanlin*, or "Returning Farmland to Forest," program has been widely praised as the world's largest and most successful payment for ecosystem services program, as well as a major contributor to China's dramatic increase in forest cover. In order to preserve the biodiversity and the scenic lakes found in the Jiuzhaigou National Park, and believing that the history of human impact inside the park was relatively short (less than 200–300 years), authorities decided to remove or minimize human impact, resettling nine villages of Amdo Tibetans who originally occupied the area. Since 1999, park policies have prohibited residents from farming and wood cutting, and since 2001, residents can no longer herd animals above the tree line. For the Amdo Tibetans, these narratives are at odds with their own social landscape knowledge of the region. Recent archaeological, archaeobotanical, geomorphological, and zooarchaeological evidence from the park provides evidence of the limitational knowledge Amdo Tibetans had. These forms of knowledge challenge assumptions of shallow time depth of human occupation in the region and shows that rather than harming local biodiversity, intermediate levels of disturbance created by small-scale farming, pastoralism, and tree cutting have contributed to the biodiversity of this region.

d'Alpoim Guedes, Jade [202] see Jiang, Ming

### **Dalpra, Cody**

**[25]**

*Cultural Landscapes and Site Location: An Application of Ethnographic Viewshed Analysis at the Old Town Mimbres Mogollon Site*

In the American Southwest the natural landscape is ever-present. From striking mountains, arroyos, canyons, and mesas, the natural world is forever tied to its occupants. Within the Puebloan world, the natural and cultural landscapes are inseparable. Strong social meanings are embedded within cultural landscapes as networks of natural and constructed places are perceived and made meaningful by communities. This research is focused on how the striking landscape of southern New Mexico influenced the location of one of the most important sites of the region, Old Town. LA 1113, Old Town, is one of the largest Mimbres Mogollon sites likely representing the center for Southern Mimbres culture. Here a large Mimbres phase masonry pueblo overlies a previous Pithouse component, with a later Black Mountain phase pueblo adjacent to the south. The site is undoubtedly important not only because of its size but also its length of occupation. Emphasis of this work is on ethnographic landscapes with information from ethnographic sources and modern consultation. The goal is to allow Native American populations to have a clear voice in the interpretation of ancestral sites tying the cultural landscape to the archaeology resulting in a better understanding of the past.

**Dalton, Jordan (American Museum of Natural History)**

[12]

*Chair***Dalton, Jordan (American Museum of Natural History)**

[12]

*The Use of Balances in Late Andean Prehistory: Merchants or Bureaucrats?*

In prehistory, scales were used by both merchants and bureaucrats and their use had profound impacts on economic and administrative practices. Research in the Andes has not critically addressed the role of balances in political economies, but their presence throughout the Andean coast highlights the need to explore how they were used and by whom. This paper describes research on Andean balances from the Chincha Valley and museum collections that reveals variation in Andean balances that is linked to how they were used. Furthermore, the paper presents the first dates of Andean balances, demonstrating that they were used in the Late Intermediate period (AD 1100–1400), Late Horizon (AD 1400–1532), colonial period (AD 1532–1821), and into the modern day. To conclude, the paper explores how balances could have been used by merchants and bureaucrats and highlights the importance of understanding the use of balances alongside research on currency, storage practices, long-distance exchange, and community integration on the coast. Alongside the major political transformations that occurred from AD 1100 to 1821, the use and prevalence of balances also shifted.

D'Andrea, A. Catherine [60] see Woldekiros, Helina

Dani, Nadel [241] see Rosen, Steven

**Daniels, James (University of California, San Diego; ASM Affiliates Inc.), Hector Neff (California State University, Long Beach) and Heather Thakar (Texas A&M University)**

[68]

*Reaping the Rewards of Incipient Agriculture from the Land to the Sea and the Mangroves In Between*

During the Archaic to Early Formative transition, the Soconusco populations began adopting more sedentary subsistence strategies and investing more in their local environments. Evidence from sediment cores demonstrates that during the Archaic, populations were burning inland landscapes and starting to grow maize. The environmental effects of incipient agriculture along the coastal margins of the Soconusco are addressed in this study by examining pollen from sediment cores, changes in diet, and the evolution of the barrier beach. These lines of evidence point to a relatively sudden change in the coastal environment during the transition from the Archaic to Early Formative. Environmental changes caused by incipient agriculture included the expansion of the mangroves along the eastern Soconusco coast, allowing Early Formative occupants to diversify their subsistence strategies through the exploitation of the biodiversity offered by an expanded mangrove estuary along with continued interior cultivation. The abundance of resources provided by the mangrove-estuary zone supplemented by maize agriculture were primary factors in establishing sedentary village life in the Soconusco. Local environmental investments and technologies allowed initial Early Formative inhabitants to maximize their energy returns.

**Danielson, Andrew (Database of Religious History), Debra Foran (Wilfrid Laurier University), Greg Braun (University of Toronto), Stanley Klassen (University of Toronto) and Grant Ginson [224]***Old Data, New Ideas: Analyzing Legacy Survey Data at Khirbat al-Mukhayyat, Jordan*

In 2000–2001, the Tall Madaba Archaeological Project of the University of Toronto conducted an archaeological survey of the site of Khirbat al-Mukhayyat (Jordan) in anticipation of future archaeological excavation, though ultimately, no excavation of the site was conducted. With the formation of the Khirbat al-

Mukhayyat Archaeological Project in 2014, an important aim was to analyze this extant, legacy material culture from survey. The first goal of this analysis was to create robust hypotheses concerning fluctuations in occupation and the nature of human activity at the site that could be tested against future excavation, and the second goal centered on a test of the methodological extent to which previous survey data of this type may be used in archaeological interpretation. This paper presents the results of this analysis that includes an examination of the ceramics based on chronology and form, as well as distributional maps that identify areas of intensified activity on the site by period. These results are compared with recent excavations at the site. Ultimately, this paper highlights the trajectory of human activity at the site from the Early Bronze Age through to the modern period.

**D'Aprix, Michael (UCL Institute of Archaeology)**

[132]

*Divided Attention: The Need to Reassess the Institutionalization of Archaeology*

Archaeology has reached a point of critical mass in terms of organizational institutionalization. There are simply too many organizations, groups, committees, and subcommittees within archaeology that divide our time and funding. Not only does this leave us in an unsustainable cycle of competition for funding but it also creates barriers of communication between various approaches to archaeology. The convoluted landscape of institutionalization has led to a supported fragmentation of the field, separating specialties and different types of archaeology into distinctly different groups, building facades that prevent meaningful sharing of knowledge and dissemination of information. The groups and organizations that support archaeologists, although well-meaning and often working collaboratively, have entered a state of stagnation and must be reassessed by their members. Furthermore, we must seek to better contextualize these organizations, who are their members? What do their members want? What tools, technologies, and theories do their members employ? How do these things differ between groups like the AIA, SAA, SHA, ACRA, the RPA, and internationally? We need to begin examining this infrastructure and ask the discipline if such a divided landscape is necessary and whether these groups could benefit their members more if their efforts were consolidated.

**Darby, Melissa (Portland State University)**

[35]

*Looking for the Golden Hind's Landfall*

In 1579 Francis Drake and his crew likely careened the Golden Hind in a "fair and good bay" somewhere on the Northwest Coast, rather than the often-cited California shore. This paper will explore and discuss some of the ethnographic evidence, the strong manuscript evidence, and a few artifacts found in the region that may have been from Drake's 1579 summer sojourn on the coast.

Darlington, Emily [102] see Liu, Chin-hsin

**Dartt, Deana (Coastal Band, Chumash)**

[32]

*Discussant*

Darwent, Christyann [218] see Miszaniec, Jason

Darwent, John [218] see Miszaniec, Jason

**Datta, Ranjan and William Marion (Cree First Nation Elder)****[14]***Decolonizing Archaeology: Learning from Indigenous Land and Water Epistemology*

Ongoing colonization of the environment and natural resources has negatively impacted environmental heritage rights in many parts of the world, particularly Indigenous environmental rights and their relationships with the environment. For many Indigenous communities, the history of colonialism became a history of dispossession for Indigenous peoples, their land, water, traditional knowledge, and practice. This paper addresses the ongoing environmental heritage conflict between the Cree First Nation communities' traditional environmental heritage practices and developmental energy projects in Saskatchewan, Canada. Drawing from a relational research framework, I shared my learning reflections from Cree First Nation Communities on how energy projects (particularly pipeline leaks) have negatively impacted Indigenous land, water, and traditional heritage and practices. In this paper, I focus my learnings from the Cree First Nation communities on the following questions: Why and how do developmental projects neglect Indigenous heritage rights, particularly environmental heritage rights? What can be or should be done about it? What are our responsibilities as researchers and educators? In this study, I learned about traditional knowledge-based consultation and solutions to the ongoing challenges of incorporating Indigenous interests into environmental heritage to foster Indigenous environmental heritage rights.

**Davenport, James (University of Missouri)****[27]***The Llamitas of Wiñaymarka: Individual Potters, Communities of Practice, and the Organization of Production for Pacajes Pottery in the Southern Titicaca Basin, Bolivia*

Pacajes pottery is commonly found throughout Qullasuyu, the southern quarter of the Inka empire. Originating in Bolivia, it saw wider distribution after Inka expansion through the region. One specific form common of this style is a shallow plate decorated with small, black stylized llamas repeating at regular intervals over a red interior. Evidence for the organization of Inka pottery production is diverse, and includes production at a central workshop with distribution across a region, as seen in the northern Titicaca basin at Milliraya. This research examines aspects of production and decoration for these llama-decorated plates from three locations in Bolivia: Tiwanaku, Isla Paco, and Urujito, to address the questions: were these plates made in one or multiple locations, and were they made by the same community or different communities of potters? How many individuals comprised that community? And, were the same potters forming and decorating this pottery? Data from brush stroke analysis of the llamas are combined with metrics related to form and macroscopic paste groups to better understand the organization of production for Pacajes pottery in this region and the relationships between these three locations.

**Davidson, Jaron (University of Oklahoma), John Carpenter (INAH), Guadalupe Sánchez (INAH) and Matthew Pailes (University of Oklahoma)****[41]***Early Agricultural Use of Ground Stone in Southern Sonora*

Recent excavation at the site of Las Chachalacas in Quiriego, Sonora produced evidence for Early Agricultural period (EAP) occupation. Dating likely between the Silverbell Interval and the San Pedro phase this settlement would have been contemporaneous with other important early agricultural sites in Sonora, Chihuahua, and Arizona such as La Playa, Cerro Juanaqueña, and several in the Santa Cruz Valley. This research examines ground stone artifacts found at Las Chachalacas to evaluate the relative importance of maize and other seed crops to these very early farmers. Given the likely EAP association, comparisons with ground stone artifact assemblages from other important EAP sites in the US Southwest and northwest Mexico are explored.

**Davies, Benjamin (Yale University) and Jessica Thompson (Yale University)****[159]***A Simulation Approach to Developing Field Standards in Spatial Data Acquisition*

Piece-plotting, or point proveniencing, is a common practice in field archaeology. These data are important for intrasite spatial analysis and evaluating site formation processes. More detailed data collection requires more time and effort, leading to different decisions about size cutoffs between projects. Factors like excavator experience and sedimentary context may also affect overall sampling resolution. From one perspective, this is an optimization problem: how can information gained from fieldwork be maximized, while minimizing the substantial time and financial costs of fieldwork? From another perspective, the problem is duty of care: how can we best represent the original spatial distribution of archaeological materials even as we disrupt those relationships through excavation? Here, we evaluate the influence of different standards (e.g., size cutoffs) on the ability to identify patterning in point provenienced data. We use process-based simulations of data recovery from densely stratified Paleolithic rockshelter sites to calculate (1) the (time and funding) costs associated with plotting finds at different levels of resolution and (2) the changes to data outcomes resulting from different levels of resolution. Findings from the simulations are then discussed in terms of constraints faced by research teams and the imperative to document the record as carefully as possible.

Davies, Benjamin [168] see Braun, David

Davies, Benjamin [159] see Thompson, Jessica

**Davis, Dylan (Columbia University) and Kristina Douglass (Columbia University)**  
[97]

*Behavioral Ecology and Evolutionary Approaches to Human-Environment Dynamics on Southwest Madagascar*  
Madagascar's southwestern coast has been inhabited by coastal foraging and fishing populations for over a millennium. Despite significant environmental changes in southwest Madagascar's environment following human settlement, little is known about the scale, pace, and nature of human settlement and subsequent landscape modification. Recent investigations have systematically surveyed and excavated large swaths of the Velondriake Marine Protected Area, located in the southwest of Madagascar. These studies have made use of satellite remote sensing, predictive modeling guided by human behavioral ecology and niche construction frameworks, and regional survey and excavation strategies. In total, our investigations have recorded hundreds of new archaeological deposits and dozens of new radiocarbon dates that improve our understanding of the region's settlement chronology and distributional patterns. Our results demonstrate that coastal foraging communities in southwest Madagascar settled the landscape in ways that largely follow ideal free distribution and Allee effect principles, demonstrated by settlement density and chronological information. Additionally, over the past 1,000 years, communities have extensively altered the landscape in terms of soil and vegetative characteristics.

**Davis, Jordan (University of Texas, Austin)**  
[225]

*Mapping Marronage and Afro-Indigenous Relationality in Central Peninsular Florida*

Following investigations at the early nineteenth-century African/Black Seminole settlement of Pilaklikaha ("Abraham's Old Town"), Florida has emerged as a key space for examining the complex intersections between archaeologies of marronage and Afro-Indigenous relationality. Beginning with sites in the Caribbean and Central and South America, archaeologists have increasingly suggested that Eurocentric and Afrocentric readings of marronage can obscure important convergences between African Diasporic peoples and the Indigenous peoples of the Americas. To date, however, the majority of maroon "settlements," "villages," and "towns" documented in Florida (including those previously linked to histories of Afro-Indigenous relationality) have not been investigated through archaeology—due in large part to difficulties of defining, locating, accessing, interpreting, and preserving these sites and broader landscapes. This paper addresses efforts to map ancestral African/Black Seminole settlements and landscapes in central peninsular Florida and highlights some of the core challenges and opportunities for exploring marronage and Afro-Indigenous relationality through archaeology.

Davis, Jordan [185] see Skipton, Tara

**Davis, Kaitlyn (Center for Advanced Spatial Technologies, University of Arkansas; PaleoWest)  
[169]**

*Improving Understanding of the Location and Utility of Pueblo Gravel Mulch Fields Using Remote Sensing*

In this paper, I present the preliminary results of a study using remote sensing to document and better understand the functioning of Pueblo agricultural features. This study built on my dissertation research, which focused on recording and understanding precontact and historic Pueblo agricultural practices in the northern Rio Grande area of New Mexico. One of the most interesting dissertation findings was that Pueblo people were successfully growing certain crops in areas where, based on environmental conditions, they could not grow. Cobble-bordered gravel mulch field systems are found in these locations. Gravel mulch is thought to help retain heat and moisture. I attempted to assess the extent of heat retention to determine if it was enough to overcome the environmental constraints, or if other technologies also had to be used. This paper discusses the utility of airborne photogrammetry to find and map gravel mulch fields on the landscape, as well as the potential of handheld and airborne infrared imaging for assessing the thermoregulatory capabilities of gravel mulch fields. Through better understanding the utility and long-term functionality of these gravel mulch fields, communities will be able to assess how they would like to use these features for arid-land farming today.

Davis, Kaitlyn [201] see Genord, Kayla

Davis, Kaitlyn [16] see Klehm, Carla

**Davis, Loren (Oregon State University)  
[107]**

*Discussant*

**[145]**

*Chair*

**Davis, Loren (Oregon State University)  
[89]**

*New Caches from Area B at the Cooper's Ferry Site, Idaho, Reveal Key Technological Insights and Extend the Age of Stemmed Points in the Americas*

Continued analysis of materials excavated from Area B at the Cooper's Ferry site has clarified details about a well dated artifact assemblage containing 11 stemmed projectile points. New radiocarbon analyses show that these stemmed points are significantly older than classic Clovis fluted points and extend the timing of Western Stemmed Tradition technology to match the Bayesian modeled age of initial human occupation in the site's Area A. This assemblage bears stemmed projectile points with a striking technological and morphological resemblance to Late Upper Paleolithic tools from the northwestern Pacific Rim that date to ~20,000–19,000 years ago. The age of these points, together with the apparent cultural links with Paleolithic peoples of northeast Asia, suggest the First Peoples in the Americas arrived via a circum-Pacific coastal route.

Davis, Loren [62] see Lancaster, JD

Davis, Loren [145] see Stone, Samantha

**Dawdy, Shannon (University of Chicago)  
[242]**

*Discussant*

**Dawson, Emily (University of Texas, Austin)****[208]***Consuming Community: Cuisine, Community, and Resilience in Late Colonial New Mexico*

Communities of practice are negotiated daily through the use of cuisine. In colonial settings, these communities are contested and reformed, as colonists and colonized negotiate their new found roles. Following the abandonment of the first New Mexican colony after the 1680 Pueblo Revolt, the Spanish Crown recolonized New Mexico in 1692. This second New Mexican colony was more resilient than the first. Returning colonists had greater familiarity with procuring and producing food in the semiarid environment as they confronted the rise of the Comancheria, American Annexation (1846), and the arrival of the railroad (1878). This paper explores how colonial cuisine and consumption practices at one eighteenth- to nineteenth-century settlement, the Plaza del Embudo, reflect this new found resilience. Archaeological plant micro-remains (phytoliths), macrobotanical remains, and ceramics from middens demonstrate dietary change and continuity as colonists combined familiar and new foods. By reconstructing their colonial meals, I examine the ways their cuisine reflects greater local environmental knowledge and stronger community ties. I argue that the cuisine at PDE represents larger communities of practice among Spanish colonists and Pueblo peoples of New Mexico.

Dawson, Peter [192] see Hvidberg, Madisen

Dawson, Peter [63] see Pennanen, Kelsey

de Anda, Guillermo [81] see Benoit, Taylor

de Anda, Guillermo [81] see Iglesias, Christina

de Anda, Guillermo [81] see Karkkainen, Vanessa

de Anda, Guillermo [81] see Salcido, Ulysses

**de Barros, Philip (Palomar College, professor emeritus)****[166]***Mapping Archaeological Smithing Sites with the Aid of Hammerscale*

In 2013 and 2017 three major smithing sites in the Bitchabe zone of the Bassar region of northern Togo were mapped with GPS: former Bitchabe, Upper Bidjomambe, and Old Bitchobebe, covering 20.3, 14.5, and 5.4 ha, respectively. The sites were variously occupied from the late seventeenth to mid-twentieth centuries. Blacksmiths obtained iron bloom from the Bandjeli area 8–15 km to the north. Elements mapped included house remains and large basin metates for processing sorghum; large iron bloom crushing areas (likumanjool) and iron bloom crushing stones; stone anvils and small likumanjool for pulverizing bloom with small hammerstones; several types of large stone hammers for forging iron into hoes; tuyere fragments; anvil and stone hammer production areas; baobabs, tombs and cemeteries; and middens. To confirm potential anvils were used for hot forging, soil samples were taken to check for hammerscale as taught to me by David Killick. Site occupation periods were estimated using pottery types, ceramic tobacco pipe fragments, and oral traditions about migrations and site abandonment. <sup>14</sup>C dates were not helpful due to the 0–300 BP radiocarbon plateau. The sites were mapped to preserve Bassar cultural patrimony and to compare site spatial organization in terms of residential and ironworking areas.

**de Gregory, J. (USACE Tribal Nations Technical Center of Expertise) and Jennifer Harty (National Guard Bureau)****[209]***Tribal Consultation Program Renewal: An Example from the Air National Guard*

To enhance the Air National Guard's (ANG) Tribal consultation program, the ANG Readiness Center (ANGRC) partnered with the United States Army Corps of Engineers (USACE) Tribal Nations Technical Center of Expertise (TNTCX) to support its complex mission of fulfilling its Federal Trust Responsibility while maintaining the air defense of the United States and ensuring ANG combat readiness. With installations

across the United States and numerous flight patterns, the ANG commands a large footprint that overlaps areas of historic, cultural, and environmental interest to many Federally Recognized Tribes. The TNTCX is a nationwide center with a mission to provide a means of improving USACE's—and other federal agencies'—effectiveness in delivering federal programs and products to Tribal Nations while upholding the tenets of Federal Trust Responsibility and Tribal sovereignty. This presentation summarizes the first year and half of this multiyear effort through a nationwide strategic engagement plan, which was developed at the outset. Forthcoming efforts rely on TNTCX proficiencies in consultation format, consultation training at the regional and national levels, and technological tools developed by the TNTCX. The resulting program emphasizes collaboration with Tribes across the ANG's area of responsibility, thus building trust and relationships between the ANG and its Tribal partners.

**De La Cruz Roldan, Antonio Ricardo and James Bayman (University of Hawai'i at Manoa)**

**[113]**

*Mollusk Foraging and Gendered Labor in Seventeenth-Century Guam, Mariana Islands*

The archaeological investigation of gendered labor in traditional households in the Mariana Islands is still in a nascent stage of development. Archaeological field school excavations by the University of Guam Micronesia Area Research Center and the University of Hawai'i at Mānoa yielded a rich assemblage of cultural materials (e.g., marine shell, ceramics, beads, fishbone). Such materials offered an opportunity to advance research on gendered labor in coastal households. Previous analyses of excavated materials from a multibuilding household offered a new perspective on the spatial dimensions of gendered labor. Activities practiced by women, such as ceramic production, were conducted at a building that was adjacent to a separate (and contemporaneous) structure that was a nexus of activities undertaken by men, such as fishhook-making and woodworking. This presentation summarizes new insights on gendered labor as it was enacted through the foraging, cooking, and consumption of mollusks at a multibuilding household where the labor of men and women was spatially segregated.

**De La Puente-León, Gabriela (Purdue University), Hannah Lipps (Purdue University),  
Francesca Fernandini (Pontifical Catholic University of Peru) and Erik Otárola-Castillo (Purdue University)**

**[176]**

*Time May Change Heritage, but We Can Trace Time: Changes in the Archaeological Heritage of the Cañete Valley (Peru) between the 1960s and Today*

Cultural heritage worldwide is at immediate risk, ranging from minor damage to the complete disappearance of archaeological sites. The causal factors underlying risk increase include human environmental impacts, such as urban expansion and agricultural growth. This problem is critical in Peru, where the Ministry of Culture has identified the existence of 25,000 archaeological sites (2020). However, it is difficult for Peruvian public institutions to monitor sites' up-to-date preservation and protection status due to budget constraints and limited technical capacity. For this reason, we conducted relevant research using remote sensing data in the Cañete valley (Lima, Peru). First, we used aerial images of Cañete taken in the 1960s to locate the presence of archaeological sites in the area and observe their preservation status at that moment. We georeferenced these aerial images using the ArcGIS Pro software. We then compared the quality of the archaeological sites in the area in the 1960s and today, to characterize the presence of risk factors. We assessed the rate of destruction of the archaeological sites identified in the area. This study provides information on the preservation status of archaeological sites in this region and contributes to Peru's national action plan to protect its cultural heritage.

**de la Rosa-Martinez, Marcos (Arizona State University), Alexandra Greenwald (University of Utah),  
Deborah Blom (University of Vermont) and Kelly Knudson (Arizona State University)**

**[29]**

*Stable Isotope Measurements of Weaning Age and Early Childhood Diet in the Ancient Andes: Variation in Early Life Experiences in Tiwanaku Society*

Understanding the complex roles and meanings of breastfeeding practices and childhood provisioning may help bioarchaeologists contextualize paleodietary studies and the role of foodways in the construction and maintenance of social identities. Here, we employ stable isotope measurements ( $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$ ) of weaning age and early childhood diet derived from serial micro-samples of first molar dentin from 12 individuals dating to the Middle Horizon (ca. CE 500–1000) interred in the urban core of Tiwanaku, in the Titicaca Basin. These data allow us to examine interpersonal variation in breastfeeding and weaning practices, along with childhood provisioning, across site sectors, osteologically determined sex, and human body modification. We find a high degree of heterogeneity in weaning ages across Tiwanaku, ranging from 30 to 48 months. Irrespective of the sector within the urban core, females' mean weaning age is older than males' (43.3 vs. 37.3 months). Moreover, the median weaning age of individuals varies by both site sector and cranial modification. These data on breastfeeding, weaning practices, and early childhood provisioning, in concert with cranial shape modification, offer a novel avenue for understanding how age-specific perceptions of social identities were constructed and maintained in the multiethnic, urban core of the Tiwanaku state.

**De León, Adriana (Universidad del Valle de Guatemala), Jocelyne Ponce (Tulane University) and Luisa Galo (Universidad del Valle de Guatemala)**

**[131]**

*Authorship and Practice in Guatemalan Archaeology through an Intersectional Lens*

This intersectional study explores gender and nationality in the production and dissemination of knowledge in Guatemalan archaeology. We examine publication trends in the memoirs of Guatemala's annual archaeology symposium between 1990 and 2019. As the country's main venue of dissemination of archaeological knowledge, the annual symposium is ideal to examine disparities in publication trends through time. We also present the results of a survey to Guatemalan archaeologists on their perceptions of inequality in archaeological practice and their self-identification in terms of gender, occupation, and ethnicity. Our survey shows gendered and ethnical disparities in archaeological practice and production of knowledge. This intersectional study provides a comprehensive perspective on the current status of diversity and inclusion in Guatemalan archaeology.

**De Lucia, Kristin (Colgate University)**

**[83]**

*Discussant*

**[193]**

*Moderator*

De Peña, Felicia [132] see Sosa Aguilar, Danny

de Robert, Pascale [226] see Latosky, Shauna

De Sanctis, Bianca [53] see Wang, Yucheng

de Saxcé, Ariane [210] see Dussubieux, Laure

de Smet, Timothy [176] see Ferguson, Jeffrey

**Dean, Emily (Southern Utah University)****[136]***Improving Educational Accessibility through Collaborative Archaeology*

This presentation focuses on Southern Utah University's forays into community-engaged archaeology through public-private partnerships and collaborative work with federal and state agencies and nonprofit groups in the Colorado Plateau region. Southern Utah University is a small, public, regional, undergraduate institution with many first-generation and non-traditional students. Traditional six-to-eight-week, four-to-six credit hour, field schools are out of reach for most of our students due to family obligations and financial constraints. In addition to empowering multiple stakeholders and giving voices to the voiceless, we find that community and collaborative approaches increase the accessibility of archaeology for both underrepresented student groups and local community members. By partnering with local agencies and organizations, we help carry out needed fieldwork while providing short, local, and affordable opportunities for archaeological instruction.

Archaeology becomes seen as something possible and doable in the here and now, rather than as an exotic, expensive, and esoteric enterprise. These collaborative projects also help foster friendly cooperation between public stakeholders and academic and government researchers in a region of the country where local distrust of "the government" is not uncommon.

Dean, Jeffery [48] see Kessler, Nicholas

Declat-Perez, Mariela [96] see Rodríguez-Delgado, Eric

DeCorse, Christopher [6] see Cromwell, Robert

**Dedrick, Maia (Cornell University) and Luke Auld-Thomas (Tulane University)****[23]***There Are Holes in Our Argument: Karst Landforms and Multispecies Flourishing in Northeastern Yucatán, Mexico*

This paper considers the development of agriculture and society in northeastern Yucatán, Mexico, drawing on evidence from lidar imaging, paleoethnobotany, and isotopic studies. We focus on geological features known as dolines, sinkholes, or rejolladas—round, low areas that dot the regional ground surface. The ecological characteristics of such features (e.g., deep soils, greater moisture) provide opportunities for multispecies flourishing. Within sinkholes, assemblages of plant and animal species as well as geological elements generate emergent properties that differ across features. Human occupants of the region detected and explored the diverse opportunities presented by these microenvironments. While sinkholes have been the focus of scholarly attention for what they enable, equally important is the way these landforms resist agricultural and political economic pressure—they are not amenable to certain land management strategies and pose limits to overexploitation. Their abundant and random distribution makes them difficult to monopolize at a large scale. Taking a landscape perspective, we consider the demonstrated, potential, and failed interactions of species within sinkholes. We examine how the presence of dense, distributed sinkholes, which serve as reservoirs for tropical forest species, shaped regional sociopolitical development.

**Deeley, Kathryn (Georgia Gwinnett College)****[138]***Using Historical African American Scholars' Writings to Understand the Materiality of Nineteenth-Century African American Communities in Annapolis, Maryland*

In exploring how archaeologists can apply concepts and practices from Black Studies in our investigations of the materiality of daily life in the past, the easiest theories to see archaeologically may be those promoted by theorists who were contemporary to the people we are studying. The forerunners of Black Studies today, scholars such as W. E. B. Du Bois, Booker T. Washington, Anna Julia Copper, Nannie Helen Burroughs, and

Mary McLeod Bethune, just to name a few, provide insight into the recommended practices of daily life in the African American community of the nineteenth and early twentieth centuries. We can examine the writings of these scholars as blueprints being offered to the people we are studying archaeologically. This paper explores the writings of late nineteenth- and twentieth-century African American scholars to better understand how their theories can be translated into daily living and therefore reflected in the material culture, looking specifically at the examples of several late nineteenth and early twentieth-century middle-class African American families from Annapolis, Maryland.

Deere, Bobi [136] see Pitblado, Bonnie

Dees, Jessica [181] see Edmondson, Joel

**deFrance, Susan (University of Florida), Neeka Sewnatha (University of Florida), Nicolas Delsol (University of Florida) and Robert Guralnick (University of Florida)**  
[218]

*Ancient DNA of Camelids from Far Southern Peru: Whole Genome Enrichment Methods Reveal Breeding History at Tiwanaku and Inca Sites*

Prior to Spanish colonization, the indigenous peoples of Andean South America (Ecuador, Peru, Bolivia, Chile, Argentina) incorporated domesticated camelids (Camelidae), llamas (*Lama glama*), and alpacas (*Vicugna pacos*) into their economic and ritual life and were skillfully adept at breeding and rearing camelids for different utilitarian and ritual purposes. Recent studies of both modern and archaeological camelid genomics have examined questions of introgression (i.e., hybridization) and cross-breeding between domesticated and wild camelids through time using mitochondrial DNA. This presentation presents the first results of an ancient DNA (aDNA) analysis consisting of the reconstruction of full genomes using Whole Genome Enrichment (WGE) techniques to examine admixture and introgression, phylogenetic relationships, and gene flow in archaeological camelid remains. The samples consist of eight archaeological camelid remains from two prehispanic sites located in far southern Peru. The samples are from Tiwanaku sites located in the Moquegua Valley dating to ca. 600–1000 CE and from a coastal Inca site, Tambo Tacahuay, dating to ca. 1420–1530 CE. Our results provide new insights into ancient breeding practices.

deFrance, Susan [70] see LeFebvre, Michelle

**DeGraffenried, Jennifer (Tsi'ûump Wa'ippe Archaeological Consultants), Kaylee Barkett-Jones (University of Utah) and Andrea Brunelle Runburg (University of Utah)**  
[180]

*Analysis and Comparison of the Paleo-ecological Reconstruction of Simpson Springs to the Archaeological Record of Camels Back Cave in the Bonneville Basin of Utah*

We present a case study that utilizes paleoecological data to further our understanding of the archaeological record in the Bonneville basin of western Utah. We report paleoecological data from Simpson Springs, including pollen, charcoal, and elemental data. We provide the first pollen record from cultural sediments at Camels Back Cave. The data from the two records are compared to shed new light on the archaeological record for the Bonneville basin. Simpson Springs would have been the closest perennial freshwater site to various Holocene human populations intermittently occupying Camels Back Cave during the mid-to-late Holocene. By reconstructing the local vegetation community and spring history at Simpson Springs, we can contextualize the possible resources available during the periods of human occupation and abandonment from Camels Back Cave. This study is one of few paired paleoecological and archaeological site investigations in the Bonneville basin. Major findings include (1) Simpson Springs experienced intermittent wet periods throughout the Holocene, 10,300 cal yr BP, 7800–6300 cal yr BP, 4200–2400 cal yr BP, and 1400 cal yr BP to present; (2) the presence of pollen aggregates suggests human activity as early as 11,100 cal yr BP at Camels Back Cave.

DeGraffenried, Jennifer [41] see Freund, Kyle

DeGraffenried, Jennifer [74] see Hart, Isaac

del Rio, Alfonso [140] see Louderback, Lisbeth

Delagnes, Anne [21] see Spinelli Sanchez, Océane

Delgado, Genesis [57] see Balanzategui, Daniela

**Delgado Espinoza, Florencio**

[12]

*Exchange Competition in Coastal Ecuador during the Late Integration Period*

Exchange relationships were fundamental for the rise of political complexity in ancient coastal Ecuador. Prior to the Spanish conquest, three regional polities compete to dominate long-distance exchange systems in the coast. But, while most of the literature focuses on the Manteños, given to the rich chronicle data, few studies have emphasized on the neighboring Jama-Coaque and Milagro-Quevedo groups. Most of the current reconstructions on coastal exchange systems indicate that the Manteños controlled the large coastal navigation using “balsas” (rafts), trading *Spondylus* and other shells as well as metal objects. A closer look at the material evidence, however, indicates that Manteños did not dominate the entire coastal region. Instead, the entire coast was a terrain of competition and collaboration with the Jama-Coaque and Milagro-Quevedo groups.

**Delgado Orellana, Ayelen (Institute of Archaeology, University College London)**

[77]

*Pristine Forests of Southern Chile? Evidence for a Millennium of Anthropogenic Woodlands*

The relevance of the temperate forests of South America (35°S–55°S) has been acknowledged in ecological and biodiversity terms. Although evidence of human settlements in this vast territory goes back to ~14,600 cal yr BP, these forests are commonly referred to as pristine or natural environments. In Southern Chile, paleoenvironmental studies indicate that although native forests have experienced major disturbance since the Spanish arrival, significant areas of native forest were burned during prehispanic times. This paper explores the use of forest resources and forest disturbance through archaeobotanical data from archaeological sites of the Ceramic period of Southern Chile until the early Hispanic colonial period (1550–450 cal BP). During this period, the record suggests land use intensification in relation to population growth, the propagation of agriculture, animal keeping, and metalworking. Through the analysis of wood charcoal, I focus on discussing how the intensification of crop production and livestock management maintained a mosaic of open fields and woodlands. I aim to contribute to understandings of the long history of human inhabitation of the temperate forest and how it shaped what today is still addressed as a natural environment.

Delque-Kolic, Emmanuelle [166] see Herve, Gwenael

**Delsol, Nicolas (Florida Museum of Natural History—University of Florida)**

[218]

*Chair*

**Delsol, Nicolas (Florida Museum of Natural History—University of Florida)**

[23]

*Following Human-Cattle Assemblage Itineraries: A Non-anthropocentric Perspective on Past Human-Animal Interactions*

Conventional zooarchaeological approaches to the human-animal relationship often offer an anthropocentric perspective where animals mainly serve to fulfill human needs, whether material or symbolic. To address this

issue, I propose a decentered model that I applied to the study of the introduction of cattle in the early postcolumbian Americas. This theoretical model inspired aims at offering a new perspective on how both humans and cattle reciprocally affected each other's lives and social settings. To do so, I am using the theoretical metaphor of the itinerary (Joyce and Gillespie 2015). This metaphor follows the cows' life history as they go through and shape different social fields (Bourdieu 2013), social arenas that bring together animal and human actors. This metaphor is a unique opportunity to analyze different social contexts and processes, such as cow ranching and butchering, by placing them in a single coherent narrative that examines the same nexuses of interaction among people and cattle across time and space in the circum-Caribbean. In this itinerary, the attention is drawn to the human-cattle assemblage, a non-essentialist ontological ensemble where both parties are constantly in flux, gathering new actors and spaces.

Delsol, Nicolas [218] see deFrance, Susan

**DeLuca, Anthony (University of Texas, San Antonio)**  
[235]

*Water, Water, Everywhere, but You Need to Walk to Get a Drink: The Relationship between Water Sources and Teuchitlán Culture Sites in the Tequila Valleys of Jalisco, Mexico*

This study explores the relationship between several Teuchitlán Culture archaeology sites and their proximity to permanent and seasonal water sources within the Tequila Valleys of Jalisco, Mexico. Water is an essential resource that humans cannot live without. With a lengthy dry season of nearly seven months, questions arise regarding access to water and the ability to store water. The largest sites from around the Tequila Valleys were selected for this case study. The Euclidian distance between sites and permanent and seasonal water sources are compared against least-cost path distances in a GIS to determine how much further people needed to travel. The least-cost path distances are then used in energetics calculations to estimate the amount of labor needed to fetch a daily amount of water. Some tentative conclusions are drawn based on site proximity and labor requirements including the possibility that some seasonal water sources were once permanent or site location was chosen on purpose for political means.

**DeLuna, Totsoni**  
[199]

*Ceramic Distribution within the Upper Gila Region*

Ceramic creation and distribution within the Upper Gila region allows us to better understand trade and migration of early southwestern Indigenous peoples. Collections of various ceramic types leave us with more questions than answers, such as who made them? Where did they come from? And what led many of the ceramics to end up where they were found? To address these questions, we analyze petrographic data followed by comparisons of the different percentages of Salado polychromes within the Mimbres-Mogollon region. Additionally, we compare our findings with the San Pedro and Tonto Basin regions in order to develop an understanding of their spatiotemporal differences. Our conclusion on our analysis of ceramics within the Upper Gila aims to address the importance of understanding where ceramics are being made, and where they move around to.

**Demarest, Arthur**  
[158]

*Discussant*

**Demarest, Arthur**  
[93]

*Regimes and the Classic Maya Market Economy "Writ Large"*

The concept of regimes can be critical to the ongoing transformation of understandings of the Classic Maya economy. Currently, many scholars continue to refer to anthropomorphized mythical agents, e.g., exchange

between “Tikal” and “Holmul” or between “Cancuen” and “the highlands,” as simply black boxes inhibiting economic research. With populations in the millions, the southern lowland economic networks produced, imported, processed, and distributed vast quantities of basic commodities, processed goods, and foodstuffs with some specialized centers with supervised “mass production” and non-marketplace contractual export of both commodities and exotics; in other words, a market economy “writ large.” Using tools from contemporary comparative economics, strategic management theory, and network theory, Mayanists are moving beyond “neo-traditional” models that overemphasize marketplaces, domestic production, artisans, and explicitly identified “merchants,” all of which may be specific elements of a market economy but generally at a lower level or the level of final distribution. Collaborative management research and archaeological, epigraphic, and iconographic evidence is beginning to identify full- or part-time agents, some nobles, and leaders in the regimes but with titles not related to commerce. Others carried out the many activities of a large market economy, often supported or at least sanctioned by regime economic managers.

Demarest, Arthur [66] see Arredondo, Ernesto

**DeMuth, Robert (Indiana University, Bloomington, Marshall University)**

[106]

*Where Have All of the Artifacts Gone: Examining the Impact of Structural and Environmental Racism on Site Preservation*

A standard truism in archaeology is that studies that reveal no new material data are as important as those that recover many artifacts and features. This paper examines what this truism means when—by all accounts—data should have been recoverable but was not. Archaeological surveys of the Black neighborhoods from the former West Virginia coal towns of Tams and Wyco revealed very few artifacts, a result that was particularly surprising given the wealth of material data recovered from the white and immigrant communities at Tams. This discrepancy in material data can largely be attributed to the razing and industrial reuse of these Black neighborhoods in the latter half of the twentieth century, when many of these coal towns were more sparsely inhabited if not entirely abandoned. This paper interrogates these results, and attempts to situate them within broader systems of structural and environmental racism. I argue that this near total lack of artifactual data is an effect of racist systems that presents a new dilemma for archaeologists and demonstrates some of the limitations of the discipline.

**Demyan, Marcela, Carey Garland (University of Georgia), Brett Parbus (University of Georgia) and Victor Thompson (University of Georgia)**

[70]

*Comparing Late Archaic Oyster Paleobiology and Volumetric Data from Different Sites along the South Atlantic Coast of Georgia*

For millennia, Indigenous communities around the world have engaged in sustainable shellfish harvesting practices, though they are not without their challenges. Our new research integrates Bayesian radiocarbon modeling of shell ring and mound sites along with research on oyster paleobiology, and shell mound and midden volumetric data from multiple sites along the South Atlantic Bight of the Georgia Coast. These data are used to assess the impact of short-term environmental fluctuations on overall oyster productivity and availability in the region throughout the Late Archaic (5000–3800 cal BP). Previous results indicate significant differences in oyster size and the volume (m<sup>3</sup>) of mollusks collected from rings and mounds. Some sites are characterized by smaller oyster shells, and reduced shell abundance, while others seem to evidence either stability or an increase in size over time. Our new work highlights temporal shifts in these patterns within this time frame and adds to our growing understanding of the environmental challenges that people faced in maintaining sustainable oyster harvesting practices during the Late Archaic.

Demyan, Marcela [113] see Garland, Carey

Demyan, Marcela [142] see Steere, Benjamin

Dena, Ernesto [200] see Gastelum-Strozzi, Alfonso

Denoyer, Allen [199] see Barcelo, Jorge

Denoyer, Allen [199] see Clevenger, Aleesha

**Densel, Allison (University of Michigan)**

**[102]**

*An Examination of Gaza Gray Ware Infant Jar Burials at Tell el-Hesi, Israel*

The study of Gaza Gray Ware (GGW) represents an important opportunity for understanding lifeways in Ottoman-era Palestine. Chiefly produced in Gaza, this ceramic industry was present during the 400 years of Ottoman occupation in the Southern Levant, continuing to a lesser extent into modern times. Favored for their high quality, these vessels were manufactured in large numbers and exported across the region, including into Bedouin territories. The popularity of GGW among the Bedouins is evident in the ceramic assemblages from the cemetery at Tell el-Hesi, Israel. These burials contain significant amounts of GGW, including ibriq water jugs and large water storage containers. The latter type is of particular interest, as all were found to contain the remains of infants. Burying infants in jars is an uncommon practice among the Bedouins who populated the cemetery at Hesi. This begs the question: why were some individuals buried in jars while others were not? What follows is a discussion of the human remains interred at the cemetery, with a particular focus on the age of the individuals found in jars. From this, conclusions are drawn about the function of these unique burials, and possible meanings are suggested.

**Densmore, Allison (University of Wisconsin-Milwaukee)**

**[229]**

*Justifying the Destruction: Ethical Data Access and Reuse*

The inherently destructive nature of archaeological excavations and the massive data output create a complex problem for data management in archaeology. Data are often limited to use by the original researchers or only made accessible to academics through paywalled publications. The archaeological record is a non-renewable resource. Thus, this inaccessibility makes it difficult to justify its destruction. Accessible digital data repositories such as the Digital Archaeological Record (tDAR) provide archaeologists with new ways to preserve, share, and reuse data, thus mitigating the seemingly endemic cycle of destruction, hoarding, and inaccessibility. This research investigates how tDAR and other digital data repositories allow for ethically responsible data access and reuse by looking at two case studies: the Mimbres Pottery Images Digital Database (MimPIDD) and the Salt River Project Digital Library (SRPDL). The structure, content, accessibility, and reuse of these projects are analyzed alongside the FAIR and CARE principles of digital data stewardship to understand how MimPIDD and SRPDL use digital dissemination platforms to create opportunities for meaningful interactions with their data. These accessible and reusable projects should serve as blueprints for the future of ethical and accessible data management in archaeological research and beyond.

**Deo Shaw, Jennie (Salix Archaeological Services LLC) and Joyce LeCompte (Camassia Resource Stewardship)**

**[43]**

*Of Elderberries and Alder: Collaborations on the Paleoethnobotany of the Pacific Northwest*

In 2019, construction monitoring of a large, King County-directed levee replacement project identified a diffuse and deeply buried archaeological site on the Green River, south of Seattle, Washington. This poster presents the results of paleoethnobotanical and AMS analyses conducted on plant materials from precontact-era combustion features and pits. Substantial elderberry deposits and hardwood-filled hearths give insight into riparian food plants, woody resources, and processing techniques so important to Coast Salish lifeways past and present. These data may be utilized by tribes to inform landscape restoration work at the Lower Russell Levee site (45KI1285) and to help refine the "Since Time Immemorial: Tribal Sovereignty in Washington State" curriculum taught in K–12 schools.

DePena, Felicia [171] see Barket, Theresa

**Derian, Alexandra (Trent University)**

**[218]**

*Efficiently Assessing a Large Collection of “Unidentifiable” Faunal Specimens*

Highly fragmented assemblages are challenging for zooarchaeologists. Large numbers of morphologically unidentifiable specimens are time consuming to analyze and may yield little information relevant to project goals. Faced with an assemblage of 50,000 unidentifiable specimens from the Interior Plateau of British Columbia, I employed an expeditious analytical procedure. I subsampled the assemblage to first develop a method for providing approximate specimen counts based on bone weight, and then undertake detailed taphonomic assessments. Through an examination of diaphysis fractures, I identified evidence that bone marrow extraction and weathering contributed to the large number of unidentifiable specimens. This approach allowed me to efficiently quantify and explore the taphonomy of the assemblage. It requires little specialized equipment and can assist zooarchaeologists working with limited budgets and tight time constraints to analyze large assemblages.

DeRose, R. Justin [198] see Finley, Judson

**Derr, Kelly (Historical Research Associates Inc.)**

**[194]**

*Moderator*

**[107]**

*Discussant*

Derr, Kelly [62] see Coughlan, Michael

Dersam, Sari [94] see Dersam, Scott

**Dersam, Scott (Montana State University) and Sari Dersam (Cannon Heritage Consultants)**

**[94]**

*The Mountain Path: Foraging Strategies and Inter-species symbiosis in the Beartooth Mountains, Montana*

Contemporary public land and wilderness management strategies in North America have long indulged the myth of the pristine, untouched ecosystem devoid of human interaction. Modern wilderness areas of the mountain West are not devoid of human influence; rather they represent ecosystems in which an apex species was forcibly removed. Ethological and cultural interactions are limited in modern management practices, which focus on modern anthropogenic influences on the ecosystem. The myth of wilderness frames cultural and human influence as external from—or impactful to—the ecosystem, yet evidence of human behavior and interactions are imprinted throughout these landscapes. This evidence displays continuity of human habitation for thousands of years. Archaeological research in the high elevations of the Greater Yellowstone Ecosystem suggests that mountains are culturally manipulated landscapes, formed through interspecies interaction and bio-cultural symbiosis. Evidence of plant resource manipulation, cultural landscape burning, and interspecies bio-cultural interaction demonstrate the need to treat past anthropogenic and bio-cultural symbiotic influences as part of these ecosystems. Furthermore, the influence of these bio-cultural behaviors and the removal of their effects from the ecosystem should be addressed in future considerations on the health and management of public lands and resources.

**Des Lauriers, Matthew (California State University, San Bernardino)****[164]***Remembering the “Forgotten Peninsula”*

While better known for his exceptional work on households and South American archaeology, Jerry Moore's contribution to sparking a surge in the archaeology of the “Forgotten Peninsula” of Baja California should not go unmentioned. Most importantly, he brought a strong dose of anthropologically informed and oriented archaeology to the Peninsula, which has had the effect of raising the bar for scholars working on this environmentally, culturally, and historically exceptional, but under-researched region. I will here enumerate a few of the areas of ongoing research in Baja California that were impacted and benefited from Jerry Moore's involvement there, ranging from the regional to personal in scale. Finally, an examination of changing household and community organization on Isla Cedros draws, in part, on some of the ideas that he has been kind enough to share with me over the last 20 years—namely, the ways in which the architecture of “small-scale” societies can provide a great deal of illumination about the nature of social interactions within a community. It is past time that we follow the path laid out for us by Dr. Moore and cast our view more widely and better encompass more of the anthropology that archaeology can accomplish.

Des Lauriers, Matthew [92] see Livingston, Christina

DeSantis, Larisa [245] see Burt, Amanda

**Desjardins, Sean (University of Groningen), Scott Rufolo (Canadian Museum of Nature), Shyong En Pan (Canadian Museum of Nature) and Jelke Take (University of Groningen)****[114]***“Place for a Walrus to Haul Out”: Marine Mammals and Polynya Archaeology in Northern Foxe Basin, Nunavut, Arctic Canada*

Across Inuit Nunangat (the traditional Inuit territories of what is now Canada), the Little Ice Age (LIA) climate change episode likely resulted in significant changes in seasonal sea-ice abundance, thereby affecting relatively delicate coastal food webs. In this paper, we present the results-to-date of recent survey and excavation at Uglit (NfHd-1), a Thule Inuit site in northern Foxe Basin, Nunavut. This includes data on seasonality, long-term use of animal resources—particularly small seals and walruses—and chronology (with AMS dating revealing an occupation from the fourteenth to early nineteenth centuries AD). The results support previous work in this region and elsewhere that Arctic hunting regimes situated near polynya systems were highly successful in weathering the effects of the LIA.

Desjardins, Sean [63] see Van Den Hurk, Youri

**Desmond, Abigail (Department of Human Evolutionary Biology, Harvard University)****[214]***Ephemera: Bone Tools as Windows into the “Archaeologically Invisible”*

How does our knowledge of what people made influence our understanding of who people were? In most prehistoric contexts, stone tools serve as default technological benchmarks. This emphasis on stone tools, in turn, foregrounds practices related to hunting and animal processing. Organic technologies more closely linked with child-wearing, transportation, resource collection, clothing, storage, and the like are often absent from our understanding of the remote past. My research focuses on developing methods to account for technologies and practices often deemed “archaeologically invisible.” Specifically, bone tool use-wear can serve as an evidence-based proxy for archaeological materials with low taphonomic survival rates. Microtopographic changes occur on the surface of a bone tool when it is used repeatedly to perform a task. By examining the form and patterning of these changes, it is possible to understand how the tool was used, and in some cases, the crafts the tool was used to produce. This presentation will discuss how bone tool use-wear can be used to account for less visible technologies in deep time, how the use of ethnographic

collections (and ethnographic analogy) can contextualize archaeologically recovered bone tools, and how use-wear data can be documented and shared in high-fidelity, reproducible formats.

**Desrosiers, Pierre (Canadian Museum of History), Doug Odjick (Kitigan Zibi Anishinabeg), Merv Sarazin (Algonquins of Pikwàkanagàn First Nation), Ian Badgley (National Capital Commission) and Lyle Anderson (Public Service and Procurement Canada)**  
[132]

*A First Anishinabe Archaeological Field School in Ottawa*

The first Anishinabe archaeological field school took place in Ottawa, Canada in 2021. It was triggered by the recovery of a precontact stone knife during an excavation in 2019 at the Centre Block on Parliament Hill. Funded by Indigenous Services Canada's Strategic Partnership Initiative, the project was led by the Algonquins of Pikwàkanagàn First Nation and the Kitigan Zibi Anishinabeg, with the support of the Public Service and Procurement Canada, the National Capital Commission and the Canadian Museum of History. An excavation took place in Vincent Massey Park, at the BiFw-101 site, which represents Woodland and Archaic occupations. Nine young adults from both Indigenous communities learned archaeological field methods, followed by two weeks of training in the laboratory for the treatment of recovered artifacts. This Indigenous community-based initiative aimed to provide both communities opportunities to develop their capacities for taking the leadership and the management of archaeological research in the National Capital Region and around their community

Detisch, Michael [148] see Bonzani, Renee

Detry, Cleia [118] see Richter, Kristine

**Detwiler, Natalie (Aventura Archaeology Project) and David Lentz (University of Cincinnati)**  
[243]

*Analysis of Plant Remains from Aventura, an Ancient Maya Site in Northern Belize*

This paper presents an analysis of botanical remains recovered from archaeological contexts at the Aventura site, located in what is now northern Belize. A total of 478 large carbonized plant fragments, 167 flotation samples, and 10 eDNA samples were included in this analysis. Samples were recovered from a range of commoner to elite households across the site and are representative of Preclassic, Classic, and Postclassic contexts. By employing a breadth of techniques to obtain botanical data and analyzing status groups and temporal contexts, we were able to construct a detailed image of the botanical landscape at Aventura. Our results allow a nuanced understanding of the complex relationships between the city's inhabitants and the natural world. Identifications from this study illustrate the active management and utilization of natural resources, patterns of plant use that span time and status distinctions, and contribute to our understanding of how landscapes in this region changed over time and were impacted by ancient Maya occupants.

**Dewey, Christopher**  
[35]

*The Underwater Search for the Remains of the Spanish Manila Galleon Santo Cristo de Burgos*

This paper covers the underwater remote sensing and diver search for the remains of the Spanish Manila galleon *Santo Cristo de Burgos*, also known as the Beeswax Wreck, off the Oregon coast. The all-volunteer Maritime Archaeological Society has conducted a multiyear remote sensing survey and diving expeditions to search the area near the recently discovered ship timbers near Manzanita, Oregon. The paper describes the previously surveyed sectors and the remaining areas to be searched.

**Dewhirst, John (Archaeo Research Ltd.)****[204]***William J. Folan's Canadian Contributions to Archaeology and Ethnohistory*

Although most recognize William Folan's contributions to Mayan archaeology, his early career was devoted to significant national heritage projects in Canada. From 1965 to 1972, Willie carried out two unprecedented large archaeological projects for Parks Canada. It was a ground-breaking time in Canadian archaeology, and Willie was on the cutting edge. In 1965 he excavated all of Fort Côteau-du-Lac, built during the War of 1812. The archaeological structures were stabilized to create a National Historic Park. In 1966, Willie initiated the Yuquot Project, a multidisciplinary study of the Mowachaht village of Yuquot (aka Nootka and Friendly Cove), a National Historic Site on the west coast of Vancouver Island. This first extensive archaeological investigation in the Nuu-chah-nulth (Nootka) culture area unexpectedly revealed the continuity, consistency and gradual change of a single culture over 4,000 years. The Yuquot ethnohistorical research was the basis for Willie's PhD dissertation in anthropology at Southern Illinois University in 1972. In all his projects, Willie generously trained and inspired young, passionate archaeologists and anthropologists. This paper describes Willie's early contributions from Canada.

Di Lallo, Carlotta [25] see White, Chantel

Diachenko, Aleksandr [184] see Ohlrau, René

**Dias, Rita (ERA Arqueologia/ICArEHB), Tiago Pereiro (Era Arqueologia), João Hipólito (ERA Arqueologia), João Fonte (Universidade da Maia, ISMAI) and António Neves (Universidade de Aveiro)****[95]***Odyssey Sensing Project*

Survey is an important tool in archaeological research. It allows us to identify the location of potential archaeological sites as well as understand the main natural features of the landscape. Lately, methodological developments in the field of remote detection have significantly contributed with new applications to archaeological research. The Odyssey Sensing Project seeks to develop an integrated and intuitive GIS platform for archaeologists and heritage technicians. This enables the automatization of the consolidation of heritage, terrain, and landscape data. It also aims at automating data processing, through image processing and AI to help detect archaeological sites. Multiscale data analysis will generate an integrated but multi-layered overlook of a given territory, highlighting its different identified archaeological sites and cultural heritage interest points. Data collection to feed the Algorithm will be done both by cartographic and photographic data mapping, remote detection by passive sensors (photography, multispectral, hyperspectral, and thermal) and active sensors, such as Light Detection and Ranging (airborne lidar) with an UAV. Here we will present the methodology and techniques used and its application to different geographic and chronological settings. New preliminary data from the different techniques will be discussed and explored, showing its potential application in further archaeological projects.

**Diaz, Alice****[5]***Discussant***Diaz, Lucia (Washington University, St. Louis), Sarah Baitzel (Washington University, St. Louis), Arturo Rivera I. (Independent Archaeologist) and Xinyi Liu (Washington University, St. Louis)****[29]***Reconstructing Multiregional Pastoral Strategies in the South-Central Andes*

Ancient Andean pastoralism involved variable herding strategies, including short-term movements within the same ecozone, long-distance caravans for trade, and seasonal mobility across various altitudes. These

multiregional pastoral practices are often difficult to differentiate in the archaeological record, yet they are central for understanding the mobility of humans and animals across ecological floors throughout the prehispanic era. The Terminal Middle Horizon site of Los Batanes (1000–1500 CE) (Tacna, Peru) was an agropastoral settlement founded near the coast in the wake of Tiwanaku collapse. Its location and material culture suggest that residents included humans and animals that moved between the coast and highlands. We use stable isotope analysis of sequential tooth enamel samples to reconstruct camelid diet and seasonal mobility patterns at different temporal and spatial scales. This poster presents oxygen and carbon isotope compositions of modern and archaeological camelid specimen from surface collections on the far southern coast of Peru and the south-central highlands. Isotopic baselines of modern camelids with known feeding and mobility ranges at high temporal resolution will allow us to interpret the frequency and directionality of movement in archaeological camelid samples from Los Batanes, which in turn will reveal ancient herding strategies.

**Díaz Arriola, Luisa (Universidad Nacional Mayor de San Marcos [UNMSM], Lima, Peru.)**  
[12]

*Intercambio a larga distancia del área cultural Ychsma con la costa norte y el Ecuador entre los 900 y 1532 dC*  
El registro arqueológico de la costa central peruana durante los períodos tardíos (900-1532 dC) da cuenta de la presencia de conchas y semillas exóticas, y piedras semi preciosas provenientes de la costa nor peruana y del Ecuador. Su presencia se explica a través de dos posibles rutas: la terrestre y la marítima. La etnohistoria grafica que en el Horizonte Tardío (1450-1532 dC) la ruta marítima devino en una actividad altamente especializada y articuladora de la costa norte, central y sur del Perú y el altiplano peruano boliviano dando lugar a una dinamización económica y contacto entre varios pueblos. En esta investigación proponemos a la ruta marítima como la forma en que los materiales exóticos extra-locales provenientes de la costa norte y del Ecuador habrían llegado al área cultural Ychsma, del Departamento de Lima, Perú. Evidencias arqueológicas provenientes de contextos funerarios procedentes del sitio ychsma de Armatambo (Chorrillos, Lima), asignables al Intermedio Tardío y el Horizonte Tardío muestran las marcadas diferencias en frecuencia y diversidad de materiales y objetos exóticos en ambos períodos, notándose un gran dinamismo económico con la llegada Inca a la costa central peruana.

**Díaz García, Mauricio, Cameron McNeil (Lehman College; Graduate Center, CUNY), Agapito Carballo (PARAC), Samuel Pinto (PARAC) and Reina Hernández (PARAC)**  
[191]

*A Story Written in Sherds: Ceramic Use Patterns at Río Amarillo Reveal Strategies of Survival in the Terminal Classic to Postclassic Copan Valley, Honduras*

The site of Río Amarillo, on the far eastern side of the Copan Valley, was integrated into the economy of the Copan polity during the Classic period. However, the groups surrounding the core of Río Amarillo long outlasted both Copan's center and the secondary center of Río Amarillo. This paper will explore the ceramic evidence from the hinterlands to follow the collapse and rural transformation that happened in the eastern section of the valley. In the Postclassic, groups around Río Amarillo continued to thrive with evidence indicating that ceramic production was either local or involved trade links that skirted those that had been controlled by Copan during the Late Classic period. The limited amount of ceramics recovered from the ceremonial core indicates that, while uninhabited in the Postclassic, this area continued to be a location for ritual activities perhaps as many as 400 years after its abandonment.

Díaz García, Mauricio [85] see Barrios, Edy

Díaz García, Mauricio [52] see Hector Rolando, Aj Xol Ch'ok

Díaz García, Mauricio [52] see McNeil, Cameron

**Dibble, Flint (Cardiff University)**  
[40]

*Moderator*

**Dibble, Flint (Cardiff University)****[212]***Formation Processes and Biases in Big Data*

Much of Harold Dibble's career was focused on the formation processes of the archaeological record. Initially, formation theory encompassed both natural and cultural formation processes; however, in the last few decades most scholars have focused on natural biases in the formation of the archaeological record. Dibble's methods, from the quantification of lithics to the spatial mapping of artifacts to the use of controlled flaking experiments, always aimed to examine both natural and cultural formation processes to understand their impact on archaeological aggregates. This paper examines the impact that cultural formation processes have on archaeological datasets. In the twenty-first century, we've seen a growing trend toward "big data" approaches that aim to aggregate a diverse range of evidence and speak to larger cultural narratives in the past. While natural biases are often accounted for, cultural formation processes are not as well understood. Through an investigation into the zooarchaeological record, it is shown that "big data" (quantification across sites and periods) should first examine the formation processes of our archaeological aggregates and understand various biases (spatial, cultural, conceptual) in our data prior to putting together a "big picture" narrative.

**Diboyan, Larra (Mississippi State University)****[30]***Cultural Genocide and Usurpation of Armenian Places by Azerbaijani Authorities in Disputed Territories*

The Azerbaijan government committed Cultural Genocide against Armenian sites in disputed territories before their most recent 2020 dispute. To fit the nationalistic narrative, Azerbaijan has been destroying or usurping important sites and churches and reshaping the landscape to erase any memory of Armenians. With the use of Armenian and Azerbaijani data, the hope is to locate disputed sites using GIS to identify their future status under Azerbaijan's control. Next, using categorized eras such as Pre-Ottoman and Ottoman for the churches, a Chi-Square test was run to see if more harm would come to Pre or Ottoman-built churches. The objective is to determine whether either era may be in more immediate danger of cultural genocide.

**Diciuccio, Laurel, Nathan Jereb, Caelie Butler, Alyssa Lorain and Shelby Anderson (Portland State University)****[123]***Learning by Doing: Past Foodways, Experimental Archaeology, and Collaborative Research*

Our broad goal is to share on-going research with diverse communities and learn more together about past foodways and food-related technologies. To achieve this, we facilitated several research and training workshops alongside Tribal, Alaska Native, and agency partners from Oregon and Alaska. Our intention was to pair Indigenous and archaeological knowledge and ontologies in an education style that provides a sense of connection to land and place for both facilitators and participants. We co-hosted a workshop on acorn processing and landscape management with archaeologists from the Confederated Tribes of the Grand Ronde; a workshop with Alaska Native partners that centered around processing and utilizing the Arctic cooking vessel; and a third workshop focusing on the tactile experience of creating ceramic cooking vessels with an emphasis on cultural significance. These experiences provide a useful road map for future collaborative training and research between archaeologists and Indigenous groups.

**Dickens, Florence and Samantha Blatt (Idaho State University)****[174]***The Use of Human Remains Detection Dogs to Locate Empty Gravesites after Cultural Exhumation Practices in a Nineteenth-Century Chinese Cemetery in Warren, Idaho*

Archaeological practice demands international preservation of the cultural integrity of Indigenous and historical burials informed by decedent communities. Therefore, it is paramount to explore efficient, minimally invasive methods limiting burial disturbance, while allowing documentation. Coupled with ground-penetrating radar (GPR), human remains detection dogs (HRDs) have been used in archaeological settings for

this purpose. Yet, not all graves contain bodies and not all terrain supports GPR. We present a case in which HRDs aided in locating historical exhumed graves from a nineteenth-century Chinese cemetery in the remote mining town of Warren, Idaho. From 1870 to 1920, 29 individuals were buried here. At this time, Chinese-American immigrants temporarily buried their deceased, exhumed the bodies, processed/boiled bodies to remove tissue, and returned the bones to the villages of the deceased in China. While the rugged, steep, and tree-covered terrain of Warren was impenetrable for GPR, HRDs detected the odor of human decomposition from the exhumed pits, grave mounds, and the location of structural ruins where body processing occurred. HRDs assisted with locating multiple exhumed graves outside the modern fence line and locating one intact grave. These results supported those from archaeological recovery of grave offerings, contributed to re-mapping, and retained site integrity.

**Diederich, Matthew**

[7]

*Hold My Beer! Archaeological Evidence of Alcohol Consumption at the Former Umatilla Chemical Weapons Depot*  
The Umatilla Chemical Weapons Depot (UMCD), a US Army installation located in Boardman Oregon, opened in 1941. The Depot stored a variety of military items, including conventional and chemical weapons. Up to 12% of the nation's chemical weapons were stored at UMCD. After UMCD closed as an active Army installation the facility was transferred to the Oregon Army National Guard (ORARNG) to serve as a training site. The ORARNG has conducted archaeological survey of the training site as part of its ongoing responsibility to manage heritage resources. Along with artifacts associated with the operations of the Depot, a surprising number of alcohol vessels have been identified within the former Depot. This paper looks at the history of the UMCD, from active US Army installation to ORARNG training site, and the significance this installation played in the military history of Oregon and the United States with the through line of alcohol consumption across decades. This paper also addresses the ongoing heritage preservation actions of the ORARNG to preserve a unique part of US military history while still meeting its mission to train soldiers.

**Dierks, Katie (Simon Fraser University), Dylan Hillis (University of Victoria), Denis St. Claire (Coast Heritage Consulting, Tseshaht First Nation) and Iain McKechnie (University of Victoria)**  
[245]

*Osteobiography of an Ancient "Woolly" Dog from Tseshaht Territory on Western Vancouver Island, British Columbia, Canada*

The wool dog is a precontact breed of domesticated dog that has held specific cultural importance within Indigenous communities on the coast of British Columbia and Washington for thousands of years. Although wool dogs no longer persist as a distinct breed on the Northwest Coast, information about these dogs is retained in ethnohistorical records and archaeological heritage sites. This presentation focuses on a dog burial excavated from the ancient Tseshaht village of Kakmakimilh in Barkley Sound, western Vancouver Island, broadly consistent with the Nuuchahnulth variant of the "wool dog." We present a zooarchaeological analysis of the burial and isotopic modeling results to gain perspective on this dog's health and treatment in life and death. Combining cultural information about Indigenous dogs and zooarchaeological research enables deeper insight into how precontact wool dogs were kept and cared for within Tseshaht communities and other Nuuchahnulth communities on the west coast of Vancouver Island.

**Dillehay, Tom**

[61]

*Discussant*

**Dillehay, Tom**

[223]

*Communal Before Domestic? Pre-ceramic Contexts of Exotic Food Adoption in North Peru*

Archaeologists have long hypothesized the causes and conditions of the transition from foraging to food

production. Of specific interest here are the social and ecological conditions generating the adoption of exotic plants. Some of the best-documented paleoecological and archaeological evidence for initial food production and the adoption of cultigens in the Central Andes comes from a variety of middle PreCeramic sites (~7500–6000 cal BP) on the western slopes of the Andes (Nanchoc Valley) and along the Pacific coast (Huaca Prieta area) of north Peru, where macro- and microplant remains and human isotope and dental findings from public and domestic settings suggest that exotic cultigens first appeared as rare to infrequent exchange items and/or ritual offerings in communal sites prior to becoming stable household foods. Interdisciplinary evidence from more than 40 sites in the two study areas are evaluated in terms of this suggestion.

**Dillian, Carolyn (Coastal Carolina University)**

[136]

*Collaborative Archaeology in the Classroom*

Collaborative archaeology is part of a movement that draws on the skills, knowledge, and requests of all stakeholders. Archaeologists are finally recognizing that this represents responsible practice, with benefits for all, and more and more are allocating time, money, and resources toward collaborative projects. Yet, the importance of collaborative efforts in archaeology must be stressed at students' earliest introduction to the field if we are to have a paradigm shift in archaeology toward the universal adoption of collaborative archaeological practices. Here, I will use several case studies to illustrate how collaborative archaeology may be introduced into the undergraduate classroom and beyond.

Dillingham, Eric [8] see Haas, Randy

**Dillingham, Frederic, Bryan Hockett (Bureau of Land Management (retired)) and Isabelle Guerrero (University of Nevada, Reno)**

[25]

*The Tunna' Nosi' Kaiva' Gwaa Archaeological District: Prehistoric Communal Hunting and Pine Nut Harvesting*

Set in a mid-elevation pinyon-juniper woodland, Tunna' Nosi' Kaiva' Gwaa (TNKG) archaeological district is located in the north Bodie Hills, Mineral County, Nevada, USA. The prehistoric component includes seven game corrals, 12 drivelines, over 170 rock rings, nine rock art sites, individual and grouped hunting blinds, and concentrations of shattered projectile points and other lithic scatters. Communal hunting is evident at the end of the Early Archaic and is widespread throughout the 2,100-acre district during the Middle Archaic period. Communal hunting plateaued or declined in the Late Archaic before a substantial rebound in the Late Prehistoric and ethnohistoric periods. Intensive pine nut collecting and caching appears to have co-occurred with Late Prehistoric communal hunting. Layout of the corrals and nearby alignments establishes that there was interactive use of corral features along with evident use during different seasons. TNKG is a keystone site to Numu (Northern Paiute) history, expressing how antelope hunting, pine nut harvesting, and obsidian trading were central activities to the Numu along the western edge of the Great Basin.

**DiMarco, MacKenzie (Indiana University, Bloomington), Carlton Shield Chief Gover (Indiana University, Bloomington) and Sarah Hatcher (Indiana University, Bloomington)**

[116]

*Archaeology in Public Schools*

This paper, focused in Bloomington, Indiana public schools, discusses how students understand and how students experience classroom interactions with objects. This research was conducted in an attempt to increase STEM skills and involvement with archaeology museums. Using collections and archaeology kits, I brought interactive experiences to classrooms to understand how children learn, and how museums (specifically the Indiana Museum of Archaeology and Anthropology) can support or facilitate cultural understanding in classrooms. Field trips to museums are increasingly complex given relevancy issues, budget

restrictions, the ongoing pandemic, and travel logistics. This project sought to reduce barriers to the museum and support teachers through increasing their understanding of museum education; at the same time understanding how traveling collections could make an impact on how students understand archaeology, anthropology, and museums. Additionally, it sought to bridge gaps in literature about how younger students understand objects, and provides another practical avenue for museum to engage elementary school-aged children and their teachers.

Dimas, Kepler [237] see Alanis, Jorge

Dimas, Kepler [237] see Cruz, Zindy

Dimas, Kepler [237] see Rowe, Sarah

DiNapoli, Robert [207] see Rieth, Timothy

**Dine, Harper (Brown University)**

[140]

*Chair*

**Dine, Harper (Brown University) and Steph Miller (University of California, Riverside)**

[140]

*A Microbotanical View of Classic Period Households in Central Yaxuna, Yucatán, Mexico*

The ancient Maya city of Yaxuna was a political and economic center of the northern lowlands in the Middle to Late Preclassic periods (1000 BC–AD 250), and residents continued to occupy the city through the Classic period (AD 250–900) amid geopolitical shifts in the region tied to the rise of Coba and the Late Classic (AD 600–800) construction of a monumental sacbe, or causeway (Sacbe I), connecting the two cities. In this paper, we report microbotanical data from artifact extractions conducted on a sample of ground stones, ceramic sherds, and obsidian blades recovered from horizontal excavations at three domestic groups in Yaxuna and Coba, which occupy central locations in their respective cities. We consider these data in context with the construction history of the house groups and associated deposits, as well as the broader setting pertaining to the construction of Sacbe I and its transformation of the sociopolitical landscape of the Peninsula. Microbotanical evidence provides a lens through which to fortify understandings of household foodways, domestic tool use, and place-making in groups 5E-110 and 5E-112 at Yaxuna.

**Dinkel, Rebecca (University at Albany, SUNY)**

[80]

*Metaphor in Precolumbian Mesoamerica: In Honor of John Justeson*

John Justeson is well-known for contributions to the documentation of Mesoamerican indigenous languages and writing systems. Justeson's work on metaphor has received less attention, given that work on metaphor in precolumbian Mesoamerica is just now gaining traction. Justeson's work stands out as being the first to adopt a conceptual definition of metaphor, where metaphor is not solely defined as its rhetorical form or effect but as a conceptual relationship between distinct domains that are revealing of a given culture's conceptual system at large. Specifically, Justeson (2010) uses a conceptual approach to metaphor to reconstruct concepts for ZERO across precolumbian Mesoamerica. This work is significant for understanding the development of mathematical practice and theory both regionally and globally. This has also allowed for related work that catalogs variations of meaning behind political metaphors in precolumbian Mayan texts and their relation to the political history of the area (Dinkel 2021). Justeson's work on metaphor is thus a significant development in understanding precolumbian Mesoamerican texts by demonstrating how to reconstruct and understand the conceptual systems behind them, which too often remain opaque. This paper revisits Justeson's work on metaphor and avenues for future research on metaphor.

DiStefano, Noah [181] see Moriarty, Matthew

**Dixon, E. James (University of New Mexico)**

[135]

*The Archaeology of Shuká Káa Cave: Final Report*

Shuká Káa Cave, is located on an island in the homeland of the Tlingit and Haida people of Southeast Alaska, and records seven episodes of human activity dating between 12,170 and 1200 cal BP. Three periods of occupation (10,600–10,150, 9930–9450, and 8360–7929 cal BP) contain microblades, bifaces, and expedient tools. The discovery of 10,500 cal BP human remains led to an early application of NAGPRA to very old human remains in the United States. The Tribal, USFS, and research partnerships that developed were nationally recognized as a model for collaborative research in the early twenty-first-century. Shuká Káa (“Man Ahead of Us”) was named by a Council of Elders prior to his reburial in 2008. DNA analyses confirmed that he belonged to an ancestral group (D4h3a) of Native Americans and related (A2) to people living along the Northwest Coast today. Isotopic analyses demonstrate his diet was based primary on sea foods, and obsidian at the site is from Mt. Edziza, BC, and Suemez Island. These data indicate lithic transport by watercraft, established trade networks, coastal navigation, and a mixed maritime/forest economy. A monograph describing this research is currently under peer review and publication is anticipated in 2022 or 2023.

**Dixon-Hundredmark, Chris (Bellevue College) and Cynthia Van Gilder (St. Mary’s College of California)**

[183]

*Parenting in the Past: Investigations into the Spaces, Places, and Traces of Parenting in the Archaeological Record*

This paper seeks to bring together the existing literature and extend its theoretical and methodological implications for an archaeology of parenting, particularly in the times/places where contemporary written records do not exist. While parenting and childhood may be more readily visible to researchers and the public in periods where written records specifically make note of such relationships and behaviors, there is no question that “parenting” has existed as long as there have been human societies. Thus, our paper seeks to develop theoretical models for seeing and understanding the “spaces, places, and traces” of parenting in the deep past. We will utilize a comparative approach drawing on our expertise in two heavily researched regions, Mesoamerica and Polynesia. Along the way we seek to challenge the heteronormative and biologically determinative models of what constitutes a “parent” and identify how archaeologists bring to focus the essential work of parents in the past.

Djakovic, Igor [159] see Soressi, Marie

Djuric, Dragana [240] see Savkovic, Aleksandra

**Dober, Joseph, Rachel Cajigas (University of Alabama), Alexandre Tokovinine (University of Alabama), Aura Barrientos and Francisco Estrada-Belli (Tulane University)**

[127]

*Magnetic Gradiometry Surveys of the Upper and Lower Plazas at La Sufricaya, Guatemala*

Shallow geophysical prospecting methods have been underutilized in the Lowland Mayan regions due, in part, to the densely forested environment. Recent research at La Sufricaya, a Classic Maya site in the Homul region, has produced promising results using magnetic gradiometry to identify features buried below the plaza surface. Despite copious foliage and environmental obstacles, we were able to survey almost 1 ha at La Sufricaya using magnetic gradiometry, and ground-truth many of the identified magnetic anomalies. One of these excavated anomalies appears to be a pit feature carved into bedrock. The regular shape and the depth suggested it was something similar to a chultun or storage pit. Another excavated anomaly revealed a cache

with a lidded vessel. These results not only provide a wealth of new information about the site, but the successful results of the subsequent excavations suggest that magnetic gradiometry and other shallow geophysical methods may be more successful in heavily forested and heavily modified plaza areas than previously assumed.

**Dobrov, Amanda (University of New Mexico) and Kari Schleher (University of New Mexico)**  
[27]

*A Clean Break: A Departure from Standard Typologies through an Investigation of Pottery Temper at Joshua Tree National Park*

This poster will focus on my current master's research and is in joint partnership between the University of New Mexico, Joshua Tree National Park, and the descendant communities from the California Desert. The project developed through consultation with the Twenty-Nine Palms Band of Mission Indians, the San Manuel Band of Mission Indians, and Agua Caliente Band of Cahuilla Indians. These consultations resulted in the research questions being pursued; questions that tribal consultants felt would be most useful and relevant to them. The overarching goal of the project is to create identifiable groups for the pottery found in Joshua Tree National Park. Over the years, a number of different scholars have attempted to create pottery typologies for this area. The results of these studies have yielded confusing, often contradictory descriptions of the pottery and generally unhelpful guides. The typology generated as a part of my master's project will help standardize pottery recording by park and tribal archaeologists to attempt to better connect descendant communities with use areas in the park. This project differs from past attempts to create typologies in this area by focusing on the compositional makeup of the sherds through both binocular and petrographic analysis.

Dockrill, Stephen [173] see Bond, Julie

**Doering, Briana (University of Wyoming)**  
[15]

*Discussant*

**Doering, Briana (University of Wyoming), Grace Stanford (National Park Service), Kassandra Dutro (University of Wyoming) and Joshua Reuther (University of Alaska, Fairbanks)**  
[130]

*What's Hot in Beringia? Cooking during the Pleistocene–Holocene Transition in Central Alaska*

The subsistence traditions of the early Americans residing in Beringia have played a key role in debates surrounding the spread of people across the continent. Hunting and related technologies have garnered the most attention in these debates, which relied heavily on prey-choice and projectile point data. But how did hunted or collected resources become food? Considering variation in processing and cooking techniques in Beringia may yield clues to the subsistence considerations of the early Americans, as well as early American cultures of cooking. Based on an initial analysis of a large late Pleistocene rock-filled hearth, its charcoal, associated fauna, and fatty residues, we argue that food processing styles may be just as important to reconstructing past cultures of early Americans as hunting.

Doering, Briana [29] see Mackie, Madeline

Doering, Briana [44] see Nelson, Fox

Doering, Briana [122] see Stanford, Grace

**Doery, Mairead (University of Arizona)**  
[221]

*Discussant*

**Doery, Mairead (University of Arizona)****[211]***Teaching from the Trenches: Graduate Student Pedagogy in the Undergraduate Archaeology Classroom*

Graduate students occupy a unique space in undergraduate archaeological education. We serve as teaching assistants, field school instructors, and trusted mentors to our undergraduate students, yet unlike professors, we are not viewed as commensurate authorities in the classroom. Simultaneously, we are positioned professionally as “professors in training,” but our experiences and growth as instructors are little prioritized in comparison to conducting research, writing dissertations, and other types of professional development. Graduate students are the future of archaeological education, yet the development and practice of our teaching strategies and philosophies are often overlooked or undervalued within our educational system. This paper considers pedagogy in the undergraduate archaeology classroom from the perspective of graduate students. Drawing on experiences shared by graduate student instructors and tenants of evidenced-based practice from the scholarship of teaching and learning, I address the role of graduate students in teaching college-level archaeology and illuminate the struggles, and successes, we face as educators. Further, I identify unmet needs of graduate student instructors and offer suggestions for graduate students (and their faculty mentors) for cultivating and encouraging more effective teaching practice. Ultimately, this paper seeks to make space for the development of graduate student pedagogy within undergraduate archaeological education.

**Dogandzic, Tamara (Monrepos Archaeological Research Centre& Museum for Human Behavioral Evolution), Li Li (Max Planck Institute for Evolutionary Anthropology) and Shannon McPherron (Max Planck Institute for Evolutionary Anthropology)****[168]***How Flakes Form: Modeling the Initiation and Propagation Phases of Flake Formation*

The shape and size of lithic artifacts are a main source of information about the technical and technological behaviors of past peoples. The mechanics of how flakes are formed is thus one of the central questions of lithic studies and one that Harold Dibble was intently focused on throughout his entire career. Replicative experimental work revealed how manipulating different knapping parameters (hammers, core surfaces, striking angles, platforms) results in different flake outcomes. However, investigating the mechanics of flake fracture can provide a robust model of how these variables are impacting the flake form. According to fracture mechanics studies, flake formation is divided into initiation (crack and bulb formation), propagation (fracture plane traveling through the core), and termination phases (when the fracture plane finishes intersecting the core surface). Here, we used flakes from the Dibble et al. controlled experiments to better understand the mechanics of the initiation and propagation phases of flake formation and to model their impact on flake size and shape. Specifically, we look at initial flake expansion, bulb formation, the placement of the fracture plane, and the relationship between the fracture plane and the core morphology.

**Doherty, Caitlin (Texas A&M University)****[152]***Smith Creek Cave Revisited: An Analysis of Western Stemmed Tradition Raw-Material Procurement Strategies and Lithic Technological Organization in the Bonneville Basin*

At the time of its initial discovery by Alan Bryan nearly 50 years ago, the Mount Moriah occupation at Smith Creek Cave was one of the oldest in the Great Basin and played a critical role in establishing the terminal-Pleistocene age of stemmed-point technology in western North America. Today, what is now known as the Western Stemmed Tradition has been dated to this interval at several sites, and much attention has now been turned to the behaviors this technology represents, with particular emphasis on how early peoples in the Great Basin settled and operated within the region. In this effort, Smith Creek Cave still has much to contribute. As part of an on-going reinvestigation of the curated Smith Creek Cave assemblage, this study examines the lithic materials, incorporating approaches from raw-material and lithic-technological analysis to inform on the settlement strategies employed by the site's earliest occupants, and helps further contextualize emerging patterns of mobility distinguished at a growing number of sites in the local Bonneville Basin and broader Great Basin at large.

**Dolan, Sean (N3B Los Alamos), Christopher Schwartz (Environmental Planning Group LLC) and Patricia Gilman (University of Oklahoma)**

[48]

*Eleventh-Century Aviculture in the Mimbres Valley: An Archaeology of the Human Experience Approach*

For the past 2,000 years, people throughout the US Southwest and Northwest Mexico have woven scarlet macaws and turkeys into their economic, social, and ceremonial fabric. Pueblo groups in the past did not view all birds as being equal, and neither do archaeologists today, as we study macaws and turkeys more so than any other avian species. We have learned a great deal about how people in the Mimbres Valley during the Classic period (CE 1000–1130) managed macaws and turkeys based on isotopes, genetics, and iconography; however, in this paper, we place the human experience at the forefront of archaeological discussions. Using an Archaeology of the Human Experience approach, we examine what it was like for Mimbres aviculturists to live side-by-side raising, caring for, and interacting with these birds daily. We discuss the potential challenges ancient aviculturists dealt with, and we offer solutions for how they kept nonlocal (macaws) and local (turkeys) birds using eleventh-century technology and practices.

**Dombrosky, Jonathan (Crow Canyon Archaeological Center)**

[76]

*Chair*

**Dombrosky, Jonathan (Crow Canyon Archaeological Center)**

[76]

*Ancestral Pueblo Fishing Associated with Mixed Foraging Goals and Environmental Stability in the Middle Rio Grande of New Mexico*

It is a common misconception that fishes were unimportant in the diet of past Pueblo people in the US Southwest. Yet, small numbers of fish remains are consistently recovered from late prehispanic/early historic (ca. AD 1300–1600) archaeological sites in the Middle Rio Grande of New Mexico. The end of drought conditions may have impacted food choice and fishing decisions during this time. I use models from human behavioral ecology to test whether Ancestral Pueblo farmers blended risk minimization and energy maximization foraging strategies. Stable isotope analysis on fish bones reveals the presence of aquatic ecological stability in the protohistoric Middle Rio Grande, which suggests fishing was less risky during this time. Fish body size estimation provides a way to evaluate whether environmental conditions impacted the health of fishes and Ancestral Pueblo food choice. Stable isotope analysis and body size estimation suggest Ancestral Pueblo fishing strategies were associated with energy maximizing and risk-reducing foraging behavior linked with environmental change. This research demonstrates that Ancestral Pueblo fishing decisions were complex, linked to ecological stability, and likely sustainable.

Dombrosky, Jonathan [48] see Conrad, Cyler

Dombrosky, Jonathan [218] see Gilmore, Eric

Domic, Alejandra [68] see Hixon, Sean

Dominguez, Edith [26] see Carballo, David

**Domínguez-Vázquez, Gabriela (Universidad Michoacana de San Nicolás Hidalgo), Dulce María Bocanegra-Ramírez (INICIT-Universidad Michoacana de San Nicolás de Hidalgo) and Isabel Israde-Alcántara (INICIT-Universidad Michoacana de San Nicolás de Hidalgo)**

[13]

*The Effect of Prehispanic Metallurgy on the Environment of a Tropical Rain Forest in Jicalán, Michoacán, Mexico*

A core of 23 cm was recovered from a lake bed, now a dam, in Jicalán Viejo. The core was sampled for

pollen analysis at every centimeter. Pollen analysis describes the presence of a tropical rain forest with tree taxa Moraceae, Ficus, Pouteria, Meliaceae, and Fabaceae. Taxa from disturbed habitats include Asteraceae, Poaceae, Cyperaceae, Chenopodiaceae, Solanaceae, and Euphorbiaceae. *Pinus* and *Quercus*, as allochthonous elements, were observed in low proportions. *Zea mays* and *Cucurbita* pollen was observed in the first 5 cm of the core. The secondary taxa are dominant along the core, suggesting continuous deforestation in the area due to human activities, mainly related to agriculture.

**Donnermeyer, Christopher, Brittney Cardarella (Gifford Pinchot National Forest) and Bobby Saunters (Mt. Hood National Forest)**

[44]

*The Bridal Veil Lumbering Company: Indications of Advancing Technologies and Improved Residential Conditions at Camp A*

Logging was an economic and cultural pillar of the Pacific Northwest. The Bridal Veil Lumbering Company, a logging company operating in the Columbia River Gorge in Oregon State, was the longest continuously operating early lumber mill west of the Mississippi River. The company spanned a timeframe that encompassed a wide range of technologies, immigration trends, labor uprisings and resulting changes in working and living conditions, and safety regulations. Archaeological investigations over the last several decades have revealed the remains of six camps, each an archetype of the technological and cultural milieu of the decade in which it operated. Recent investigations at “Camp A” have indicated shifts in operational and residential conditions during the circa 1917–1922 occupational timeframe of the camp. This poster documents the ongoing investigations at Bridal Veil Camp A with a focus on indications of changing camp operational technologies and improved labor and residential conditions. However, many questions remain, as indicated by both the archaeological record but also by a lack of refuse materials. Research questions that will drive future investigations will also be discussed.

Dore, Christopher [185] see Aitchison, Kenneth

Dosseto, Anthony [207] see Morrison, Alex

Doubles, Zoe [217] see Ritchison, Brandon

**Douglass, John**

[4]

*Moderator*

**Douglass, Kristina (Columbia University)**

[60]

*Discussant*

**Douglass, Kristina (Columbia University) and Tanambelo Rasolondrainy (CeDRATOM, University of Toliara)**

[16]

*Social Memory and Sustainability in Dynamic Landscapes*

We explore the role of social memory in facilitating human survival within the dynamic landscape of southwest Madagascar. By analyzing an oral history archive compiled through interviews with over 100 knowledge holders in the Velondriake Marine Protected Area, we address questions about human adaptation to climate and environmental change. Our work highlights the central role of social memory in facilitating and

regulating adaptive strategies, including community mobility, social networking, and shared resource use among groups of foragers, farmers, herders, and fishers in the region. We discuss the relevance of this work for understanding human adaptation in deeper time. Southwest Madagascar is an ideal place to explore connections between social memory and adaptation. Paleoclimate records reveal dramatic shifts during the Late Holocene, a period coinciding with substantial social and ecological change as human populations grow, introduce non-native plants and animals, and rely on a wider range of subsistence modes. Surface surveys and excavations suggest that short-term occupations and frequent residential mobility have been central features of life on the southwest coast for millennia. Today, mobility remains key to the lives of local communities. We argue that social memory, its maintenance, and transmission are key to sustaining lifeways in dynamic landscapes.

Douglass, Kristina [133] see Buffa, Danielle

Douglass, Kristina [97] see Davis, Dylan

Douglass, Kristina [68] see Hixon, Sean

Douglass, Matthew [168] see Braun, David

Douglass, Matthew [41] see Raskin, Levi

Douglass, Matthew [33] see Reeves, Jonathan

Douglass, McKenna [216] see Tykot, Robert

Doumani Dupuy, Paula [181] see Coil, Reed

Doumani Dupuy, Paula [141] see Tashmanbetova, Zhuldyz

### **Doyel, David (Arizona State Museum)**

**[161]**

*Specialized Pottery Production in Antiquity in the Southwestern United States*

Production of pottery for exchange and/or for markets was an important component of socioeconomic systems in the prehistory of the southwestern United States. Specialized production has been documented among societies of various levels of complexity in diverse settings from the Arizona Strip in the north to the Sonoran Desert in the south. Important questions include when did specialized production become important in local and regional economies and what processes were associated. Evidence suggests that production for exchange was present in the Sonoran Desert of southern Arizona by AD 700, if not before. A strong case for early production on the consumer end is the Mustang site in the Verde River Valley located 90 km east of Phoenix, where 70% of the pottery from an Early Formative component was not locally produced, and multiple production sources were identified including temper types specific to the middle Gila River Valley 80 km (54 mi) distant. Social mechanisms are suggested to account for this distribution. Specialized pottery production, and likely other materials, for exchange and/or markets established conditions for subsequent cultural elaboration in the US Southwest.

### **Doyle, Colin (University of Texas, Austin), Timothy Beach (University of Texas, Austin) and Sheryl Luzzadder-Beach (University of Texas, Austin)**

**[54]**

*Reconstructing the Ancient Maya Wetland Fields of the Central Rio Bravo, Belize*

Lidar acquired in 2016 in northwest Belize revealed an expanse of ~7 km<sup>2</sup> of ancient Maya raised fields and canals along the Rio Bravo floodplain near the ancient Maya site of Wari Camp. This is half of all the wetland field area found from lidar in this region. Excavations and multiproxy data provide the first evidence for this expansive agricultural system's chronology and use. We hypothesize rapid soil erosion occurred at the end of

the Late Preclassic period, coinciding with rising populations and urban construction in the watershed. Erosion quickly stabilized and the floodplain returned to natural aggradation. Radiocarbon dating of paleosols suggests the fields were constructed at the end of the Late Preclassic and beginning of the Early Classic, during a period of cultural transition and regional drought. After initial construction, the system was likely expanded at the end of the Terminal Classic, during more intense drought and cultural transition. Stable carbon isotope ratios suggest maize was a prevalent crop on the fields and the floodplain. While the chronology of these fields reflects the broader regional Maya history, additional excavations, radiocarbon dates, and multiproxy data will refine our understanding of this system's use and its importance for long-term resilience.

**Doyle, James (Penn State University)**  
[238]

*A Time before Color: Revisiting the Codex Style*

In *The Maya Scribe and His World*, Michael D. Coe recognized a “Maya artist of enormous distinction” when analyzing the hand of the painter of the codex-style drinking cup now known as the Metropolitan Vase. This presentation is a reexamination of individual hands in the codex style identified since the landmark Grolier publication, including crucial excavated examples, complicating the clustering of different polychrome styles under this one category. The scenes painted on these vessels, as codified depictions of what would have been widely known historical and mythical narratives, served as bearers of temporal meaning, mnemonics for performance, and symbols of artistic capital as diplomatic gifts. The method of materializing time by painter-scribes on codex-style vessels, as less systematic than their stone working contemporaries, may signal alternate aesthetics of timekeeping. The codex-style corpus thus provides a window into different scribal schools' approaches to bringing a sense of divine time to art and ceremony.

Doyle, Lindsay [15] see Esdale, Julie

**Dozier, Crystal (Wichita State University)**  
[130]

*Fueling Earth Oven Usage: Differential Trends in the Southern and Central Plains*

The work of Alston Thoms and colleagues has highlighted the importance of earth oven cooking technologies throughout the world, and especially within North America. One advantage of earth oven (heated rock) cooking is the relatively conservative use of fire fuel materials, in comparison with direct fire cooking methods. As such, earth oven technologies are theoretically especially adopted in ecological zones where easily acquiring large quantities of fuel is difficult, such as the Great Plains of North America. Indeed, archaeological evidence of earth oven use in the Southern Plains south of the Red River is apparent and appears to increase in intensity through time. However, in the same broad ecological zone within the Central Plains, earth oven usage is much less apparent even though population densities are estimated to be higher. In both regions rocks are plenty and trees are few; however, I posit that intensification on bison products in the northern Southern and Central Plains, especially after 1350 CE, allowed for bison dung patties to be utilized as a low-cost alternative fuel source. This alternative fuel source would reduce the cost of direct-fire cooking technologies.

**Draicchio, Emily (University of New Brunswick)**  
[138]

*Excavating Archives: Locating Enslaved Quarters and Mapping Enslaved People in New Brunswick's Loyalist Landscape*

In the popular imaginary, Canada is considered a land of freedom that is inclusive and without a colonial past. This problematic myth of Canadian exceptionalism is founded on a national history that romanticizes the Underground Railroad, while neglecting Canada's direct participation in the enslavement of Black and Indigenous peoples. Although the study of Canadian slavery is a burgeoning discipline that has been analyzed by historians, archaeologists have failed to consider their role in the field. Given this paucity of archaeological research, little is known concerning the daily lives of the enslaved in Canada. My research addresses this gap

and dismantles a piece of Canada's national narrative by locating, documenting, and analyzing the enslaved quarters of Loyalists in New Brunswick (1783–1834) through the examination of archival material and by completing geographic information system (GIS) site mapping with a storymap component. By combining archaeological and historical methods with an application of Black Studies theories such as Saidiya Hartman's theory of critical fabulation, and Katherine McKittrick and Tiffany Lethabo King's research on Black geographies, I suggest that archival, material, and geospatial evidence can be rearranged to displace colonial accounts, challenge the cartographic erasure of slavery, and reimagine the enslaved experience in Canada.

Drake, Stacy [162] see Slovak, Nicole

**Drees, Svenya (Stony Brook University), Jason Lewis (Stony Brook University), Victoria Greening (Stony Brook University) and Ludovic Slimak (TRACES, CNRS, Toulouse, France)**  
[122]

*Oh Deer: A Zooarchaeological Approach to Understanding Hominin Behavior during the Last Interglacial*

Our understanding of hominin subsistence behavior during the Last Interglacial is limited. Le Grand Abri aux Puces (GAP), a cave in Southern France in the foothills of the Alps, can provide a closer look into subsistence behavior as most of its layers are dated to the Last Interglacial. It has been suggested that hominins living around GAP during deposition of its Layer Alpha were intentionally hunting prime-aged cervid individuals (red and roe deer), potentially as part of some kind of rite of passage. In order to rigorously test this hypothesis, zooarchaeological analyses on all cervid remains from all of the site's layers were performed, including calculation of NISPs, MNEs, MNIs, mortality profiles, and cutmark versus carnivore mark placement patterns. The results help determine if cervids were acquired and treated differently than other species throughout the sequence and answer questions about hominin behavior during the Last Interglacial.

Drees, Svenya [70] see Greening, Victoria

**Dresser-Kluchman, Elizabeth (UC Berkeley)**  
[140]

*Food and Firewood in Gallina, New Mexico*

Growing, collecting, preparing, storing, and using food and fuel are practices that illustrate environmental, community, and interpersonal relationships at the smallest and largest archaeological scales. This paper explores the plant landscape of the Gallina region and phase within the Ancestral Puebloan world. As understandings of this period and its people shift, serious consideration of the agricultural and other plant practices involved in daily life can contribute to a rich landscaping of lives in the relatively elevated, tree-covered hills of the Gallina region in northern New Mexico. Employing data from archives and gray literature as well as novel paleoethnobotanical evidence from excavation and survey, my initial work explores the way in which food and firewood choices left their mark on Gallina homes and hills, asking fundamental questions about the creation of community.

**Drew, Brooke (Indiana State University/Cardno)**  
[104]

*Chair*

**Drew, Brooke (Indiana State University/Cardno)**  
[104]

*Our Dearly Loved Daughter and Sister: A Bioarchaeological, Material Culture, and Archival Case Study in Extraordinary Organic Preservation from Bethel Cemetery, Marion County, Indiana*

During the 2018 Bethel Cemetery Relocation Project, 26 concrete or metallic burial vaults were recovered. Established field protocol dictated that these were to remain unopened and were to be reinterred at the new

cemetery location without further investigation; however, the poor preservation and condition of several concrete vaults necessitated the transfer of their contents to new containers at an off-site lab prior to reburial. This afforded the archaeological team a unique opportunity to document and analyze five remarkably well-preserved late nineteenth- and early twentieth-century caskets and their contents. This poster details one of these cases, Burial 009, the interment of a 30-year-old young mother, wife, daughter, and sister who succumbed to tuberculosis in 1908. The exceptional preservation of organic materials (including her intact wooden casket, burial dress, shoes, and hair) within the vault provide insights into mortuary material culture not often encountered by archaeologists working in historic cemeteries. These observations, coupled with comparisons to contemporary undertakers' catalogs as well as archival and genealogical research, paint a fuller, more vivid and nuanced picture of early twentieth-century mortuary behavior.

**Drew, Madison (University of New Mexico)**

[28]

*An Analysis of Mimbres Ornament Assemblages from the Maxwell Museum of Anthropology and the Museum of Indian Arts and Culture*

Mimbres ornamentation is a largely unexplored topic in recent Southwest archaeology. Through the study of objects of adornment, we have the potential to examine ideas surrounding Mimbres perspectives of personal and group identity, gender, social organization, and ritual beliefs; these are all necessary foundations to understand the Mimbres worldview. Based on my analyses of Mimbres ornament assemblages from the Mattocks, Galaz, Treasure Hill, Walsh, Wheaton-Smith, Old Town Ruin, and West Baker sites housed in the Maxwell Museum of Anthropology and the Museum of Indian Arts and Culture, I evaluate the patterns present in the raw material, ornament form, and depositional context. I also discuss the potential significance of these items and how these results contribute to our understanding of Mimbres ornament use. This preliminary study is part of a larger examination of Mimbres social and ritual life through the lens of ornamentation, which is the topic of my dissertation research.

**Drexler, Carl (Arkansas Archeological Survey)**

[7]

*Caddo and Settler Salt Production at the Holman Springs Site (3SV29), Sevier County, Arkansas*

The Caddo homeland of Arkansas, Louisiana, Oklahoma, and Texas contains one of the major source areas for salt in North America. Coming to the surface as brines, this resource was an important part of local foodways, economies, and political relations for centuries, both for the Caddos and the American settlers who occupied the area beginning in the nineteenth century. This paper examines recent research on the Holman Springs site, a saltworks with significant Caddo and Settler components, both focused on brine reduction. The varying approaches to the same reduction process illuminate differences in the roles of salt within indigenous and Settler cultures, the technologies involved, the economic and political relations entrained, and the environmental impacts created by the process. This research is a collaboration between the Arkansas Archeological Survey and Arkansas Archeological Society.

**Driver, Jonathan (Simon Fraser University) and Karen Schollmeyer (Archaeology Southwest)**

[90]

*Fine-Grained Chronology Reveals Human Impacts on Animal Populations in the Mesa Verde Region of the American Southwest*

In the central Mesa Verde region a combination of numerous excavations and precise chronological control allows us to group selected faunal assemblages into time periods that represent only a few human generations. We examine fauna from eight time periods spanning approximately 700 years in a region that saw substantial changes in human population size and regional settlement organization. We demonstrate that modest human population growth had an immediate impact on abundance of large game animals (notably deer), and local deer populations remain depressed until hunting pressures eased. In contrast, smaller mammals seem to have been much more resilient to hunting and trapping. The most significant change in

faunal procurement was the introduction and intensification of domestic turkey production. This required changes in agricultural production, storage, and labor allocation. Some of the changes that we document would have been so rapid that they would have been observable within one or two human generations and must have had an impact on social relations within and between communities.

Drtikolova-Kaupova, Sylva [3] see Kvetina, Petr

**Druc, Isabelle (University of Wisconsin, Madison)**

[59]

Chair

**Druc, Isabelle (University of Wisconsin, Madison)**

[59]

*Introduction to the Session with a Review of Past Ceramic Technological Studies in the Andes and the Amazon*

As an introduction to this session on technological studies of Andean and Amazonian ceramics, we will briefly review previous research orientations in the field leading to the present investigations and advances in ceramic studies, both archaeometric and technological, in Latin America.

**Druggan, Patrick (Penn State University)**

[228]

*Hierarchical Bayesian Modeling of Early Maize in the Eastern Woodlands*

Maize was ubiquitous in eastern North America at the time of European contact; however, the timing and trajectory of its introduction and adoption by communities across the region remain unclear. Recent redating of collections previously reported to support Middle Woodland maize have rejected original interpretations by either yielding dates centuries younger or  $\delta^{13}\text{C}$  values inconsistent with maize. Yet while these projects have pushed maize introduction centuries later, residue analyses support maize presence centuries earlier than the macrobotanical record in the Great Lakes and central Plains. The challenge for archaeological interpretation of early maize posed by these contrasting proxies is compounded by the absence of formal statistical modeling of dated maize proxies. Instead, a reliance is placed upon calibrated medians and visual inspection. I present a hierarchical Bayesian model for maize introduction constructed from an extensive database of directly accelerator mass spectrometry (AMS) dated specimens which considers chronometric hygiene and differential archaeological sampling intensity across sites. Such formal modeling is a necessary component of testing hypotheses related to the ways in which maize became or did not become a focal resource, and how maize introduction temporally articulates with a constellation of cultural and environmental changes.

Drupka, Beata [251] see Wysocka, Joanna

**Duarte, Trever (Kamehameha Schools) and Jon Tulchin (Kamehameha Schools)**

[43]

*Archaeobotany of Ka'ūpūlehu*

Thousands of charcoal specimens from 23 traditional Hawaiian sites throughout Ka'ūpūlehu Ahupua'a in north Kona were analyzed to see how *kama'aina* ("people of the land") interacted with their environment. Fifty-one plant taxa, including 36 plants of Hawaiian origin and six Polynesian introductions, were identified. Combining charcoal identification and ethnobotanical data, archaeobotanical analysis provides insight to the variety of plant species and the types of activities that took place across Ka'ūpūlehu. It also shows the cultural distribution of plant species in comparison to their natural distribution, indicating patterns of mauka-makai gathering practices, as well as cases of import from outside the *ahupua'a*. The overall pattern expressed by

the findings is one of a dynamic plant community over an 800-year period. Food production, presumably involving arboriculture, is documented by certain taxa, while numerous native taxa indicate construction, tool fabrication, clothing, and other domestic economic activities. Though taxa used as fuel varied through time, no significant negative human impacts are apparent (e.g., extirpations or extinctions).

Dubois-Francoeur, Camille [218] see Freiwald, Carolyn

**Dudgeon, John (Idaho State University, CAMAS), Charles Speer (Idaho State University), Beau Craner (Idaho State University) and Rebecca Hazard (Idaho State University)**

[8]

*Thermal Analysis as a Means to Understand Prehistoric Heat Treatment and Performance Differences in Toolstone*  
Thermal analysis (TGA/DTA/STA) has seen sporadic use as an archaeometric technique. Recent papers on archaeological mortars, plasters, ceramic pigments, and paints have sought to understand recipes or mineralogical components by thermal decomposition, especially where traditional chemical analysis by mass spectrometry is limited due to the multiple forms a chemical compound may be derived from. Much of the thermal analysis literature centers on calcium carbonate species identification, since minerals like calcite, aragonite, and vaterite have the same  $\text{CaCO}_3$  chemical formula, but different thermal decomposition profiles based on their crystalline organization. Here, we build on this prior research to extend the use of thermal analysis for the investigation of water hydration in lithic materials. We explore thermal analysis as a means to understand material property differences in unaltered toolstone, and the performance effect of heat treatment on toolstones that were commonly thermally altered prior to tool manufacture. Using an STA-MS (Simultaneous Thermal Analysis-Mass Spectrometer) to identify water hydration in unmodified and experimentally heat-treated toolstones, our research provides empirical data to understand the effect of variable amounts of hydrated water on toolstone performance and to infer possible heat treatment regimens used by tool manufacturers.

**Dueppen, Stephen (University of Oregon)**

[60]

*Chair*

**Dueppen, Stephen (University of Oregon)**

[60]

*Ancestor Shrines, Diversity, and Distributed Power in West Africa: Understanding the Strength of Flexibility and Cooperation in Sociopolitical Histories*

The archaeology and ethnohistory of western Burkina Faso provide myriad insights into the ways that social and political identities can be simultaneously strong, anchored, and flexible: communities can be simultaneously autonomous, connected, and engaged in collective action; and hierarchies can exist while being extensively shaped, resisted, and/or rejected by other constituencies. This paper explores these topics during three different eras of the region's past at the site of Kirikongo and neighboring settlements in the Mouhoun Bend region, including the dispersed farming settlements of the first millennium BC and early first millennium AD, a period of egalitarian revolution in the twelfth century AD, and new collective identities after the Black Death pandemic in the fourteenth and fifteenth centuries. Anchored by ancestor shrines within the archaeological tells on which they lived, multifamily houses flexibly negotiated and renegotiated identities at the community and regional levels as circumstances changed. Data from western Burkina Faso contributes significantly to political theory in global archaeology by showing the dynamic nature of identities whose strength lies in their flexibility.

Duff, Andrew [109] see Moonkham, Piyawit

**Duffy, Lisa (University of Florida), Kitty Emery (University of Florida) and Antonia Foias (Williams College)**

[84]

*Metabolomic Residue Studies of Foodways in the Motul de San José Polity, Petén, Guatemala*

The subject of ancient Maya cuisine continues to fascinate researchers, but little is known about the “recipes” that may have been used by different people at different times across the Maya world. This study takes a metabolomic approach to residue analysis to compare flavors and preparation methods during the occupation of capital and satellite sites in the Motul de San José polity located on the north shore of the Lake Petén Itzá in Guatemala. While traditional residue analyses target single markers of particular interest, most often cacao in the Maya region, metabolomics test more broadly across a wide range of possible inclusions to provide a multi-marker result including foods such as cacao, but also flavorings, stimulants, or other ingredients used to bind or thicken prepared dishes. We include food preparation tools (grinding stones) and ceramic cooking and serving vessels from households of different status levels, periods of occupation, and local environmental resource availabilities, providing a valuable perspective on foodways of the Petén region.

Duggins, Ryan [197] see Perrotti, Angelina

Dugmore, Andrew [96] see Jackson, Rowan

Duke, C. Trevor [86] see Sorresso, Dominique

**Duke, Daron (Far Western Anthropological Research Group) and Daniel Stueber (University of Victoria)**

[89]

*Haskett: What Is It, When Is It, Where Is It?*

Haskett projectile points were first defined in Idaho by Robert Butler in 1965 and have since figured variously into discussions of non-fluted lanceolate technology from the terminal Pleistocene. As one of a series of similar styles known by other names found along the western cordillera of the Americas—e.g., Sluiceway, Mesa, Agate Basin, El Jobo—an updated context is needed. In this paper, we use new data to describe the most distinguishing technological, temporal, and geographic characteristics of Haskett. Our aim is to better situate Haskett within the broader conversation about the origin and spread of stemmed point technology throughout the continental interior.

Duke, Daron [41] see Freund, Kyle

Duke, Daron [74] see Hart, Isaac

**Duke, Guy (University of Texas, Rio Grande Valley)**

[237]

*Chair*

**Duke, Guy (University of Texas, Rio Grande Valley), Sarah Rowe (University of Texas, Rio Grande Valley) and Sara Juengst (University of North Carolina, Charlotte)**

[237]

*Anarchy in the Trenches: Perspectives on Buen Suceso*

In many ways, Buen Suceso is a unique archaeological site. Not only is it a multicomponent site, with evidence for occupation throughout almost the entirety of the ~2,200-year Valdivia sequence and specialized use by the much later Manteño culture, but it exhibits an occupational history that does not always adhere to the predominant mode of thinking about social organization in Formative era settlements in coastal Ecuador.

Its geographical location in the cloud forest at the base of the Chongon-Colonche hills, 9 km inland in the Manglaralto River valley, places Buen Suceso at an environmental fulcrum point in the region. This paper introduces the site and organizing principles behind the 2022 archaeological field school, providing context for the session. The papers that follow discuss a variety of perspectives on the site along with how the site is understood in the present by archaeologists, students, and the people of the community of Dos Mangas. The ordering of authorship for the papers in this session do not necessarily reflect a hierarchy of intellectual contributions but rather who can pay for membership and meeting registration.

Duke, Guy [237] see Alanis, Jorge

Duke, Guy [237] see Figueroa, Cristian

### **Dukes, Joel**

[187]

*Discussant*

### **Dukes, Joel**

[18]

*A Poet, a President, and Public Engagement: Archaeological Investigations at Longfellow House (Washington's Headquarters National Historic Site, Cambridge, MA)*

Before Henry Wadsworth Longfellow moved into the yellow house on Brattle Street in Cambridge, MA, it was already historic, having served as the home and headquarters for General George Washington in 1775–1776. In anticipation of the upcoming 250th anniversary of the founding of the United States, the NPS Northeast Archeological Resources Program conducted archaeological excavations in front of the home. The project was initiated to ground truth the results of geophysical surveys that identified a wide variety of potential landscape and archaeological features. Excavations in 2022 uncovered elements from an eighteenth-century formal garden and the foundation of an early colonial house. The park's urban setting created an ideal opportunity to collaborate with local researchers, students, and volunteers and engage the public. This paper will discuss the results of the excavations and the unique combination of technology, methodology, and outreach that were used to address research questions and share the project with the public.

Duncan, Neil [43] see Batres, Kimberly

Duncan, Neil [25] see Robinson, Charlotte

### **Dungan, Katherine (Arizona State Museum) and Kathryn MacFarland (Arizona State Museum)** [229]

*The Archaeology of Collections: A History of Practice and Policy in Arizona State Museum Archaeological Collections*

The Arizona State Museum (ASM) was founded in 1893 with the stated purpose of collecting and preserving archaeological material for what was then the territory of Arizona. In step with the larger field of archaeology, the practices and ideas that have shaped ASM's collecting of archaeological material have evolved over the subsequent 130 years, including a long history of archaeological field schools, community-based excavations, academic research projects, and the eventual founding of the Archaeological Repository to house collections from professional cultural resource management work. This paper explores the history of ASM's collecting practices through the analysis of trends in the contents and origins of collections taken in by the museum over time in the context of the museum's policies, legal responsibilities, and stated goals. In doing so, we explore the intersection of theory and practice, particularly how collection practices have articulated with changing archaeological and museological philosophies and how these ideals of collecting relate to the realities of the collection, museum resources, and how the collections are used in the present day and can be used in the future.

Dungan, Katherine [65] see MacFarland, Kathryn

Dunning, Katherine [102] see Maisel, Mary

**Dunning, Nicholas (University of Cincinnati), Jeffrey Brewer (University of Cincinnati), Christopher Carr (University of Cincinnati), Kathryn Reese-Taylor and Armando Anaya Hernández (Universidad Autónoma de Campeche)**

[17]

*How to Build a Better Reservoir: Evolving Ancient Maya Strategies*

The ancient inhabitants of the Elevated Interior Region of the Maya Lowlands spent centuries devising ways to capture and store rainwater in this seasonally arid environment devoid of sizeable permanent surface water bodies. Over time, varied methods were created to ensure a sufficient quantity of water to meet the demands of growing urban populations, as well as to improve the quality of water being collected and stored. We examine examples from Yaxnohcah, Calakmul, Tikal, and elsewhere to illustrate the evolving nature of ancient Maya reservoirs.

Dunning, Nicholas [17] see Cook, Duncan

Dunning, Nicholas [17] see Lentz, David

Dunning, Nicholas [17] see Luzzadder-Beach, Sheryl

Dunning, Nicholas [204] see Reese-Taylor, Kathryn

**Dunning Thierstein, Cynthia (Director ArchaeoConcept)**

[192]

*Chair*

**Dunning Thierstein, Cynthia (Director ArchaeoConcept), John Peterson (ICOMOS/ICAHM) and Anne Comer (New School for Social Research)**

[192]

*Universal Access to Archaeological Parks and Sites: A State of the Question*

What if archaeological sites and parks were accessible to as many people as possible? This question seems obvious, but it is not yet in practice. It is now recognized that everyone should have access to culture, regardless of their social status, cultural background, or mobility possibilities. It is also believed that the process of inclusion brings added value to the institutions that work to implement it. However, for a large part of the population, such as people with disabilities, seniors, and young families, it remains extremely difficult to access certain cultural experiences, especially those in open-air archaeological sites, and thus all over the world. An international working group was formed under the auspices of ICOMOS/ICAHM to present international guidelines for an accessible opening of archaeological and particularly UNESCO World Heritage sites for all. We would like to present our current work with practical examples, and promote universal accessibility among cultural and heritage managers, as well as among interested archaeologists.

**Dupuy, Paula (Nazarbayev University), Elissa Bullion, Galymzhan Kiyasbek, Erbolat Rakhmankulov and Aidyn Zhuniskhanov**

[141]

*A (Different) Pot for Every Grave: Multiscalar Burial Analysis of a Bronze Age Cemetery in Eastern Kazakhstan*

The prehistoric site of Koken, located in the semiarid foothills of eastern Kazakhstan, records a deep history of human occupation spanning the Mesolithic to historical periods. Our research at Koken since 2019 has focused on an integrated habitation, rock art, and cemetery complex dating to the Bronze Age. We will present results from the Koken cemetery where our team has documented over 70 graves through survey, GPR, and excavation. To date, 23 graves have been excavated, allowing for a multiscalar approach to mortuary practices across local to interregional scales. Within the cemetery, different sectors can be distinguished through burial structures, while grave goods suggest material consistency across the burial ground. On a regional scale, body treatment and material inventory overlap with the wide-spread Andronovo

culture sphere. We consider how Koken's position on the geographic periphery of two distinct environmental-cultural zones—the steppe and Inner Asian Mountain Corridor—impacted ideological practice and the materiality of ritual behavior. Interdisciplinary evidence from Koken contributes to broader conversations on how pastoral communities can be both deeply invested in a localized landscape, and embedded in long-distance networks. \* Images of human remains may appear in this presentation.

Đuric, Dragana [240] see Jovanovic, Mihailo

**Dusseldorp, Gerrit (Leiden University; University of Johannesburg), Hans Huisman (Cultural Heritage Agency of the Netherlands), Panagiotis Karkanas (Malcolm H. Wiener Laboratory for Archaeological Science), Femke Reidsma (Leiden University) and Irimi Sifogeorgaki (Leiden University)**

[159]

*How to Deal with Homogeneous Stratigraphies: Excavation, Sampling, and Analysis Strategies at Umhlatuzana Rockshelter, Kwazulu-Natal, South Africa*

To ensure proper context control for archaeological samples, it is crucial that excavations determine and, where possible, follow the natural stratigraphic subdivisions in a sedimentary sequence. In cases with a single, unchanging source of sedimentary input, this may pose challenges. We present our strategies to deal with a >2 m deep homogeneous Pleistocene stratigraphy at Umhlatuzana rockshelter in South Africa, yielding archaeological remains from the Middle Stone Age. The site was originally excavated during a rescue project in 5–10 cm deep artificial spits for lack of visible stratigraphy. We revisited the shelter in 2018 and 2019. We integrate current standard practice such as piece-plotting archaeological materials with digital methods such as cluster analysis and geoarchaeological analyses (e.g., micromorphology, sedimentological analyses, geochemical analyses) to track the different sources of sedimentary input. We also develop an intensive sediment sampling strategy to illuminate geochemical variation within the sequence and postdepositional alterations affecting preservation conditions. We manage to reconstruct a natural stratigraphy of the site combining these methodologies, resulting in a radically changed understanding of the stratigraphy, depositional environment, and mechanisms of postdepositional disturbance.

Dusseldorp, Gerrit [171] see Schmid, Viola

**Dussol, Lydie (Université Côte d'Azur), Kenneth Hirth (Penn State University) and Timothy Scheffler (University of Hawaii, Hilo)**

[150]

*Holocene Vegetation Changes and Fuel Use in the Honduran Highlands: The Anthracological Sequence of El Gigante Rockshelter (11,000–1000 BP)*

Holocene pollen sequences have highlighted several episodes of vegetation opening in Central America since the Archaic period, which have often been related to the dispersal of nomadic slash-and-burn agriculturalists from the Central Mexican Highlands. However, few archaeobotanical data from archaeological sites have been available to date to examine woodland changes in relation to prehistoric occupations in the Highlands. El Gigante Rockshelter, Honduras, was occupied in intermittent phases over the last 11 millennia according to excavations conducted in 2001–2002 by Pennsylvania State University. The anthracological (charcoal) analysis of this long and well-established sequence allows us to explore changes in the fuel economy of these populations as a result of climatic, ecological, economic, and cultural changes from the Paleoindian to the Classic period. This unique case study helps us understand the processes of anthropogenic landscapes construction in prehistoric Mesoamerica.

**Dussubieux, Laure (Field Museum of Natural History)**

[210]

*Chair*

**Dussubieux, Laure (Field Museum of Natural History), Ariane de Saxcé (German Archaeological Institute [KAAK—Bonn]), Nimal Perera (Department of Archaeology of Sri Lanka) and Mangala Katugampola (University of Kelaniya)**

[210]

*Glass Production in Sri Lanka: New Data from Giribawa*

A little more than 25 years ago, glass furnaces were discovered at Giribawa, a site located in the northwest part of the island of Sri Lanka. Chemical analysis revealed that raw glass and glass beads were certainly manufactured at this site. Excavations have resumed at Giribawa in 2022, with a special focus on the glass production area, to address a number of questions related to the glass technology and the chronology of the glass production that remained unanswered following the first exploration of the site. A range of glass artifacts including finished glass beads, glass tubes, chunks of raw materials, and glass adhering to refractory materials and ceramics were analyzed via laser ablation-inductively coupled plasma-mass spectrometry and results will be presented here. Evidence of ancient glass production in South Asia is scarce and a better knowledge of the glass production at Giribawa is important to understand the glass trade and trading connection within Sri Lanka and between Sri Lanka and the rest of the Indian Ocean.

Dussubieux, Laure [210] see Abraham, Shinu Anna

Dussubieux, Laure [210] see Fenn, Thomas

Dussubieux, Laure [210] see Larson, Katherine

Dussubieux, Laure [210] see Sarathi, Akshay

Dussubieux, Laure [210] see Wood, Marilee

Dutro, Cassandra [130] see Doering, Briana

**DuVall, Shina (National Park Service, Alaska)**

[38]

*Discussant*

**Duwe, Samuel (University of Oklahoma), Chris Garcia (Pueblo of Acoma), Everett Garcia (Pueblo of Acoma), Kurt Riley (Pueblo of Acoma) and Karl Pedro (Pueblo of Acoma)**

[181]

*The Pueblo of Acoma's Cultural Inheritance and Archaeological Partnership in "The Lands Between" of Southeastern Utah*

Amidst the pandemic, the authors (a group of individuals from the Pueblo of Acoma, academics, and nonprofit organizations) planned and gathered in southeastern Utah to begin a project in 2021 to explore and strengthen Acoma's deep and inalienable connections to the north. We soon found that the process of building meaningful and long-lasting partnerships was as important, if not more so, than our work itself. This poster details the steps we took in 2022 to continue to build a respectful, meaningful, and lasting community-based partnership: to facilitate Acoma's pilgrimage to their ancestral homes near the place of their emergence, and to work with archaeologists and land managers to ensure continued access and protection of Acoma's cultural inheritance established by the First Ancestors. This work contributes to Pueblo's goals of building a healthy and sustainable future for coming generations.

**Dye, David (University of Memphis)**

[213]

*Mississippian Warfare and Social Houses*

Within a hundred years of Cahokia's Big Bang around AD 1050, warfare becomes evident in the construction of defensive structures, especially massive, bastioned palisades. The first of these palisades at Cahokia dates to ca. AD 1135 and stands as the earliest Mississippian fortified community. This signaling of intensive and

organized warfare, as opposed to prior episodes of feuding and raiding, marks a dramatic shift in interpolity conflict, social competition, and violence. By AD 1250, multiple towns throughout the Mississippian world increasingly engaged in building defensive berms, moats, and palisades. Escalated violence is also evident in iconography, ritual practice, and skeletal trauma. In this paper I argue that the ascendancy or transformation in Mississippian warfare was due to competition among powerful and wealthy families that constituted noble or social houses. The social house model paves the way for envisioning Mississippian warfare as an outgrowth of dynastic challenges among interconnected families that competed for power, prestige, resources, and wealth.

**Dye, Thomas (University of Hawai'i)**  
**[207]**

*Discussant*

Dysart, John [98] see Gonzalez-Tennant, Edward

**Dziki, Gabriela (University College London) and Martin Menz (University of Michigan)**  
**[243]**

*An Elite Household in the Late to Terminal Classic Periods at Aventura*

This paper examines an elite household, Group 48, at the site of Aventura, Belize. Group 48 is located east and adjacent to Group C, one of the six adjoining plaza groups that form Aventura's city center. It is also situated at the north end of an intersite causeway and adjacent and south of the proposed salt marketplace at Aventura. Group 48 displays a long history of occupation, from the Late Early Classic/Middle Classic period through to the Terminal Classic period. The Terminal Classic included the construction of small plaza-level buildings and additions. Group 48 is bounded by structures to the east, south, and west, and open to the north, and its structures range from 0.43 m to 2.6 m in height, with the eastern structure being the tallest. Exhibiting an impressive Terminal Classic midden, together with its focal location at the site, Group 48 and its elite household suggest an influential family occupied it. This paper explores elite architecture, activity areas, and burial practices of the Late to Terminal Classic transition, looking at the daily lives of an elite household.

**Earley, Caitlin (University of Washington)**  
**[172]**

*Chair*

**Earley, Caitlin (University of Washington)**  
**[238]**

*Media and Meaning in The Maya Scribe and His World*

Among Michael Coe's many contributions to Maya studies with his landmark show and publication *The Maya Scribe and His World* was the observation that imagery on Classic Maya ceramics is different from imagery on carved stone monuments. Coe notes this gap between ceramic and stone imagery several times in his catalogue, and indeed, we could consider this a driving force for the exhibition itself. Yet the ramifications of that gap remain largely unexplored. In this paper, I examine our current understanding of imagery on ceramic vessels versus imagery on stone sculpture, focusing particularly on representations of violence and sacrifice. Including objects from *The Maya Scribe and His World* as well as works that retain their primary context, I consider how the provenience of objects helps us approach this topic—and what is lost when a Maya ceramic is severed from its past.

Earley, Caitlin [172] see Sánchez Gamboa, Ángel

**Eben, Michon (Reno-Sparks Indian Colony)****[144]***Discussant***Ebert, Claire (University of Pittsburgh), John Walden (Harvard University), Victor Gonzales Avendano (University of Pittsburgh), Rafael Guerra (University of New Mexico) and Jaime Awe (Northern Arizona University)****[129]***Documenting Domestic Economies in the Eastern Maya Lowlands through Obsidian Exchange*

Households composed the most basic unit of economic production and consumption in ancient Maya societies, and articulated directly with broader social and political processes. In addition to organizing daily tasks and agricultural production, households served as a point of engagement in the domestic economy for the acquisition of commodities needed for basic subsistence. Obsidian was an essential commodity since it provided the “cutting edge” for Maya communities, and others across Mesoamerica. This study focuses on characterizing household-level economic systems using geochemical sourcing of obsidian from Cahal Pech and Lower Dover, located in west-central Belize, from the Preclassic through Terminal Classic periods (~1000 BC–AD 900). Technological and portable X-ray fluorescence (pXRF) analyses of obsidian artifacts indicate the presence of decentralized domestic exchange systems based on differential consumption of obsidian source material between households through time. This contrasts with traditional arguments that attribute the emergence of socioeconomic complexity to elite institutions that controlled local distribution systems of exotic items like obsidian. Our data suggest, instead, that household consumption and exchange were essential links for local Maya communities to larger regional socioeconomic systems.

Ebert, Claire [11] see Awe, Jaime

Ebert, Claire [101] see Ellis, Olivia

Ebert, Claire [76] see Meyer, Brett

Ebert, Claire [45] see Roa, Ian

Ebert, Claire [245] see Tomczyk, Weronika

Ebert, Claire [165] see Walden, John

**Echenique, Ester and Florencia Avila (Conicet)****[59]***Constructing Technical Identity among Past and Present Potters' Communities in the Talina Valley, Southern Bolivia*

Ceramic studies, particularly those based on ethnographic data, have demonstrated the relationship between technological choices and identity construction. However, this crossover can be challenging as identity is generally self-defined. This relationship is only possible if we understand technology as a social phenomenon that integrates material, social, and symbolic components, which enables understanding certain choices as deliberate expressions of social identity. In this sense, the concept of technical identity is useful as it incorporates different facets of pottery identity, which implies an intricate set of boundaries or networks of social interaction. We explore how technical identity can be approached from a multiscale perspective, incorporating ethnographic, archaeological, and archaeometric data. Our goal is to integrate (1) the study of technological traditions through time, (2) the construction of possible communities of practice, and (3) their impact on processes of social and regional integration. The Chicha Region and in particular the Talina Valley, in southern Andean Bolivia, offer an excellent setting to explore this issue as it was a densely occupied area in precolonial times and an area of active pottery production, both past and present.

Echenique, Ester [206] see Correa, Jacqueline

Echeverría, Javier [126] see Henkin, Joshua

Eckerle, William [82] see Santarone, Paul

**Eckert, Suzanne (Arizona State Museum, RPA)**

**[86]**

*Discussant*

Eckert, Suzanne [176] see Ferguson, Jeffrey

Eckert, Suzanne [86] see Schleher, Kari

**Eddy, Zoe (Harvard University)**

**[153]**

*Discussant*

**Edinborough, Kevan (University of Melbourne)**

**[184]**

*Demography, Heritage, and Archaeology: A View from Australia*

This paper presents a cautionary case study in heritage and archaeology from Melbourne, Victoria, Australia, which is undergoing a rapid transformation due to an unprecedented program of urban and regional development. Following the author's previous work in Europe and the Pacific Northwest, a multi-period case study is presented using historical, lithic, and radiometric data. On one hand these results shed new light on mid to late Holocene settlement and demography in the region, but on the other they suggest an alarming bias exists in the archaeological record that directly relates to European colonization.

Edmonds, Mackenzie [124] see Wells, Joshua

**Edmondson, Joel (University of West Georgia), Nathan Lawres (University of West Georgia),**

**Jessica Dees (University of West Georgia) and Andrew Carter (University of West Georgia)**

**[181]**

*Sowing the Seeds of Curiosity One Visitor at a Thyme: The UWG Interpretive Anthropology Garden Exhibit*

Foodways provide an important window for us to view important components of cultures, and they provide an important vehicle for engaging a broad audience in an educational way. They are something that we can all relate to because we all participate in them in one way or another. The University of West Georgia's Interpretive Anthropology Garden is an experiment in creating a unique pedagogical resource aimed at engaging a broad audience with foodways by acting as both a botanical archive and an interpretive exhibit. At its core, it is a seasonally-rotating exhibit of four themed gardens, each of which aligns with courses taught in the Anthropology Program. As such, the garden is aligned with course curricula and includes plants discussed in classes. As an exhibit, the aim is to engage students and others with educational content through interpretive signage. As a garden, it allows them to observe and interact with previously unknown or unfamiliar plants, but also to harvest the very plants discussed in classes. By taking a dual-pronged approach, the Interpretive Anthropology Garden provides a unique pedagogical resource.

Edmunson-Morton, Tiah [7] see Rose, Chelsea

Edson, Curtis [44] see Whitehead, William

**Edwards, Briece (Confederated Tribes of Grand Ronde), Greg Archuleta (Confederated Tribes of Grand Ronde), Chris Rempel (Confederated Tribes of Grand Ronde) and Cheryl Pouley (Confederated Tribes of Grand Ronde)**

[62]

*It's All about Context: How Culturally Informed Landscape Understandings Expand Knowledge of Archaeological Site Interpretation*

Tribal Cultural Landscapes are intimate and comprehensive understandings of place rooted in the ecologies, histories, and practices of those communities who create them. For the Confederated Tribes of Grand Ronde (CTGR), these include all lands between the Cascade and Coast Mountain Ranges of Oregon, from the Columbia River to Mount Shasta. Due to ever growing settlement, population pressures, development, associated land use changes, the US Army Corps of Engineers installed 13 reservoirs beginning in the 1950s, known as the Willamette Valley Project. Under contract to USACE, the CTGR-Tribal Historic Preservation Office undertook a two-year study to synthesize those portions of its Tribal Cultural understanding of the Willamette Valley Project relevant to contemporary land management. While this study encompasses numerous archaeological cultural resources, it moves beyond traditional academic analysis by situating those same loci into the full complexities of daily life—ecological, historical, and cultural—enacted over millennia by the ancestors of the Tribe. The study further links these loci to ongoing cultural practices and provides insights into how agencies may better fulfill their cultural resource obligations to living communities.

Edwards, Briece [14] see Gonzalez, Sara

Edwards, Briece [69] see Hawks, Dustin

Edwards, Briece [72] see Pouley, Cheryl

**Edwards, Nicolette (Southern Methodist University), Karen Lupo (Southern Methodist University) and Dave Schmitt (Southern Methodist University)**

[203]

*Of Foragers and Farmers: The Influence of Population Interaction on Faunal Diversity and Abundances in Zooarchaeological Assemblages*

Zooarchaeological measures of faunal diversity are commonly used to assess prehistoric diet breadth, paleoenvironmental conditions, hunting technology, and economic orientation. In addition, hunter-gatherers are usually assumed to have more diverse faunal assemblages in comparison to food producers. Ethnoarchaeological data from central African neighboring foragers and farmers that have ongoing mutualistic interactions provides an exception. Although foragers directly procure a more diverse array of prey than farmers, the faunal assemblages associated with farmers are more diverse than those associated with foragers. Economic interactions including gift-giving, exchange, and debt repayment inflate the diversity of farmer-produced assemblages relative to those of foragers. These results support a reevaluation of the circumstances that produced forager faunal assemblages, especially when economic interaction involving the exchange of wild prey is possible. The results also provide an important guide to identifying prehistoric forager-food producer interactions in the zooarchaeological record.

**Edwards, Richard (University of Wisconsin, Milwaukee, Archaeological Research Laboratory Center)**

[140]

*Oneota Cuisine: Tradition, Identity, and Community*

Food is a persistent symbol of identity, signaling both membership and distinction within communities at multiple scales. A combination of macrobotanical, zooarchaeological, isotopic, and ceramic data are used to make inferences about Oneota culinary practices. This paper examines the way that cuisines connected and divided members of Late Precontact Oneota (ca. AD 1050–1450) communities across the western Great Lakes Region in North America. It focuses on the identification of the identification of distinct ingredients that defined local cuisines within the larger maize-based diet.

Eeckhout, Peter [203] see Erauw, Céline  
 Eeckhout, Peter [163] see Suarez Gonzalez, Nathalie

Eerkens, Jelmer [163] see Buonasera, Tammy  
 Eerkens, Jelmer [97] see Chen, Jennifer

Egan, Rachel [167] see Simon, Rebecca

**Egeland, Charles (UNC, Greensboro)**  
**[56]**  
*Discussant*

**Egeland, Charles (UNC, Greensboro), Ryan Byerly (Far Western Anthropological Research Group) and Chris Nicholson (Center for Digital Antiquity, Arizona State University)**  
**[170]**

*“Have You Ever Seen a Walrus in Nebraska?” Reflections on the Career and Contributions of Larry Todd*  
 This presentation presents several case studies that highlight the contributions that Larry Todd has made to the study of human paleoecology.

Ehlers, Lisa [2] see MacDonald, Brandi

**Eichner, Katrina (University of Idaho)**  
**[217]**

*Community Caretaking, Collective Parenting, and Othermothering: Diasporic Family Building in the Western American Military*

Using materials and archives associated with Black US Army laundresses stationed at Fort Davis, Texas, in the 1860s–1890s, this paper will investigate how the practice of parenting intersected with a broader focus on public caretaking in the African American community. Adoption, communal parenting, and seasonal fostering were utilized by Black families living in the American West as a means of forming kinship and community ties across military rank, bloodlines, and geographic divides. When considered in the context of Reconstruction-era racial uplift movements, early Black suffragist politics, and the trauma of Jim Crow legislation, collective parenting might best be understood as a performance of new kinds of citizenship, revolutionary love, economic independence, and bodily autonomy denied members of an artificially displaced Black military population.

Eichner, Katrina [98] see Warner, Mark

Eisentraut, Phyllisa [160] see Sanders, Mark

**Ek, Jerald (Western Washington University)**  
**[204]**

*Discussant*

**[204]**

*Chair*

**Ek, Jerald (Western Washington University)**  
**[204]**

*A Tale of Two Types of Cities: The Rise and Decline of Low-Density Urbanism in Champotón, Campeche*  
 Over his distinguished career William Folan made a substantive contribution to knowledge of the scale, form, and nature of Maya urbanism. Classic Maya cities are often classified as a low-density agrarian-based urban

tradition, a cross-cultural concept characterized by expansive settlement zones, lack of urban/rural zonation, and a tendency for long-term demographic collapse. There has been less attention to variability within Maya urbanism. This paper examines diachronic change in the Río Champotón drainage, where regional occupational continuity from the Formative through colonial eras provides an ideal setting to examine multiple episodes of urbanization. During the Preclassic and Classic periods the region was integrated into political and economic networks centered in the interior Maya Lowlands, with a network of low-density cities extending along the Río Champotón from the Edzná Valley to the Gulf Coast. As inland kingdoms fell into decline and long-term demographic collapse, flourishing communities in Champotón reoriented to the coast and the emergent political, economic, and ecological realities of the Postclassic period. The Classic to Postclassic transition witnessed the decline of low-density cities and the formation of a distinctive nucleated urban tradition. Dynamics in the Champotón region provide important insights into broader transformations taking place across the Maya Lowlands.

**Eklund, Emily**

[244]

*Monuments in Bronze Age Mongolian Kinscapes*

Tim Ingold's (1993) work "The Temporality of the Landscape" introduced us to the concept of taskscapes, in which an array of tasks, overlapping and interlocking, work to create a specific place in the larger landscape. I am now introducing another innovative "scape," one used increasingly by Indigenous scholars as a lens through which to understand an array of past and present, overlapping and interlocking, relationships between humans but also nonhumans. Kinscapes, as described by Métis scholar Brenda Macdougall (2017), are networks of relations that work to connect communities to specific places across time and space. The Late Bronze Age in Mongolia was a dynamic period in prehistory, often characterized by the emergence of stone monuments across the landscape. Constructed and used by small, dispersed mobile pastoralist groups, the function of these prominent structures has been actively debated. Previous research has led some to suggest that these cultural markers indicated the rise of elites, while others argue they represent the integration of communities. Through an application of kinscapes to these monuments, we work to gain a new perspective regarding their function, in which communities and monuments are in relational dialogue—each helping the other construct the social landscapes surrounding them.

**Ellick, Carol (Archaeological and Cultural Education Consultants)**

[153]

*Chair*

**Ellick, Carol (Archaeological and Cultural Education Consultants)**

[153]

*Field School on the Road: An Archaeological Experience without a Site*

Hokkaido University's Center for Ainu and Indigenous Studies sponsors an annual International Archaeological Field School on Rebun Island. The site, spanning epi-Jomon to historic Ainu periods, sits on a sandbar that has over time cut off a freshwater source to the Sea of Japan, creating an ideal occupation area. The summer program was to resume in 2022 following the peak of the COVID-19 pandemic. Unfortunately, due to continued concerns about health-related issues, the excavation was canceled. But what do you do with the students from the UK, Canada, Russia, Taiwan, and the United States who signed up for the class?! How do you provide a phenomenal archaeological experience without a site to work on? The answer was to take to the road and introduce the archaeological phases represented in the Rebun Island Hamanaka sites through museums, site visits, and visits to Ainu communities; to learn about the devastation to traditional cultural landscapes due to dam construction and water fluctuation; to absorb the importance of community-based and Indigenous archaeological practice; and to tie it all together through the archaeological investigative process.

Elliott, Marina [205] see Watson, Keli

Elliott, Sarah [20] see Maezumi, S. Yoshi

Elliott Smith, Emma [71] see Bruck, Seth

**Ellis, Grace (Colorado State University)**

**[228]**

*Modeling Pan-Regional Interaction in Precolumbian Lowland Americas*

Archaeologists have speculated for decades that interregional interaction occurred among precolumbian societies occupying the regions of Amazonia, the Caribbean, Mesoamerica, and the southeastern United States. Yet no formal investigation has been done into how these people and places were physically integrated across water. This paper seeks to explore interregional interaction among precolumbian societies occupying these regions and model the potential aquatic transportation routes that were used by inhabitants in the past to facilitate and enable social contact. Aquatic transportation routes will be modeled from known locations, as well as predictive landscape and waterscape features that influence navigation over water. This research will contribute to our understanding of human interregional interaction among lowland precolumbian societies who occupied coastal and riverine regions. By adopting a pan-regional perspective, I attempt to highlight the multiscale nature of cultural interactions in the past and reveal how communities who are dissected by water and practice varying forms of sociopolitical organization maintain important relationships across long distances and over long periods of time. Additionally, this investigation will reveal the possible aquatic transportation routes used by precolumbian societies to facilitate interaction over centuries, demonstrating that pan-regional interaction was not only possible, but likely occurred in the past.

Ellis, Grace [47] see Carvalho, Milena

Ellis, Gwynn [209] see Voggeser, Shannon

**Ellis, Olivia (University of Pittsburgh), John Walden (Harvard University), Kyle Shaw-Müller (University of Toronto), Claire Ebert (University of Pittsburgh) and Julie Hoggarth (Baylor University)**

**[101]**

*Understanding Diachronic Patterns of Feasting at the Late Classic Maya Polity of Lower Dover, Belize*

Traditional anthropological perspectives depict feasting events as a way of promoting social cohesion, as well as reinforcing inequalities. As described by Spanish observers, Postclassic and Colonial (~AD 1280–1600) Maya elites hosted elaborate feasts to reward their followers' loyalty. Similar events are shown on polychrome pottery, depicting Classic Maya kings and their aristocratic entourage consuming tamales, meat, and chicha from decorated vessels. Though feasts are notoriously difficult to identify archaeologically, careful quantitative and context-specific analysis of consumption patterns at the regional level can reveal the existence of feasting and its social and political significance. Using over 80 years of excavation data from the Late Classic (AD 600–900) Maya polity of Lower Dover, Belize, this study analyzes the proportions and distribution of faunal remains and vessels forms (serving vs. storage vs. cooking) from over 96 household contexts. Results revealed significantly higher proportions of serving vessels in intermediate elite and high-status commoner contexts than in low-status commoner households. We propose patterns in faunal and ceramic assemblages allude to the differences in feasting capacity for higher-status and lower-status households, and support patterns of elite-hosted feasting as depicted in Classic, Postclassic, and Colonial periods.

Ellis, Olivia [165] see Walden, John

**Elvidge, Michael (University of British Columbia, Okanagan), Megan Harris (University of British Columbia) and Jeff Wilson (Ursus Heritage Consulting Limited)**  
**[101]**

*Gender Inequality in British Columbia's Heritage Sector: Results from the British Columbia Association of Professional Archaeologists 2021 Wage Survey*

This study argues that gender equity in archaeology promotes an emotionally, financially, and intellectually supported workforce, which in turn, can strengthen the overall quality of commercial archaeology. In 2021, the British Columbia Association of Professional Archaeologists conducted a survey of heritage professionals to investigate remuneration in the sector and to better understand gender-based inequities. We found that cis-females comprise 59.4% of the workforce in British Columbia and form the majority of workers in all professional roles. Yet, on average, they earn 8.54% less than cis-males in similar roles. The majority of cis-male respondents (69%) report occupying decision-making positions compared to 50% of cis-female respondents. Most cis-female respondents (73%) indicate low wages, limited mentoring, and minimal professional advancement as key factors in their overall employment satisfaction, thus limiting equitability and diversity in the sector. We argue that the commercial sector maintains a “boys club” culture that enables homogeneity in perspectives and promotes cis-male employees in archaeological research and practice. Without deliberate intervention, this situation mutes non-cis-male voices and can result in frustration, burnout, and the rapid departure of skilled labor. Departure of non-cis-male voices can further diminish diversity in archaeology and can perpetuate an imbalanced state-of-affairs in this sector.

Emery, Kitty [218] see Boileau, Arianne

Emery, Kitty [84] see Duffy, Lisa

Emery, Kitty [114] see Rose, Autumn

En Pan, Shyong [114] see Desjardins, Sean

**Enderova, Elena (National Museum of History)**  
**[33]**

*The Meaning of a Sample of Teeth Pendants from the Paleolithic Bacho Kiro Cave in Bulgaria (Exc. 1971–1975)*

Bone artifacts from the past are indicators of increased diversity in human behavior and culture. Determining the bone tool type can provide information about past technology, cultural provenience, symbolic expressions, and the type of exploited fauna that inhabited different geographical regions. This presentation will focus on a sample of unpublished teeth pendants found in Bacho Kiro Cave in Bulgaria in the 1970s excavations. They were found at the base of the Upper Paleolithic sequence in layer I (ex layer II) attributed to the regional Initial Upper Paleolithic. In the light of the new discoveries (2016–2021) published recently, an attempt to reassess the 1970s pendants within the technological and cultural variability will be done. Upon the use-wear analysis, characteristic marks, inferred functionality, and preference for animal species some conclusions concerning the production methods will be done. Additionally, some concepts about the meaning behind this variability would require finding greater quantity of such record from across the western Eurasia, but our data allows a preliminary discussion about the relation of this variability with the raw material (animal species), style, and function.

Endonino, Jon [148] see Bonzani, Renee

Engbring, Laurel [175] see Hill, Brittany

**Engelbert, Lynne****[174]***Multidisciplinary Recovery of Previously Cremated Remains after Urban Wildfires*

A firestorm in Northern California in October 2017 brought with it the beginning of a new field in archaeology. This arose following the detection and recovery of cremated remains of previously deceased loved ones kept within the home that were left behind as family members fled for their lives. Locating these cremains saves their living relatives the emotional devastation of knowing the cremains would end up in a toxic dump if not found. The Institute for Canine Forensics, using specially trained dogs, discovered that they could locate cremains within burned-out structures. In 2020, key archaeologists and dog handlers created the Alta Heritage Foundation, a 501(c)(3) nonprofit. To date, ICF and AHF have worked on over 300 home sites, recovering over 450 sets of lost cremains (small amounts to full sets). This was accomplished while bringing solace to countless families and at no cost to these victims of massive wildfires. This presentation tells of how combining archaeology and the ability of the dogs' noses can be used to help those affected by natural disasters.

Engelbert, Lynne [174] see Morris, Adela

**Englehardt, Joshua (Colegio de Michoacán) and Michael Carrasco (Florida State University)****[80]***Envisioning the Iconographic and Epigraphic Corpus of Cerro de las Mesas*

In this paper, we honor John Justeson's contributions to the study of Mesoamerican writing and symbolic systems by revisiting the Epi-Olmec corpus of Classic period Cerro de las Mesas (300–900 CE). Four of the stelae from this site contain examples of the Epi-Olmec script, and their accompanying iconographic programs make these monuments distinct from other objects on which this script has been found, situating the visual culture of Cerro de las Mesas between the earlier Olmec horizon and the later Classic Veracruz culture. In this paper we report on new imaging work performed at the Museo de Antropología de Xalapa in 2022 at John's behest. Three-dimensional photogrammetric models created from these efforts have brought out greater iconographic and epigraphic details, which allow for more accurate drawings. We then discuss the Cerro de las Mesas corpus in light of both these results and previous research, including John's 2005 photographic documentation project with Jorge Pérez de Lara and his seminal collaborative publications with Terry Kaufman on the Epi-Olmec writing system. We conclude with some observations on Epi-Olmec iconography and script as revealed via this work, as well as thoughts for future investigation.

Englehardt, Joshua [80] see Carrasco, Michael

Epimakhov, Andrei [244] see Schmaus, Tekla

Eppich, Keith [242] see Navarro-Farr, Olivia

**Erauw, Céline (Université libre de Bruxelles), Sylvie Byl (Université libre de Bruxelles) and Peter Eeckhout (Université libre de Bruxelles)****[203]***The Biggest Party of All? Zooarchaeological Analysis of an Oversized Late Inca Banquet at Pachacamac*

Pachacamac is a major archaeological site on the central coast of Peru, occupied from the fifth to the sixteenth centuries, AD. This paper reports the results of an interdisciplinary study of a late Inca context discovered in building B4, excavated in 2016 and 2018 by the Ychsma Project (ULB). A series of analyses were conducted, including zooarchaeological ones, which are the focus of this paper. The amount of butchered faunal remains uncovered in one of the excavated areas stands out as evidence of an enormous banquet. Zooarchaeological analysis allowed us to estimate the size of the feast and the number of people involved, as well as document further related material evidence. Furthermore, we discuss the criteria and

limitations for identifying such events in the archaeological record, and the possible motivations for this uncommonly oversized case at Pachacamac.

**Erb-Satullo, Nathaniel (Cranfield University)**

**[166]**

*Reassessing Evidence for Early Iron Production in the Near East*

Work by David Killick and colleagues has documented rich landscapes of iron production sites in sub-Saharan Africa. By contrast, iron smelting and smithing sites have proven far more elusive in the Caucasus and the rest of the Near East. This situation has severely hampered our understanding of iron metallurgy in the areas where it first originated. The picture has improved in the last 20 years, particularly regarding certain stages of production (e.g., smithing) in certain geographic areas (e.g., the southern Levant). Nonetheless, direct evidence of iron smelting in the Near East remains surprisingly spotty, not only for the Early Iron Age but also for subsequent eras. Focusing on the Caucasus, this paper reviews the impact of recent research on prior assessments of iron metallurgical innovation and presents new data on Late Bronze and Early Iron Age metallurgical sites in Georgia and Armenia. The results underline the importance of caution in evaluating claims of iron metallurgical debris in the literature, and the value of reanalyzing material from previously excavated sites. This research provides insights into the social and economic contexts of iron working, while also bringing persistent knowledge gaps into sharper focus.

Erdman, Katherine [181] see Coil, Reed

**Eren, Metin (Kent State University)**

**[88]**

*Discussant*

**Eren, Metin (Kent State University), Grace Conrad (Ohio State University), Stephen Lycett (University at Buffalo) and Michelle Bebbler (Kent State University)**

**[219]**

*A Morphometric Comparison of Copper versus Stone Weapon Tips from the Old Copper Culture*

The Old Copper Culture in the western North American Great Lakes region is one of the few areas in the world in which people produced both copper and stone weapon tips. However, a robust quantitative comparison of these implements has, to our knowledge, never been conducted. Here, we present an analysis of 96 stone and 93 copper weapon tips that includes over 30 morphometric variables. The results of this analysis have implications for the function of stone- and copper-tipped implements as well as the cultural evolution of weapon components made from different materials.

Eren, Metin [219] see Samuels, Amanda

Eren, Metin [219] see Wolff, Christopher

**Erickson, Clark (University of Pennsylvania)**

**[110]**

*Discussant*

Erlandson, Jon [113] see Braje, Todd

**Erlat, Ece**

**[124]**

*Collaborative Indigenous Archaeology in Turkey: The Sardis Case*

Since the early 1900s, the archaeological site of Sardis has attracted Classical archaeologists. However, archaeologists' interaction with the local population has always been limited to labor and domestic service

exchange. Such a relationship reflects colonial origins of archaeology in the Middle East and doesn't address the knowledge-based needs of the young population. The research aim was to adapt Indigenous collaborative archaeology to Turkey to decolonize local-archaeologist relationships, enabling local youth to co-produce knowledge for Sardis. In April 2021–February 2022, I collaborated with sixth-grade students and the social science teacher of Bahçeşehir Middle School. We designed nine informational panels for the 8–12-year-old visitors of Sardis. During the design process, we conducted regular Zoom class sessions (1) for students to share their ideas and curiosities and (2) provide feedback on draft and finalized panels. The results showed that Indigenous collaborative methodologies have great potential in Turkey. Students' interest for archaeology has increased while teachers found an opportunity to promote heritage stewardship among students. Students expressed their willingness to continue the partnership by designing QR-code-based phone applications. Involving local schools as research partner helps archaeologists diversify their interactions with young generations in line with the global movement toward archaeological ethics.

**Ermigiotti, Paul, Mark Varien (Crow Canyon Archaeological Center), Grant Coffey (Crow Canyon Archaeological Center), Stewart Koyiyumptewa (Hopi Cultural Preservation Office) and Leigh Kuwanwisiwma (Hopi Cultural Preservation Office)**

**[90]**

*The Pueblo Farming Project: Research, Education, and Native American Collaboration*

Maize farming represents a fundamental aspect of Pueblo people's identity. This paper focuses on an experimental farming program conducted as part of the Pueblo Farming Project (PFP). The PFP represents one of Crow Canyon's longest-running projects and one of the center's most important collaborations with American Indian partners. The experimental farming component serves as the centerpiece of the PFP, but the project also develops and delivers educational curricula, publishes research results, and pursues Hopi interests in maize and maize farming. We discuss how Hopi perspectives shaped the PFP, present a brief review of experimental garden projects in the region, then compare the experimental gardens located on Crow Canyon's campus, with a garden located about 50 km north, near Dove Creek, Colorado. This comparison examines how a suite of environmental and ecological factors affects differences in maize yields between these gardens. We evaluate one of the primary Hopi goals for the project: whether Hopi seed and farming techniques would produce yields in an area they view as their ancestral homeland. Finally, we discuss how our results contribute to understanding the depopulation of the central Mesa Verde region at the end of the thirteenth century AD.

**Escalante, Kirsty (Tulane University)**

**[250]**

*Recent Investigations of Maya Archaeological Site Looting in Petén, Guatemala*

Archaeological looting in the Maya area has been an enduring concern for over 60 years. While many individual archaeological projects have worked diligently to record looting within their respective project areas, the recent application of lidar in archaeology facilitates the large-scale study of illicit digging in the forested Maya region for the first time. Using a combination of lidar data from northern Guatemala, field verifications of potential looting incidents, and existing literature and excavation reports, this paper presents the recent investigations of Maya archaeological site looting in the department of Petén in northern Guatemala. Both fieldwork and analyses of lidar surveys from archaeologically unstudied areas in the Petén reveal looting that had not been previously identified, highlighting the pervasive and persistent illicit digging practices within the region. Quantification and geospatial analyses of looting incidents in the Petén further demonstrate the potential of lidar and GIS for estimating the scale of looting across the landscape and identifying potential risk factors for Maya archaeological sites. A regional study of illicit digging therefore provides an understanding of looting patterns that had not been possible with traditional survey techniques.

**Esdale, Julie (Colorado State University, CEMML)**

[15]

Chair

[209]

Discussant

**Esdale, Julie (Colorado State University, CEMML), Ian Buvit (Oregon State University's Pacific Slope Archaeological Laboratory), Lindsay Doyle (SUNY, Binghamton) and Whitney McLaren (Colorado State University, CEMML)**

[15]

*Sixty Years of Research at the Donnelly Ridge Site*

In 1964, F. H. West investigated Donnelly Ridge, subsequently using material from there and a few other interior Alaskan sites to define what he termed the Denali complex. In later years, numerous archaeologists returned to Donnelly Ridge for monitoring and limited testing, but nothing substantial was done to synthesize all the data or report anything new. With potential for a deep age, sites like Donnelly Ridge could provide important clues in developing a framework for early Alaskan prehistory. In August 2022, researchers engaged in more extensive work at the site. Goals of the 2022 fieldwork were to document previous studies, assess the site's age and geological context, and determine the potential benefits of continued research there.

Esdale, Julie [15] see Buvit, Ian

Esdale, Julie [15] see Graf, Kelly

**Eshleman, Sara (University of Texas, Austin), Juan Carlos Fernandez Diaz (University of Houston) and Ben Snider (University of Texas, Austin)**

[54]

*Exploring the Effect of Ancient Landscape Modifications on Current Vegetation Structure in the Rio Bravo Conservation Area, Belize*

Airborne laser scanning (ALS), also referred to as lidar, has enabled archaeologists, geologists, geomorphologists, and many others to identify and map ancient modifications of the landscape under dense forest canopies. The impact of ALS in archaeological settlement research has been profound and, to some, even revolutionary. However, its impact in other archaeological fields or related disciplines has been less marked despite a clear potential. With this research, we aim to explore the effect that ancient Maya landscape modifications have on current ecosystems, particularly as reflected by vegetation and its vertical structure. Employing ALS data in conjunction with ecological field data collected in the Rio Bravo Conservation Management Area in Belize, we test the long-held hypothesis that modern environments are partly attributable to human alterations over thousands of years. Using both lowland and upland areas, we will statistically compare vegetation structure of areas with evidence of Maya landscape modification to other areas that do not show anthropogenic perturbation. Statistical and geospatial analyses will be performed to determine the significance or lack thereof of ancient human influence on modern vegetation structure.

**Espinosa, Alicia (Université Paris I—Panthéon Sorbonne, UMR8096)**

[59]

Chair

**Espinosa, Alicia (Université Paris I—Panthéon Sorbonne, UMR8096)**

[59]

*Castillo Decorated Ceramics as Boundaries Objects: A Reappraisal of the Tradición Norcosteña from Ceramic Technology (North Coast of Peru, Early Intermediate Period)*

On the northern coast of Peru and throughout the Early Intermediate period, the frequent findings of Castillo Decorated effigy vessels in Virú (200 BC–AD 600/700) and Moche (AD 100–800) contexts have led several archaeologists to consider them as a northern coastal tradition. In this sense, these ceramics would have

been produced by a community of potters independent of the elites, who possessed and transmitted their own technical traditions for nearly eight centuries. A recent study of the Virú and Moche ceramic production in the Virú, Moche, Chicama, and Lambayeque valleys allows us to reconsider this hypothesis. The analysis of the operative chain, and in particular the methods and techniques of shaping, reveals that these ceramics were mainly produced using a typical Virú technique, hammering, except for the Uhle Platform in Moche, where in some cases they were produced by hammering, and in others by coiling, a technique used to shape Moche plainwares. We propose here to apply the concept of boundaries objects to interpret the use of two distinct and simultaneous shaping techniques, to give a more dynamic account of the mechanisms that led to the spatial and chronological distribution of Castillo Decorated ceramics.

**Espinosa-Valdor, Adrian**

[63]

*City of Miami's Historic Preservation Challenges: Sea-Level Rise and Coastal Real Estate Trends*

The inevitable rise in sea level has drawn the City of Miami into the focus of many studies aimed at understanding future impacts on coastal cityscapes. Local archaeological organizations and professionals are interested in understanding the impact that climate change will eventually have on the region's archaeological landscape. Miami's most incredible archaeological sites, including the Miami Circle and MET Square, have been discovered along the Biscayne Bay coast and banks of the Miami River, putting them at significant risk. Though climate change is perhaps the greatest challenge to preservation in these vulnerable environments, there are other major challenges which I will describe in this paper through my experience as a City of Miami Historic Preservation Planner and Acting City Archaeologist. These challenges include the surging real estate development trend, with over 30 coastal condo towers built or under construction since 2016; and ordinances and policies that have been reticent to change toward better serving their stated goals. In this paper, I will discuss these issues in greater detail along with possible solutions. This paper also endeavors to share experiences and insights gained at the City of Miami working for the Historic and Environmental Preservation Planning Department.

Estes, Aaron [104] see Badillo, Alex

Estevez, Jorge [135] see Curet, L. Antonio

**Estrada-Belli, Francisco (Tulane University)**

[158]

*Discussant*

**Estrada-Belli, Francisco (Tulane University) and Alexandre Tokovinine (University of Alabama)**

[206]

*Chochkitam: A Classic Maya Kingdom on the Kaanu'l Path to Tikal—An Update*

Chochkitam is a major ceremonial center in northeastern Petén, situated among sites with inscribed monuments such as Xultun, La Honradez, Río Azul in Guatemala, and La Milpa in Belize, giving us a few data points on the shifting political history of the Early and Late Classic periods. Since the discovery in 2021 of a carved frieze with a dedicatory inscription naming the Kaanu'l king K'ahk' Ti' Ch'ich' as overlord of a Chochkitam ruler, we know that the kingdom was an important ally of the Kaanu'l in their advancement through northeastern Petén Tikal, culminating in the decisive war of 562 CE. A small monument salvaged by our project from a looted structure at Chochkitam attested to potential links between the local dynasty and Tikal in the fourth century, well before the arrival of the Kaanu'l. A new burial found in 2022 in the structure associated with this monument (CHK Stela 3) and other new evidence from the site shed new light on the Early Classic history of the local dynasty and on its changing political affiliations, providing important insights on the shifting political hegemonies in the Maya Lowlands at the end of the Early Classic period.

Estrada-Belli, Francisco [127] see Dober, Joseph  
 Estrada-Belli, Francisco [154] see Hannold, Cynthia

Etnier, Mike [71] see Loiselle, Hope

Evans, Daniel [17] see Graham, Elizabeth

Evans, Jenny [211] see Levin, Maureece

**Evans, Susan (Penn State University)**

[125]

*Chair*

**Evans, Susan (Penn State University)**

[125]

*Parallel Lives: Aztec and European Elite Marriage Patterns in the Late Postclassic/Renaissance*

The European conquest of the Aztec Empire was eased by strong parallels in Aztec and European courtly behavior in their respective (and contemporaneous) chronological periods, the Late Postclassic (1430–1521) and Renaissance (various dates, 1300s to about 1600). Elite marital alliance patterns, the comparative status of royal women, and flexible definitions of royal legitimacy were factors affecting palace politics all over Europe as well as in Mexico. Cortes and other Spanish adventurers immediately recognized these similarities and could exploit vulnerable points of Aztec royal family loyalty. This study draws on Tenochca (aka Culhua Mexica) royal histories in comparison with those of the Tudors and Plantagenets of England, the Medicis of Italy, and the Trastámara house of Spain, whose Princess Catherine of Aragon married England's Tudor King Henry VIII in 1509 and was still Queen of England at the time of the fall of the Aztec empire. By then Spain was ruled by her nephew Charles I (Holy Roman Emperor Charles V). The Spanish adventurers were status-seekers aware of how power was won or lost by Europe's various royal houses. Customs of the rulers were as important to them as were their shifting military allegiances, forged through marital alliance.

**Evans-Janke, Leah**

[143]

*How Do We Know What We Know? Tales of Rural Outreach*

In 1999, the Alfred W. Bowers Laboratory of Anthropology kicked off a new public outreach program. Since then, staff members have attended at least 15 annual county fairs, taught students how to dig in a field, cleaned vomit (and other things) off our shoes, led parking lot surveys, thrown atlatis, and run weeklong workshops. From traditional to the fully digital, our staff and dedicated students have tried just about every method of talking to the public.

**Evaschuk, Dana, Keli Watson (Pathfinder Endeavours Ltd) and Mike Robertson (Cheslatta Carrier Nation)**

[127]

*Excavation of a Red Ochre Cache in a Natural Geological Kettle Formation in the Central Interior of British Columbia.*

Excavations of natural geological kettle formations are uncommon in cultural resource management projects in British Columbia. Discovery of a large cache of processed red ochre is even more rare with only one similar ochre cache known to exist on the Canadian Plateau. Ochre is an iron oxide prevalent in the Rainbow Mountain Range, part of the Anahim Volcanic Belt of mountains that were active approximately 10 million years ago. This range is located 60 km south of the cache and is suspected to be the logical source of the

ochre. Weathering, erosion and oxidation of minerals make the mountains colorful with red, yellow and purple hues. This unique discovery is part of a large multicomponent site consisting of at least nine natural kettle formations located on the shore of Tetachuck (Tatichek) Lake, part of a 233 km long hydroelectric reservoir system. In this paper we examine the acquisition, procurement and possible distribution of the ochre with other First Nations as well as the potential cultural uses at this site. We also discuss our excavation and recovery process of the ochre powder from the heavily stained coarse sand in the center of the kettle feature.

Evaschuk, Dana [205] see Watson, Keli

**Everill, Paul (University of Winchester)**

[14]

*Archaeology and Well-Being Delivered through Authentic and Meaningful Participation*

Archaeology, heritage, and the historic environment more broadly are increasingly recognized as powerful tools in the delivery of community mental health and well-being benefits. Archaeology as a therapeutic intervention for veterans achieved significant public profile through the work of Operation Nightingale, 2011. Recently, the edited volume *Archaeology, Heritage, and Wellbeing* (Everill and Burnell 2022) included different perspectives that highlight various ways in which the historic environment can support mental health/well-being among marginalized communities. Recent interdisciplinary research by Everill and colleagues has also led to the production of guidelines, designed to unlock the full therapeutic potential of the historic environment through Authentic and Meaningful Participation in Heritage or Related Activities (AMPHORA), in which participants are contributing fully to projects that, in turn, are able to provide the right support and safeguarding. This conversation will focus on the multiple benefits derived from the University of Winchester's archaeological studentships for wounded veterans, building on potentially short-term well-being uplift of participation in excavations by providing opportunities for long-term skills development and creating life-changing routes into professional practice—consequently not only focused on mental health benefits but also widening participation and access to higher education among individuals who previously felt excluded.

**Evilsizer, Laura (Montana State Historic Preservation Office)**

[143]

*Outreach and Education: Approaches and Strategies from the Montana State Historic Preservation Office*

Having a public that is knowledgeable about, and interested in, archaeology benefits us all. However, achieving that goal requires we learn from each other to better serve our mission and build communities. The Montana State Historic Preservation Office (MT SHPO), which is part of the Montana Historical Society, pursues many different avenues for engaging in public outreach. This includes one-on-one consultations with landowners and collectors, a “footlocker” program that brings artifacts into classrooms and into children's hands, assistance for in-state field schools, and encouraging Section 106 mitigation to prioritize public interpretation options. The limits of the Historic Preservation Fund often mean the MT SHPO needs to be creative in producing nonfinancial ways to assist efforts. This symposium explores the strengths and weaknesses in MT SHPO's approaches and traces some emerging patterns in public involvement.

Faber, Sarah [181] see Blondin, Émilie

Fagan, John [171] see Hlatky, Nicholas

Fagan, John [179] see Mack, Joanne

Fairbanks, Janis [98] see Arnott, Sigrid

**Fairley, Helen (US Geological Survey), Joel Sankey (US Geological Survey) and Joshua Caster (US Geological Survey)****[176]***Assessing Predictability of Dam Effects at Archaeological Sites Using Long-Term Repeat Lidar Surveys*

Repeat lidar surveys conducted over multiple years are a means of monitoring physical changes at archaeological sites with methods that are objective, replicable, accurate, and relatively low impact. These monitoring data can also be useful for testing assumptions about how archaeological site condition may change in response to changes in upstream dam operations and consequent alterations in the downstream environment. Using topographic change data collected with terrestrial lidar over the past decade at 29 sites along the Colorado River in Grand Canyon, Arizona, we assessed predictability of a conceptual model in terms of whether sites are likely to aggrade or degrade in response to ongoing operation of Glen Canyon Dam located upstream from the study area. Initial analysis of the lidar-based monitoring data demonstrates that effects of dam operations on archaeological sites are generally predictable when geomorphic setting, local sediment supply, weather conditions, and dam-induced riparian vegetation expansion are considered. While we developed the conceptual model and monitoring methods as a means of assessing dam effects on downstream archaeological sites, the approach is broadly transferable to other contexts and for other research purposes, such as assessing influences of changing climate on cultural resources

**Falucci, Armando (University of Tübingen) and Diego Lombao (University of Santiago de Compostela)****[21]***Measuring Reduction Intensity in Laminar Cores: An Experimental Approach and Archaeological Application*

Reduction intensity analysis plays a key role in understanding the formation of lithic assemblages and the occupation patterns of Paleolithic sites. Furthermore, technological variability and core classifications can be better understood if the diachronic component of the reduction is taken into consideration. The Volumetric Reconstruction Method (VRM), developed by one of us (DL), has allowed to explore the technological behaviors of hominins in early contexts such as Gran Dolina in Sierra de Atapuerca (Spain). Here, we present a variation of the VRM specifically designed to assess the reduction intensity of laminar cores. In order to test the accuracy of this adaptation, we designed a sequential experiment that consisted in knapping several nodules following the reduction strategies described in the early Upper Paleolithic record. We recorded all stages of the reduction sequence using a 3D-scanner and compared the results obtained through the VRM with other approaches such as the Scar Density Index, the angles between core surfaces or the percentage of non-cortical surfaces. The good inferential potential of the methods allowed us to investigate core reduction intensity in the Protoaurignacian assemblage from Fumane Cave (Italy) to address raw material management strategies and technological behaviors at the onset of the Upper Paleolithic.

**Fallu, Daniel (UiT: The Arctic University Museum of Norway)****[40]***Discussant*

Fang, Xiangming [68] see Tang, Yiyi

**Fang, Yuan (University of Oregon) and Gyoung-Ah Lee****[99]***Interpreting the Diffusion of Bronze Mirrors in Ancient China across Time Using the S-Shaped Curve*

The S-shaped curve in the social network context is a model proposed to reveal dynamic changes over time among members in a network when accepting a new idea/product. The S-shaped curve has been mainly used in social sciences to model the diffusion of objects or ideas using current empirical data. However, it is rarely applied to archaeology because such data in the past is not often available. With caution and recognition of certain assumptions, diffusion theory and models such as the S-shaped curve can be useful to interpret archaeological findings in an innovative social network way. In this study, the S-shaped curve is used to

describe the invention (a few people join initially), the introduction (individuals influence a few others), the spread (the number of adopters rises rapidly), and the acceptance (the growth tapers off) of bronze mirrors across social classes in ancient China from the Neolithic period to the later feudal dynasties (~2000 BCE–~1900 CE). To apply the S-shaped curve, the social strata are used as a proxy for how prevalent bronze mirrors were accepted by the society. This study can help archaeologists better understand ancient Chinese societies through the lens of bronze mirrors.

**Fanthome, Eduard (Stanford University)**

[217]

*Moving in New Ways, Making New Places: Novelty and the Politics of Place Making*

Tracing the movement of people archaeologically is a challenge, especially since the deconstruction of the direct association between people groups and material culture. This paper approaches material culture and spatial practice as the constitution and negotiation of social relations. I argue that understanding “novel” material culture requires an examination of the context in which it is introduced and the modalities of constituting and negotiating social relations it affords. I examine one potentially novel spatial and material practice in a settlement in the Raichur Doab, a frontier space in medieval South India contested by three medieval imperial polities during the period I examine. This novel practice is instantiated in the construction, design, and morphology of an entranceway into a settlement I am studying. Several features of this entranceway indicate processes that historians of medieval South India have interpreted as evidence of the expansion of and integration within imperial polities. Instead, I argue that the entranceway and the spatial logic it instantiates are best understood through the social relations that coalesce around and were negotiated through it. Rather than reducing novel practices to imperial investments, this paper highlights the agency and dynamism of local groups in spatial production.

**Farace, Anthony (University of Florida)**

[86]

*Chair*

**Farace, Anthony (University of Florida)**

[86]

*Ramey on the Frontier: A Pilot Study of Select Ramey Incised Technology from Cahokia's Southern Neighbors*

Cahokia's influence on the archaeological cultures of the upper Central Mississippi River Valley (CMRV) has often been described as less prominent than processes taking place in the northern hinterlands. Although few examples are found at each site, Ramey Incised jars are found in many early and middle Mississippian (AD 1000–1300) occupations in the CMRV, and archaeologists debate the role they played in everyday life and a localized Mississippian identity. This pilot study looks at the ceramic microstructure (ceramic petrography), use-wear, and contextual information of a few Ramey Incised jars from archaeological sites in western Kentucky and across the Mississippi in southeastern Missouri to produce detailed object itineraries. Petrographic results describe production methods used to create the vessels including estimations of base clays, clay mixing, firing environment, and formation methods. Use-wear and other contextual information are used to form inferences about where and how the jars were used at the sampled archaeological sites. The presentation compares these detailed itineraries with utilitarian, local vessels to establish similarities and differences in production and use during the height of Cahokia to the north. The presentation ends by introducing future goals and further research being developed about Mississippianization of Cahokia's southern neighbors.

**Farah, Kirby (Gettysburg College) and Benjamin Luley (Gettysburg College)**

[211]

*Reimagining “Archaeological Field Methods”: Insights on Integrating Campus Excavation, Classroom Instruction, and Critical Discussion*

This paper reflects on an archaeological field methods course designed for Gettysburg College and taught in fall 2021. This course, which we will continue to teach in coming years, represents a new offering at the

college and meets a growing need to train anthropology majors who wish to focus on archaeology as a career. Students enrolled in the course in fall 2021 participated in the excavation of the college's "janitor's house," which was in use from the mid-nineteenth through early twentieth centuries. The excavation provided students with hands-on archaeological experience without having to leave campus or spend money on external field schools. Furthermore, because the course was a semester long and involved intensive course reading, writing assignments, and discussion, students had time and space to critically contextualize our archaeological research within broader histories and in relation to various theoretical frameworks. We will discuss which aspects of the course were successful as well as those that were not, and we will offer guidelines for others interested in designing a similarly integrated methods course for undergraduates.

Farahani, Alan [22] see Martirosyan-Olshansky, Kristine

Farahani, Alan [99] see Ranum, Caleb

Farahani, Alan [43] see Sinensky, R. J.

Farfan Garcia, Angie [237] see Gutierrez, Jonathan

**Fargher, Lane (Centro de Investigación y de Estudios Avanzados del IPN)**  
[60]

*Discussant*

**Fargher, Lane (Centro de Investigación y de Estudios Avanzados del IPN) and Ricardo Antorcha-Pedemonte (Cinvestav del IPN—Unidad Mérida)**  
[8]

*An Archaeogeochemical Perspective on Ancient Maya Land Use and Climate Change: The Case of Lagunas de Yalahau, Yucatan, Mexico*

Recent theoretical advances emerging from Historical Ecology have reoriented thinking regarding human-environment relations in many ancient contexts. Consistent with this research program, the concept of the Maya Forest-Garden introduced by Ford and Nigh and Rivera-Núñez and Fargher's work on Kanan Ka'ax, among others, have provided a more integrated socioecological and indigenous perspective on Maya landscapes. Following on these perspectives, we present the case of Lagunas de Yalahau, located in the central portion of the state of Yucatan. Using archaeological survey and geochemical data ( $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ ,  $\delta^{18}\text{O}$ , macro/micronutrients, etc.) from sediment cores recovered from two cenotes within the site, we evaluate how population growth, environmental management, and climate change shaped Lagunas de Yalahau's landscape during the Late Classic period (especially between  $\approx$  AD 500 and  $\approx$  AD 850). This period saw massive population growth across the Maya area coupled with sociopolitical florescent, processes that Lagunas de Yalahau's inhabitants were caught up in. Specifically, these data are used to evaluate various hypothetical scenarios that postulate alternatively that landscape modification, recorded archaeologically, resulted in ecological degradation vs. enrichment.

Fargher, Lane [247] see Marino, Marc

**Farley, William (Southern Connecticut State University)**  
[40]

*Discussant*

Farley, William [105] see Krupa, Krystiana

Farquhar, Jennifer [54] see Rosen, Arlene

**Farrell, Mary (Trans-Sierran Archaeological Research)****[38]***Discussant***Farrell, Mary (Trans-Sierran Archaeological Research) and Nancy Ukai (Wakasa Memorial Committee)****[160]***Who Owns the Past? The Murder of James Wakasa and His Memorial Stone*

Eighty years ago, James Wakasa was shot and killed while walking his dog in the Utah desert. Wakasa was one of 120,000 Japanese Americans incarcerated during World War II because of their ethnicity; he had been imprisoned at the Topaz Relocation Center and his killer was a Military Police guard. In a finding that would sound all too familiar even today, an official inquiry determined that the killing was a “justifiable military action.” Mr. Wakasa’s fellow incarcerated did not agree: they erected a stone memorial at the spot where he was killed. The military and the camp administration quickly ordered the monument removed. The Japanese American community’s reaction to the recent archaeological discovery that the memorial was still present, although largely buried, exemplifies the power of place and artifacts to express, and ideally to help heal, intergenerational trauma. However, the abrupt removal of the stone by a local museum triggered a new debate: what role should the descendant community play in preserving and interpreting their own history?

Fash, William [176] see Ploetz, Chris

Fash, William [234] see Traxler, Loa

**Faugere, Brigitte (University Paris I) and José Luis Ruvalcaba (UNAM)****[89]***An Agate Basin Point from Michoacán, Mexico*

A complete black obsidian Agate Basin Point was found in a rockshelter in the state of Michoacán, Mexico, during the excavations realized by the CEMCA team. Despite the fact that the stratigraphy of the shelter had been completely disturbed, this point was found associated with a complete blond flint Clovis. The association of these two relevant points indicates a late reuse of these iconic objects. The paper will describe the technical aspects related to the manufacture of the point and the results of the archaeometric analysis of the obsidian, as well as cultural aspects related to this deposit.

**Fauvelle, Mikael (Lund University)****[92]***Chair***Fauvelle, Mikael (Lund University) and Peter Jordan (Lund University)****[92]***The Transformative Power of Boats: Seafaring and Social Complexity in Indigenous California and Hokkaido*

One critical aspect of complex watercraft is their transformative power to amplify the impacts of social connections with distant places by allowing for longer, larger, and more frequent interactions. In many small-scale and indigenous societies, the use of advanced boats allowed for communities to impact regions far beyond their own boundaries, affecting historical trajectories both at home and abroad. This paper compares two different traditions of sewn plank canoe use from opposite sides of the Pacific: coastal California and northern Japan. These case studies are united by striking similarities in the technology used in boat construction as well as the extent and importance of open-ocean travel. In both areas, canoe construction was sponsored by local elites and involved both high-value materials as well as elaborate launching rituals. We argue that the innovation of sewn-plank boat technology in both regions allowed for longer and faster voyages, greatly expanding the ability of local leaders to control and conduct trading and raiding voyages to distant locations. Examining parallels in how complex watercraft in California and Japan contributed to social changes in each region can assist with identifying similar patterns in small-scale maritime societies around the world.

Feathers, James [70] see Lubinski, Patrick

Fedchenko, Amy [18] see Gruber, Anya

**Feder, Kenneth (Central Connecticut State University)**  
**[40]**

*Discussant*

**Fedick, Scott (University of California, Riverside)**  
**[165]**

*Discussant*

Fedick, Scott [129] see Mathews, Jennifer

**Fedoroff, Michael (University of Alabama)**  
**[209]**

*Chair*

**Fedoroff, Michael (University of Alabama)**  
**[209]**

*Building Resilient Cultural Resource Programs with Tribal Partners: A Department of Defense (DoD) Perspective*  
Many challenges exist to keep training and operations on military installations viable over time. Environmental and cultural stewardship programs are part of a military planner's strategic approach to ensuring Department of Defense (DoD) managed lands remain healthy and active use areas for the warfighter. This paper examines the different approaches utilized to build resilient cultural resource programs on DoD-managed land bases with the intent to highlight collaborative approaches to engagement with tribal communities with ties to these land-based places. Several themes are identified that highlight the differences in European notions of "natural" and "cultural" resources and how they are managed. The author contends that by incorporating Indigenous Knowledge Systems into DoD stewardship and preservation practices, better science and relationships are cultivated.

Fehren-Schmitz, Lars [22] see Bongers, Jacob

Fehren-Schmitz, Lars [102] see Broomandkhoshbacht, Nasreen

Feinman, Gary [142] see Thompson, Amy

Feit, Rachel [239] see Ingalls, Victoria

Feliciano, Sofia [17] see Brown, Clifford

Feliú Beltrán, Núria [34] see Vázquez de Ágredos Pascual, María Luisa

Feltz, William [69] see Mullins, Patrick

Fengel, Miranda [196] see Nicolay, Scott

**Fenn, Thomas (University of Oklahoma, Dpt of Anthropology)**

[166]

*Chair*

**Fenn, Thomas (University of Oklahoma), Laure Dussubieux (Field Museum), Shinu Anna Abraham (St. Lawrence University) and Alok Kanungo (IIT Gandhinagar, India)**

[210]

*Ancient and Historic Glass Production in India: Preliminary Results of Raw Material Analyses*

Glass—and particularly the glass bead—was a common commodity of Indian Ocean trade, beginning as early as the mid-first millennium BCE and continuing through the second millennium CE. While existing elemental and isotopic analyses of glass beads recovered from outside India have identified glass production recipes likely from India and South Asia, little else is known about the potential production sources within these regions. An NSF-supported project designed to explore ancient glass production in India has completed a second year of fieldwork, and preliminary results of elemental and isotopic analyses aimed at characterizing glass raw materials from India are now available. The foci of research in India were sampling glass raw materials (e.g., sand, reh [alkali source], etc.) from regions of known and presumed historic and ancient glass production. To this end, dozens of potential raw material loci have been sampled in five main regions of India (Tamil Nadu/Pondicherry, Andhra Pradesh, Maharashtra, Gujarat, and Uttar Pradesh), and those materials have been or will be subjected to elemental and isotopic analyses. While not all raw material samples are clear matches with ancient glass recipes, preliminary elemental and isotopic results show connections to glasses from within and beyond India.

Fenn, Thomas [210] see Abraham, Shinu Anna

Fenn, Thomas [166] see Brewer-Jensen, Ella

Fenomanana, Felicia [133] see Buffa, Danielle

**Ferar, Nolan (ICArEHB, University of Algarve, Faro, Portugal), Claudio Tennie (Universität Tübingen), Mark Moore (University of New England), Alexandros Karakostis (Universität Tübingen) and Elena Moos (Universität Tübingen)**

[232]

*Spontaneous Ability to Impose Form by Knapping-Naïve Humans*

Human culture's unique complexity depends upon the ability to faithfully transmit know-how over generations. Given other primates do not exhibit a similar capacity, when hominins began to transmit know-how between one another is a key question for human evolution. In the archaeological record, the reoccurrence of stone artifact forms is often taken as evidence that these forms and/or their underlying production techniques were culturally transmitted—in both cases, know-how copying is assumed. However, the key premise that learning to impose these forms requires cultural transmission of know-how remains an untested assumption. We tested whether the generalized ability to impose form requires cultural transmission using a novel puppet knapper experiment. Individuals naïve to stone knapping (the “puppeteers”) attempted to impose 12 target forms onto glass blanks by directing an expert knapper (the “puppet”) what to do. The results of two independent sorting tasks and geometric morphometric analyses demonstrate the puppeteers successfully imposed various target forms via the puppet. These findings suggest that the ability to impose form by knapping may not be dependent on knapping experience per se, nor require cultural transmission. If true, imposed artifact forms would not necessarily constitute “smoking gun” evidence for the beginnings of cumulative culture.

**Ferguson, Jeffrey (University of Missouri), Timothy de Smet (Binghamton University), Jonathan Schaefer (Tetra Tech), Deborah Huntley (Tetra Tech) and Suzanne Eckert (University of Arizona)**

[176]

*Testing the Potential of UAV-Based Lidar Survey in the Lion Mountain Area of West Central New Mexico*

The use of lidar as a survey tool has revealed vast areas of past human activity in parts of the world with dense vegetative cover. However, its applications have not been explored to the same degree in areas with less vegetation and good surface visibility, such as that of the American Southwest. Ongoing research for the Lion Mountain Archaeology Project has sought, in part, to understand Ancestral Pueblo activity within a roughly 12-square-mile area of the Gallinas Mountains in west-central New Mexico. We report on initial tests to use drone-based lidar to survey areas previously subjected to intensive pedestrian survey to determine the limits of site detection using this remote sensing method. Ancestral Pueblo habitation and ceremonial sites in the region frequently exhibit visible surface features such as rock alignments, rubble mounds, depressions, and/or standing architecture. If it is possible to reliably identify larger habitation and ceremonial sites using remote sensing methods, future survey in the study area and surrounding regions may be expedited. If proven a viable method, future tests could involve lidar survey of previously unsurveyed areas followed by ground-truthing via pedestrian survey.

Ferguson, Jeffrey [48] see Schollmeyer, Karen

**Fernandez, Rachel (Center for Digital Antiquity / tDAR)**

[75]

*Making Data Free, Immediate, and Having Equitable Access: How Federal and State Agencies Work to Meet OSTP Governance through Responsible Curation and Preservation*

With the call from the Office of Science and Technology Policy (OSTP) to make federally-funded research openly and immediately available, many archaeologists, archivists, and CRM professionals in the US are left wondering how this affects their research and ability to preserve and protect their data. Most affected by this governance are state and federal agencies that are tasked with improving their current preservation and access policies by next year. Looking at three different agencies and their digital collections, this poster details varied workflows undertaken to make collections more accessible. Whether for public outreach or organizational purposes, depositing in a responsible repository such as tDAR (the Digital Archaeological Record), these agencies are able to fulfill this call for accessibility, protection of sensitive information, and preservation. Included in the poster is a summary of “best practices” for agencies to follow to ensure that this new directive is implemented and make their archaeological data available and responsibly curated.

Fernandez, Rachel [124] see Collazzi, Charlene

Fernández-Céspedes, Glenn [239] see Hurst, Stance

Fernandez Diaz, Juan Carlos [54] see Eshleman, Sara

Fernandini, Francesca [176] see De La Puente-León, Gabriela

Fernandini, Francesca [29] see González Gómez de Agüero, Adrián

**Ferree, Tyler (University of California, Santa Barbara), Gregory Wilson (University of California, Santa Barbara) and Amber VanDerwarker (University of California, Santa Barbara)**

[213]

*War, Power, and History in the Mississippian Period Central Illinois Valley*

This paper considers the impact of warfare-induced settlement nucleation on the sociopolitical organization of the thirteenth-century Central Illinois River Valley. Concurrent with the beginning of a period of intense

warfare, Mississippian groups in the region abandoned their small, dispersed farmsteads and aggregated into the region's first nucleated villages. Cross-cultural analyses of aggregated settlements have shown that groups are often ranked by their order of arrival into the community. This case study is novel in that newcomers to these nucleated settlements were quickly incorporated with little evidence of inequality between social groups. Indeed, the archaeological evidence we discuss in this paper suggests that the founders of the CIRV's first nucleated villages substantially expanded upon previously established Mississippian traditions of group decision-making by constructing much larger council houses. These new ceremonial spaces emphasized group solidarity rather than chiefly authority and allowed for the inclusion of more social groups in decision-making.

**Fertelmes, Craig (Logan Simpson) and Bruce Phillips (BGP Consulting)**  
[179]

*Middle Archaic Period Settlement Patterns and Subsistence Strategies in the Lower Salt River Valley of Arizona*  
Archaic period sites are rare in the lower Salt River Valley of south-central Arizona. Logan Simpson Design recently identified two middle Archaic period sites on the Holocene floodplain of the Salt River. Evidence suggests that the two sites were short-term riparian resource procurement and processing locales that were protected from flooding (and subsequent erosion) by a natural levy or hillocks. Previously documented Middle Archaic period sites located in upland settings away from the Salt River include seasonally occupied residential bases and special-purpose field camps. Based on this settlement patterning, the subsistence strategy of Middle Archaic peoples in the lower Salt River Valley is inferred to have been characterized by logistical mobility with focal sites in upland settings and task-oriented sites in riverine or preferred hunting locales.

Ferwerda, Carolin [177] see Alperstein, Jonathan  
Ferwerda, Carolin [55] see Casana, Jesse  
Ferwerda, Carolin [69] see Graves, Michael  
Ferwerda, Carolin [111] see McLeester, Madeleine

**Festa, Marcella (Northwest University, Xi'an)**  
[67]

*Preliminary Faunal Analysis of Yishengci, Nanyang, Henan Province*  
Yishengci is located in the southeastern corner of the ancient Wancheng city (Nanyang, Henan Province), which is at present one of the most important urban sites of the Han dynasty (ca. 202 BC–AD 9). In spring and summer 2021 four trash pits were excavated, uncovering, among other finds, a significant number of animal bones. We present a preliminary analysis of the faunal remains uncovered during these excavations. Pigs were the most commonly identified specimens, whereas additional identified taxa include large and medium bovines (cattle and sheep), canids, horse, cervids, small rodents, and birds. Other notable finds include a group of worked elements, including bone hairpins and decorative items made of pig teeth. Our analysis makes an important contribution to the limited zooarchaeological data for this period and allows a concrete insight into the subsistence strategies of the urban Han population, which has so far been mostly understood through written sources.

Ficke, Cash [95] see Stokes, Robert

Field, Sean [176] see Reese, Kelsey

Fierer-Donaldson, Molly [135] see Shoup, Daniel

**Figueroa, Alejandro (University of Missouri)****[5]***Discussant***Figueroa, Cristian (University of California, Berkeley), Jean-Paul Rojas (Franklin & Marshall College), Zindy Cruz (University of North Carolina, Charlotte) and Guy Duke (University of Texas, Rio Grande Valley)****[237]***Social and Physical Landscape Changes at Buen Suceso*

Four seasons of excavation at the Valdivia site of Buen Suceso allow for a preliminary reconstruction of an occupational history of the site. Areas with likely ritual significance point to social changes at the site that demonstrate the unique nature of the Buen Suceso community. This paper situates the Buen Suceso site within its local landscape and explores the connection between spatial and social change by focusing on two areas of the site identified as the central plaza and the mound referred to as Unit 6. We analyze changing practices at these two locations to discuss their relationship to social change at Buen Suceso, and their significance in light of social changes at other Valdivia sites.

Figueroa, Cristian [237] see Gutierrez, Jonathan

Figueroa, Leonardo [102] see Arriaza, Bernardo

**Figueroa Beltran, Carlos (Center for Latin American Studies-San Diego State University) and Nicole Mathwich (San Diego State University)****[82]***Seasonal Resource in Coastal Baja California: Pedestrian Survey in Colonet, Baja California, Mexico*

The Colonet region is located in northwestern Baja California, Mexico, and due to its geographic isolation and slow economic development, archaeological evidence of the prehistoric Yuman groups has been preserved for millennia. The region offers a unique research opportunity to examine the occupational sequence of late prehistoric people and the resource use and adaptation to the local environment and aridity of the Pacific coastal deserts. We present the results of our pedestrian survey work conducted in June 2022, which focused on systematic data collection on size variation, site location and density, and tool production and activity. The survey results in Colonet point to the surprising density of shell middens and secondary agave processing activities. The survey confirmed that seasonal shellfish collection and processing were the primary activities drawing people to the area, as noted in previous vehicular surveys. The inland locations, presence of agave knives, expedient tool manufacturing, and fire-affected rock suggest sites were selected based on more considerations than their proximity to coastal shell collection sites. The pedestrian survey's focus on late prehistoric seasonal camps offers a valuable point of comparison to late prehistoric resource use and rise of social complexity in northern Baja Californian and Alta California.

Filimoehala, Christopher [207] see Filimoehala, Darby

**Filimoehala, Darby (International Archaeological Research Institute Inc.) and Christopher Filimoehala (International Archaeological Research Institute)****[207]***Ethnoarchaeological Contributions to Interpreting Pacific Archaeofish Assemblages*

In 1976, Tom Dye conducted an ethnographic study of marine resource exploitation on Niuatoputapu, Kingdom of Tonga, to help provide a reference from which to interpret prehistoric patterns evident in the archaeological remains. Ethnoarchaeology provides a point of control for an expanded comparative

framework through which analytical interpretations of the archaeological record can be formulated and examined. In this paper, we consider Dye's contributions to Pacific ethnoarchaeological research, and his methodological advances to fish studies in Hawai'i through the creation of an ichthyology manual. A case study from Hawai'i demonstrates the value of such ethnographic work and the base of information that they generate. Many traditions and historical records describe coastal Ka'ūpūlehu as renowned for its rich fishing grounds. These records indicate that the heads of certain species of goatfish, mullet, and surgeonfish were tossed back to avoid strange occurrences or nightmares from their consumption. The possibility of butchery affecting element representation was examined in an archaeofish assemblage from Ka'ūpūlehu by comparing the survivorship of cranial bones to vertebrae to determine if underrepresentation may be due to offsite head removal.

Filimoehala, Darby [207] see Tuggle, Myra Jean

**Filoromo, Steve (Temple University), Paul Jackson (TerraXplorations Inc.) and Kenny Pearce (TerraXplorations Inc.)**

[6]

*Personal Practice: Adornment and Personal Goods from the St. Amelia Plantation (16Sj80), St. James Parish, Louisiana*

The material traces of those within certain spaces, such as the "Big Houses" of southern Louisiana's plantations, are not restricted to the wealthy. Enslaved peoples, wage-laborers, and many others labored throughout the home. Here we utilize personal artifacts from Phase III data recovery excavations at the St. Amelia Plantation main house (16Sj80), in St. James Parish, Louisiana. Through an analysis of these personal goods, we integrate historical research to better understand the diversity and movement of people, enslaved, emancipated, and those among the family, within the house. We further contextualize and compare the presence of glass adornment items to similar historical archaeological sites within southern Louisiana. Drawing from ethnohistorical and archaeological data, it is possible to evaluate personal practices, from prayer to play, and personal adornment to politics, to better understand the many people who lived and worked throughout the plantation.

**Finley, Judson (Utah State University), Erick Robinson (Boise State University), R. Justin DeRose (Utah State University), James Allison (Brigham Young University) and Matthew Bekker (Brigham Yung University)**

[198]

*High-Precision AMS Radiocarbon Chronologies Demonstrate Short-Lived Agricultural Village Occupations on the Northern Colorado Plateau*

The Fremont archaeological complex provides an important window into the socioecological dynamics underwriting the formation of settled pithouse communities in the western North America drylands. We developed high-precision AMS radiocarbon chronologies based on short-lived annuals for four Fremont sites (Cub Creek, Caldwell Village, Steinaker Basin, and Snake Rock), which we paired with high-resolution precipitation reconstructions using tree-ring widths. While Fremont occupations north of the Colorado River span the period AD 300–1300, pithouse communities formed between AD 840 and 1240. We test the hypothesis that multidecadal precipitation variability is directly related to the duration of village occupations where longer spans correspond to lower variability and shorter spans correspond to higher variability. Variable hydroclimate also impacts stream geomorphology and arable area. This study implicates hydroclimate as one important constraint on the sustainability and growth potential of early dryland agricultural systems at the northern margins of maize agriculture in the American Southwest.

Finley, Judson [198] see Cheney, Chelsea

Finley, Judson [198] see Harvey, David

Finley, Judson [198] see Wolberg, Alexandra

**Finn, Jennifer (Utah State University) and Jacob Freeman (Utah State University)****[198]***Agriculture, Group Size, and Resource Richness*

This poster presents data on the area, group size, and prey/plant richness of agricultural and pastoral societies. We test the hypotheses that (1) the richness of prey harvested by human groups correlates with the well-known species richness-latitude gradient; (2) that as groups increase their commitment to agriculture, they increase the richness of prey harvested; and (3) that as a group's population size and area increases, the richness of harvested prey also increases. We examine potential feedback between group size, area, and prey species richness, and we discuss implications for understanding the formation and persistence of agricultural communities in the archaeological record.

Finney, Bruce [15] see Potter, Ben

**Firenzi, Alexandria, Summer Hagerty (University of Nevada, Reno), Charlie Goggin (Humboldt Toiyabe National Forest) and Christopher Jazwa (University of Nevada, Reno)****[122]***Dietary Variation, Population Aggregation, and Foraging Strategies on Santa Rosa Island during the Medieval Climatic Anomaly*

We examine dietary change on northern Santa Rosa Island, California, at the mouth of Cañada Verde, the location of the historically documented village of Silimihi, the third-largest village on the island by baptisms. There is evidence of a human presence at this location from the middle Holocene (4560–4140 95% cal BP) through the period of Spanish contact. Early occupation is at CA-SRI-41 to the west of the drainage mouth, before moving to CA-SRI-40 and -502 to the east after the Medieval Climatic Anomaly (1150–600 cal BP). Dietary diversity and faunal density increase through time, including fish and sea mammal bone. We compare the faunal record at these sites to that from CA-SRI-97 (Nawani), the smallest village site on the island, located along the southwest coast at the mouth of Acapulco Canyon. While both sites include a high diversity and density of fish bone and shellfish, both are higher at the larger village site of Silimihi. These findings are consistent with ecological models that indicate the north coast was wetter providing greater marine productivity. Results of this analysis provide important information about the context of population aggregation to villages among coastal hunter-gatherers and how it may differ between habitats.

Fishburn, Eleanor [181] see Holguin, Brian

Fishburn, Eleanor [99] see Sunell, Scott

**Fisher, Abigail (Southern Methodist University) and Kelsey Witt (Center for Computational and Molecular Biology)****[245]***Dog Diet Reconstruction as a Tool to Assess Forager Response to Introduction of Agriculture in the Northern Plains: Stable Isotope Analysis and Ancient DNA Data*

The transition to agriculture in the Great Plains of North America is generally assumed to have occurred through processes of migration and diffusion. But understanding the nuance of this transition at local and subregional scales requires a focus on different types of social interactions and community-level decision-making. One method is to use dogs (*Canis familiaris*) as a proxy for human behavior. Domesticated canids were an important resource for Plains people; used for traction, food, security, and ritual. Given their ubiquity, as well as their tendency to consume human waste and garbage, dogs can provide information about human diet and lifeways. By combining traditional zooarchaeological, geometric morphometrics, ancient DNA, and stable isotope analyses of dog teeth and mandibles from North and South Dakota, this research focuses on Late Woodland indigenous group responses the introduction of agriculture in North Dakota by reconstructing dog diet through time.

**Fisher, Chelsea (Washington and Lee University)****[108]***Discussant*

Fisher, Jacob [150] see Bailey, Caitlyn

**Fisher, Philip (FEMA)****[194]***Discussant***Fitzgerald, Kat (Aventura Archaeology Project, PaleoWest LLC), Kacey Grauer (Stanford University), Zachary Nissen (Northwestern University) and Cynthia Robin (Northwestern University)****[243]***A Human Geography of Aventura: Lidar and Settlement Survey*

A human geography perspective provides our broadest lens to envision the entwined relationships of people, communities, and environments at Aventura. Drawing from an 18 km<sup>2</sup> lidar survey and 1 km<sup>2</sup> pedestrian survey, this paper presents a human geography of Aventura that links people, settlement, agriculture, land, and water. The site of Aventura is situated along the Belizean New River with the city epicenter located approximately 2.5 km west of the river. Aventura's city center consists of six adjoining plazas and a seventh connected by an intersite causeway. City infrastructure is also comprised of a ballcourt, a marketplace, and eight temples, the tallest rising 20 m in height. The city and its households were built around pocket bajos, karstic depressions less than 2 km<sup>2</sup> in area, that Kacey Grauer identified as water management features. Households across Aventura are diverse and variable, with some mounds just barely visible above the ground surface. Between Aventura's settlement and the marshes of the New River lies a vast area of raised fields, larger than the footprint of the city itself, identifying Aventura as a potential site of major food production.

**Fitzgerald, Kimberli (City of Salem), Kirsten Straus and Kylie Pine (Willamette Heritage Center)****[98]***Searching for Salem's Early Chinese Community*

Did Salem, Oregon, have a Chinatown during the late 1800s? In this research paper, Kimberli Fitzgerald documents the three-year investigation to answer to this question with her local colleagues Kirsten Straus and Kylie Pine. The author worked with a local advisory committee, including historians, members of Salem's Chinese community, and representatives from the Chinese Consolidated Benevolent Association, the Hoy Yin Association, Friends of the Salem Pioneer Cemetery, and Willamette University. Collectively, the group learned that Salem had a thriving Chinatown for many years that included community leader George Lai Sun and several prominent families. Through a public, community archaeological project a funerary table in Salem's Pioneer Cemetery was uncovered, one of very few physical remnants of the late-nineteenth and early twentieth-century Chinese community. Together, the project committee and today's Salem Chinese community reinstated the funerary table's use in the annual Qingming festival.

Fitzhugh, Ben [71] see Loiselle, Hope

**Fitzhugh, William (Smithsonian Institution)****[153]***Discussant*

**Fitzhugh, William (Smithsonian Institution)****[244]***Deer Stones and the Bronze to Iron Age Transition in Mongolia*

The Late Bronze Age Mongolian culture known for its memorial deer stones and khirigsuur burials (DSK complex), dating to 1300–700 BCE, persists over several hundred years with little change in ritual art and architecture. Deer stones are memorials to deceased leaders that display distinctive features of personal identification within the unifying framework of an overarching religious iconography. Despite continuity, the DSK complex is not monolithic. This paper presents evidence for regional cultural and chronological variation in deer stone art and ceremonial activity based on research at the Khyadag and Zunii Gol sites in north-central Mongolia. Khyadag displays a new class of miniature deer stones and evidence of copper smelting, and at Zunii Gol, an unusual khirigsuur is associated with a deer stone carrying elements of Scytho-Saka animal style art. These sites show geographic and chronological overlap in the later period of the DSK complex and suggest avenues for exploring links with ancient cultures of the Bering Sea.

Fitzmaurice, Rosamund [28] see Saldaña, Gabriela

Fitzmaurice, Rosamund [28] see Watkins, Tia

Fitzpatrick, Scott [74] see Gerard, Paul

**Flad, Rowan (Harvard University)****[202]***Chair***Flad, Rowan (Harvard University), Joshua Wright (University of Aberdeen), Zhanghua Jiang (Chengdu City Institute of Archaeology), Kuei-chen Lin (Academia Sinica) and Zhiqing Zhou (Chengdu City Institute of Archaeology)****[202]***Changes in Land Use and Landscape in Twentieth-Century Chengdu Plain Survey Area*

Various available aerial imagery from the 1960s through 2000s allow for examination of changing ground surface conditions in the Chengdu Plain in recent decades. Surface conditions impact accessibility, visibility, and preservation of archaeological evidence of ancient human activity in the area. They also reflect transitions from a long-lasting, resilient pattern of dispersed settlement that has characterized the Chengdu Plain landscape for thousands of years. This resilient, patchy landscape is evident in the dataset of archaeological material focused on by the CPAS survey. The pattern persisted in more recent patterns of land use and hydrology that have characterized the region up through the twentieth century. We examine the degree to which landscape and land use has changed in the last third of the twentieth century and the first two decades of the twenty-first century. Using locations designated as prehistoric “Activity Areas” by the CPAS, we show those parts of the survey zone where the most dramatic changes have occurred. This highlights those regions where the identified archaeology is most under threat, or possibly already partially destroyed. Contemporary patterns of development and land use must be taken into consideration when interpreting survey data in heavily modified and occupied regions.

Flad, Rowan [202] see Jiang, Ming

Flad, Rowan [202] see Li, Shuicheng

**Fladd, Samantha (University of Colorado, Boulder)****[131]***Chair*

**Fladd, Samantha (University of Colorado, Boulder), Sarah Kurnick (University of Colorado, Boulder) and Katelyn Bishop (University of Illinois, Urbana-Champaign)**

[131]

*Where Have All the Women in Archaeology Gone: Gender (In)Equity in Tenure-Track/Tenured Academic Jobs*

Recent studies have shown that the proportion of female faculty members in anthropological archaeology—while still below the proportion of women receiving doctoral degrees in the discipline—has increased over time. Nevertheless, there has been little consideration of the types of tenure-track / tenured (TTT) jobs for which women are hired. Are there differences in who is hired for the more research-focused jobs at R1 universities and who is hired for more teaching-focused jobs at small liberal arts colleges (SLACs)? In this presentation, we examine prestige, power, and fit in academic archaeology by using the Archaeology Jobs Wiki Page to examine the identities of individuals hired under open searches for TTT jobs over the last decade. Are there differences in the identities of the archaeologists hired by R1 institutions and SLACs? Can we see changes in hiring practices over time? And how might hiring decisions affect the topics and goals of archaeological research and the public perception of our discipline?

Fladd, Samantha [131] see Bishop, Katelyn

Fladd, Samantha [131] see Hoppes, Kelsey

Fladd, Samantha [131] see Kurnick, Sarah

**Fladeboe, Randee (University of Florida)**

[128]

*The Ethics of Macaw Keeping in the Prehistoric Southwest and Northwest Mexico*

This paper considers the ethical components of prehistoric macaw husbandry practices in the cultural areas of the US Southwest and Northern Mexico. Within many traditional Native American cosmological schemes, humans and animals occupy a shared social world with reciprocal responsibilities toward one another articulated through oral traditions, and responsibilities of care are organized along these connections. Macaws are presented as human affines, key figures alongside humans in the organization of cosmology. This ethical context is the larger framework within which I interpret the instrumental techniques of how they were kept. I provide archaeological, ethnographic, and ethological evidence for the intersubjective social relationship between captive macaws and the specific humans charged with their care, presenting how the modification of macaws created ritual platforms for exchanging physical and metaphysical properties, while new human subjectivities also emerged from their informed and skilled interactions with macaws.

**Flammang, Amandine (Université libre de Bruxelles) and Margot Serra (San Francisco State University)**

[205]

*Reconstructing Funerary Practices from a Heavily Looted Tomb: A Case from the Upper Nepeña Drainage, Ancash, Peru*

Prehispanic open sepulcher collective funerary contexts are ubiquitous in the landscape of the Andean highlands. Their study has mostly focused on their architecture and setting, including their role in ancestor worship. Even though some still contain significant material and human remains, very few of these monuments have been thoroughly excavated, mainly because they are looted and supposedly decontextualized. In that sense, the highly visible nature of these tombs in the landscape has made them vulnerable to both ancient and modern vandalism. In this presentation, we discuss the preliminary results of the complete excavation of an open sepulcher funerary context of the machay (rockshelter) type on the western slopes of the Cordillera Negra (Ancash, Peru). They include an assessment of taphonomy, demography, paleopathology, funerary material, and potential chronology. We thereby demonstrate how the combination of thorough excavation and a bioarchaeological study can shed light on these understudied contexts and allow us to reconstruct the meaningful practices that shaped prehispanic Andean funerary rituals.

**Fleeman Garcia, Trace (Oregon Institute for Creative Research)****[151]***The Phantom Lake: Spectral Archaeology in the Tulare Basin*

Since the 1990s, spectral thematics have grown increasingly present in the humanities, stressing the persistence of memory, traces, and absences in the cultural sphere. Anthropologists likewise have contributed to this moment, as with Justin Armstrong's spectral ethnography and Theo Kindynis's graffiti archaeology. This emerging methodology is promising when translated to the study of the Tulare Basin, defined by the eponymous "phantom lake," artificially drained by intensive industrial agriculture. Ethnographically, Yokuts ceremony reaffirms the lake both as one who speaks, a subject, and as a *tripni*, or spiritually potent space; and agricultural communities continue to utilize water-witching on the dry lakebed well into the twenty-first century. In combination with traditional historical-archaeological methods, such as map regression and pedestrian survey, an archaeology of desiccation is constructed. As a precursory exploration, the wider "hauntological" methodology is critically engaged. A hesitancy to engage with the ghost-as-ghost is identified. I contend that the specter is a real social phenomena and must be dealt with as such.

Fleisher, Jeffrey [166] see Brewer-Jensen, Ella

Fleisher, Jeffrey [210] see Merchant, Joe

Fleisher, Jeffrey [210] see Wood, Marilee

Fleming, Elijah [82] see Rabinowitz, Adam

**Fletcher, Roland (University of Sydney) and Sarah Klassen (University of Toronto)****[109]***Diachronic Spatial Organization in Greater Angkor, Seventh to Fifteenth Centuries CE*

The internal spatial organization of Greater Angkor changed profoundly between the seventh and the fifteenth centuries CE—yet in some ways also remained substantially self-similar. Separate settlements merged into one urban aggregation, and massive water storage and transport structures were added, along with a few very large ritual structures, many smaller shrines, and thousands of ponds and occupation mounds. The numerous features that form the social landscape of Greater Angkor created a complex internal pattern of residential clustering that changed significantly over time; however, the relationship between the clusters also appears to have remained quite consistent. Analyses of the temporal changes in the urban landscape, the relationship between populations resident in rice field area and those resident along the transportation routes, the configuration of the residential clusters, and the issue of the social relationships between them addresses the paradoxical issue of Angkor's concurrent substantial transformations and distinct pattern of stable consistency. The paradox has some significance for an assessment of the degree to which the social dynamics of Greater Angkor could sustain the resilience of the urban complex.

**Flood, Jonathan (National Park Service), Timothy Beach (University of Texas, Austin), Sheryl Luzzadder-Beach (University of Texas, Austin) and Alex Walthall (University of Texas, Austin)****[54]***Morgantina's Lost Port: Geoarchaeological Insights into the Paleohydrology of Central Sicily*

The ancient city of Morgantina is today located deep in the dry Sicilian interior, more than 50 km from the sea's edge and the expansive maritime networks of the Mediterranean. Yet, despite the site's remote inland location, there is ample archaeological evidence that in antiquity Morgantina enjoyed the status of an important regional economic center, evidence ranging from large quantities of imported pottery that arrived at the Archaic settlement to the city's sizable Hellenistic agora and eventual construction of a Roman macellum. This apparent divorce between geographic isolation and commercial integration led some scholars to hypothesize Morgantina's hydrologic connectivity must have been better in the past. To explore this idea, the authors collected geophysical, geospatial, and geochemical data that confirm sweeping changes in the

river systems that once fanned across central Sicily. This paper highlights the dynamism of the human-hydrologic relationship in central-eastern Sicily between the Iron Age and present day. By combining drone survey, sedimentary lithofacies analysis, descriptive fluvial geomorphology, and <sup>14</sup>C dating on cutbank sequences, our team has begun to document pre-Iron Age fluvial conditions and subsequent erosional/depositional episodes that followed the expansion of both Greek and indigenous settlements into the central watersheds of the territory surrounding Morgantina.

Flood, Jonathan [178] see Tisdale, Dhillon

Flores, Alondra [239] see Stark, Richard

**Flores, Jorge (Binghamton University [SUNY])**

[57]

*Salt-Making at Santa Catalinas de Salinas: Ecological Stress in the Northern Ecuadorian Highlands from the Eighteenth to the Twentieth Century*

The residents of Santa Catalina de Salinas have exploited salt since prehispanic times in the northern Ecuadorian Andes, possibly in the hands of the indigenous groups of the Chota-Mira valley. However, during colonial times, this activity shifted to the hands of mestizos and Afro-descendant groups introduced in the area to perform economic activities sponsored by estates and plantations. Salt-making, as an assemblage of human and nonhuman agents, fluctuated with other economic activities that generated economic opportunities, social memory, and identity for the residents of this town. The fluctuation and shifting activities have produced ecological stress due to the different factors affecting the production of additional items. Throughout time, many aspects of the salt-making process have affected the production capacity and its immanent disappearance caused by ecological stress. In addition to this activity, introduced economic activities (promoted by sugar cane plantations during colonial times) have recovered hegemony in this area, aggravating the ecological stress. For this presentation, I will emphasize the contribution and roles of different agents to the environmental and landscape transformation of Santa Catalina de Salinas through time, emphasizing the question of how environments and other-than-human actors impact infrastructural projects and vice versa.

**Flores, Paola Michel (Universidad Nacional Autónoma de México)**

[206]

*Arquitectura mudéjar en la Nueva España, un problema arqueológico*

El abordaje de los vestigios arquitectónicos que escapan a la temporalidad mesoamericana suelen estar a cargo de múltiples disciplinas como la Historia del Arte o desde la Arquitectura, en particular desde su vertiente de Restauración, sin embargo, la Arqueología con sus herramientas teórico-metodológicas también tiene aportaciones que hacer sobre ese tipo de patrimonio edificado. La ponencia que se propone aquí, pretende repasar las aportaciones en torno a una forma específica de la arquitectura novohispana, esto es: el arte mudéjar. Dicha expresión artística ha sido tema de debate desde su definición, la cual, para efectos prácticos entenderemos como una realidad artística producto de la asimilación de elementos tanto del arte andalusí como de los estilos europeos y que resultó ser una expresión característicamente hispana. Se partirá entonces, desde el problema de su conceptualización en la Península Ibérica, como dentro de la cuestión que supone su presencia en América, específicamente en la Nueva España, ello desde la óptica de la arqueología, para establecer así una propuesta crítica.

**Flores-Blanco, Luis (UC Davis)**

[205]

*Kaillachuro: The Emergence of Burial Mounds in an Egalitarian Community of the Titicaca Basin, South-Central Andes, 5.0 Ka*

The extent to which emergent complexity involved hierarchical organization in small-scale societies remains an unresolved anthropological question. The research presented here examines inequality among individuals buried some 5,000 years ago at the Kaillachuro burial mound site in the southwestern Lake Titicaca basin,

Peru. This is the earliest known mound site in the region and thus signals the emergence of new social dynamics at a time when economies began shifting from foraging to farming. Excavation of the site, new radiocarbon dates, and preliminary analysis of the materials suggest that the rise of the mound phenomenon occurs within a relatively egalitarian community dynamic that involved few grave goods, male and female mound burials, and modest diets dominated by low-fat vegetable foods.

Flores Esquivel, Atasta [17] see Lentz, David

**Flores-Fernandez, Carola (Universidad Austral de Chile, Center of Advanced Studies in Arid Zones, Chile), Gabriela Covarrubias (Universidad Alberto Hurtado) and Felipe Rivera [135]**

*Manufacture Marks on Shell Fishhooks: Technological Knowledge and Tradition of Coastal and Maritime Societies along the Pacific Coast of Chile*

Fishhooks on *Choromytilus chorus* shells (mussel) can be found along the northern coast Chile (18°–30° Lat. S) and were manufactured between 7500 and 4000 yrs cal BP. Manufacture marks on these artifacts are prominent features to observed, describe, and compare. In this way, the study of shell fishhooks' manufacture techniques allows us not only to deepen our knowledge on these artifacts but also on the logic and knowledge of ancient fishing and artisanal societies. In this study we present the results of a manufacture mark analysis done on archaeological shell fishhooks from several sites along the north coast of Chile. Shell fishhook replicas, made with traditional tools such as sandstone drills and lithic knife, were also analyzed and compared. Through a detailed description of striation characteristics such as direction, width, length, and density, among others, we aim to compare techniques and intensity of work and describe how shell fishhooks were made during the mid-Holocene along the Chilean coast. As rich evidence of shell fishhooks is found around the Pacific coast, we also proposed some guidelines for wider comparative studies.

Flores-Muñoz, Julieta [132] see Sallum, Marianne

**Flores Ramírez, Rosa and Andres Alcantara Salinas [162]**

*La importancia de los rescates arqueológicos: El Caso de la Catedral de Colima*

Los trabajos de rescate arqueológico son constantes en la arqueología de México, el caso que se presenta a continuación es la investigación realizada en 2022 en la Catedral de Colima, donde a partir de un trabajo de supervisión, sobre un problema de drenaje realizado por personal de Monumentos Históricos del Instituto Nacional de Antropología e Historia en el inmueble de la Catedral nos llevó a plantear acciones de rescate con el fin de salvaguardar no solo los materiales arqueológicos que ahí se encontraban sino además realizar la investigación en torno a ellos. Los trabajos de rescate tuvieron una duración de quince días, dejando muchas cosas aun por recuperar e investigar, pero con los resultados obtenidos es posible conocer un poco de la sociedad de Colima en época del siglo XIX, es decir como era su sistema funerario y las características biológicas de los individuos ahí sepultados con este trabajo se da la pauta para plantear nuevas investigaciones en el área.

Florey Folan, Lynda [204] see Gunn, Joel

**Flynn-Arajdal, Yasmine (Université de Montréal), Christina Halperin (Université de Montréal), Carolyn Freiwald (University of Mississippi), Katherine Miller Wolf (University of West Florida) and Miriam Salas [11]**

*Embodied Identities and Moving Bodies: The Archaeology and Bioarchaeology of Ninth-Century Cultural Contacts from the Perspective of K'anwitznal (Ucanal), Guatemala*

Fifty years ago, Maya scholars argued that peoples from the Gulf Coast invaded and settled several sites in

the Southern Maya Lowlands in the ninth century, including the site of Ucanal. These invasions were thought to have led to the collapse of Southern Maya polities. Since these early assessments, archaeological research at the site by Proyecto Atlas de Guatemala and later by the Proyecto Arqueológico Ucanal have uncovered a more textured understanding of the movements and embodied affiliations of peoples living at the site during this time. This paper presents new findings from our archaeological investigations at the site that combine a focus on bodily ornamentation and everyday practices with isotope studies of human teeth. It reveals that ninth-century inhabitants may have had important links to the Gulf Coast, but they also came from and embraced connections with other regions of the Maya area and beyond. Rather than spurring a total collapse, these new interregional relationships were part of a dynamic flourishing of activity that continued into the Postclassic period.

Fogle, Kevin [169] see Goldberg, Kelly

**Foias, Antonia (Williams College)**

[158]

*Discussant*

**Foias, Antonia (Williams College)**

[93]

*Tribute Lists and Bureaucrats: Understanding Classic Maya Politics*

In this paper, I will explore how much we know about Maya politics during the Classic period (AD 250–950), in view of new perspectives that leave behind the centralization vs. decentralization debate. Rather than viewing Maya states as unitary, unchanging, and centralized or decentralized, new perspectives have revealed variation, multiple sources of political power, and important links between political administration, finance, and dynamics. When we think of states and political power, we conjure images of bureaucracies and taxes, with all their negative connotations. Nevertheless, all states require and extract revenues in the form of taxes, tribute, corvée labor, etc. And all states require a certain level of administrative staff to sustain itself. Here, we pursue the archaeological, artistic, and epigraphic evidence for both the political economy and administration of Classic Maya polities, with an emphasis on its variation across space and time.

Foias, Antonia [84] see Duffy, Lisa

Folan, William [204] see Torrescano-Valle, Nuria

**Folch, Ramon**

[172]

*Comitan, “Place of Potters”: Evidence of Specialized Potters in the Valley of Comitan*

Recent work documenting the stored artifacts in museums in Chiapas has led to the identification of large pottery urns, pots, and jars from the region of Comitan that share surprising similarities in manufacture and decoration. Dating to the Postclassic and Late Classic periods, it suggests that specialization was present in the Valley of Comitan ever since. Geographic analysis linked to ethnographic work among the heirs of the Tojolabal potters suggests that the lacustrine soils of Comitan could have been a reason for said specialization. Ethnohistoric evidence such as toponyms, tributes, legal documents, and geographic descriptions shed some light on the matter as well. A better understanding of these production dynamics will increase our understanding and characterization of the marginal Comitan region, long ignored as work in neighboring areas such as the Upper Grijalva River Basin, Guatemalan Highlands, and the Chiapas Highlands seems to have overshadowed it.

**Follensbee, Billie (Missouri State University)****[246]***Chair***Follensbee, Billie (Missouri State University)****[246]***Function Follows Form, Part II: Experimental Archaeology with Formative Period Mesoamerican Greenstone Tagelus Shell Facsimiles as Textile Tools*

Many Formative period Mesoamerican greenstone artifacts are readily identifiable as ornaments, as they have clear counterparts in both form and function in later cultures. Other such artifacts, however, have proven puzzling to scholars, who initially categorized them as “miscellaneous objects,” “objects of unknown use,” or “implements for mysterious unknown purposes.” Reanalysis and experimental archaeology suggest that certain greenstone artifacts were functional tools, likely used for spinning cordage, netting, twining, and weaving; these findings are bolstered by studies of use-wear on Maya jade artifacts that confirm their use as woodworking tools. Because certain greenstone artifacts illustrate rounded forms and hinges, they have been identified as ornamental effigies of bivalve seashells. In 2020, Andrew Turner revealed that some shell effigies are specifically identifiable, noting that Olmec jade “spoons” are readily comparable in form with the Atlantic wing oyster. Accordingly, formal analysis has identified elongated greenstone “clamshells” as effigies of *Tagelus plebeius*, or Atlantic stout razor clam shells; experimental archaeology, meanwhile, confirms that the serendipitously obround and roundrect forms of *Tagelus* make these shells effective as tools for twining, weaving, and netting. This presentation illustrates how experimental archaeology also serves to confirm that the greenstone *Tagelus* effigies themselves serve well as textile-making tools.

Fonte, João [95] see Dias, Rita

Foor, Thomas [184] see Prentiss, Anna

Foran, Debra [224] see Danielson, Andrew

**Ford, Anabel (UCSB)****[165]***Discussant***Ford, Anabel (UCSB) and Frank Spera (Geology UCSB)****[216]***Challenges in the Identification of Fresh Volcanic Glass Shards in Ancient Maya Pottery Sherds*

The major components of ceramics consist of clay and temper. It is assumed that these components are local. The Maya lowlands are dominated by limestone, and its use as temper is ubiquitous. Therefore, the distinct presence of fresh volcanic ash in the Late Classic period pottery is noteworthy. Efforts to identify a local volcanic source closer than 300 km away have failed. In the course of our inquiry, we have made important discoveries. We had assumed that we could type the ash based on a suite of major and minor minerals, as the glass had experienced the greatest heat exposure in the eruption. While our first assessments showed distinctions, later investigation of time/temperature firing gradients demonstrated that there was alteration in the context of firing. Experiments focused on high silica ash that matched the archaeological samples include the rhyolitic California Bishop Tuff and the Ipopango Tuff. Our report here is of the changes consistent with time and temperature firing experiments. Silica (Si) proves a stable element, while others, especially Sodium (Na) and Calcium, are volatile. We identify consistent changes and argue for caution when evaluating volcanic components of pottery; the process of firing is metamorphic.

Ford, Anabel [165] see Horn, Sherman

Ford, Anabel [165] see Shi, Stone

Ford, Anabel [165] see Tran, Justin

**Ford, Ben (Indiana University of Pennsylvania)**

[187]

*Discussant*

**Ford, Ben (Indiana University of Pennsylvania)**

[117]

*Our Future Is Applied: The Applied Archaeology MA Program at Indiana University of Pennsylvania*

Since 2009 the Indiana University of Pennsylvania (IUP) Applied Archaeology MA program has prepared students for archaeology careers outside of the academy. Through constant contact with employers and alumni, as well as an advisory board of archaeology professionals, the IUP program has been responsive to changes in the job market. The Applied Archaeology program is staffed by faculty with applied experience who are dedicated to preparing students for nonacademic jobs. The program relies on courses that foreground the regulatory context for much of archaeology as well as the skills required for compliance and public archaeologies. This coursework is combined with internships, external mentoring, and a variety of field and laboratory experiences that help students meet the Secretary of Interior's Standards and be prepared for professional practice. The efficacy of this program is evident in that, of the more than 100 graduates of the program, 80% continue to be employed in archaeology. Enrollments in the MA program have buoyed the overall department numbers during periods of declining enrollments so that the Applied Archaeology program has provided a stable future for both alumni and the IUP Anthropology Department.

**Forde, Jamie (University of Edinburgh)**

[242]

*Going Up, Coming Down: Ruins, Verticality, and Time in the Postclassic Mixteca*

For peoples of the Postclassic Mixtec highlands, ruins of earlier civilizations were often found on mountaintops outside some of the most politically prominent communities in the region. These ruined hilltop sites came to be viewed as places of primordial origin and were sites of religious pilgrimage. In this paper, drawing from archaeological data, iconography from the Mixtec codices, and ethnohistoric information, I argue that the meanings of these places inhered not simply from the materiality of ruins themselves but how people traveled to and from them, by moving up and down the landscape. I suggest that this kind of vertical movement through space could also constitute a means of moving through time, of potentially both engaging with the past and interceding in the future.

**Forest, Marion (PaleoWest)**

[201]

*Chair*

**Forest, Marion (PaleoWest), Eric Cox (PaleoWest), Matthew Steber (PaleoWest), Kevin Sheehan (PaleoWest) and Madison Lamb (PaleoWest)**

[201]

*Recent Investigations at AZ U:9:173(ASM)/Crismon Ruin, Arizona*

AZ U:9:173(ASM)/Crismon ruin is a Hohokam village occupied from the Preclassic to the Classic periods and located near the headwaters of Lehi prehistoric canal system and on a fertile terrace above the Salt River Basin, today in the City of Mesa, Maricopa County, Arizona. The site is known since the 1920s and has been investigated on several occasions, mostly associated with the development of State Route 202/the Loop 202 around greater Phoenix. Multiple chronological components and a possible hiatus have been identified at the site, indicating both a complex occupational sequence and persistence in the use of the area by Hohokam

communities. Additionally, AZ U:9:173(ASM)/Crismon ruin does not seem to have experienced food supply limitations while most communities at the scale of the Phoenix Basin have experienced issues in their resource procurement strategies at some point. In this poster, we summarize previous and recent research conducted at the site, focusing on two main themes: the changes in settlement patterns over time and the subsistence strategies developed in the area.

Forest, Marion [201] see Huster, Angela  
Forest, Marion [100] see Webster, Serena

**Forton, Maxwell (Binghamton University)**  
**[230]**

*Salient Spaces in the Painted Desert: A Comparative Ceramic Study of the Lacey Point Petroglyph Site*

Lacey Point is a distinctive landmark rising above the Painted Desert in Petrified Forest National Park. This prominent butte harbors a concentration of Ancestral Pueblo petroglyphs encompassing themes of fertility and hunting. Associated with these petroglyphs is a large and diverse artifact assemblage, including thousands of ceramic sherds. This is contrasted by the fugitive architectural remains of a small jacal structure on the butte's summit. Archaeologists have interpreted Lacey Point as a significant shrine site for Ancestral Pueblo communities of the Petrified Forest region. This project assesses these interpretations by comparing the landscape context of Lacey Point to known shrine sites in the American Southwest. To determine if Lacey Point has an inordinately large and diverse ceramic assemblage for a site with minimal architecture, I conducted a ceramic sampling survey of Lacey Point and three neighboring sites on the edge of the Painted Desert. This assessment determined Lacey Point's ceramic assemblage is disproportionately intensive and diverse for a site with a fieldhouse sized structure. This study also found the activities performed at Lacey Point are a mixture of domestic and devotional practices. Altogether, Lacey Point is a distinct site on the Petrified Forest landscape, defying conventional archaeological site categories.

Foster, Michael [201] see Young, Heather

Fowler, Kent [191] see Ross, Jon

**Fowler, William (Vanderbilt University)**  
**[58]**

*The Toltec Diaspora as Political Action*

Archaeological chronologies and material-culture evidence indicate large-scale migrations of Nahua peoples to eastern Mesoamerica in the ninth and tenth centuries CE linked to the collapse of the Toltec state at Tula Chico in about 850 CE. This event marked the commencement of the Toltec diaspora—large-scale population movements out of the region of Tula and radiating south and east. These migrations involved identity politics associated with cultural construction, foregrounded in various contexts of social life. The material culture traits, landscape appropriation, and cultural traditions that facilitate the recognition of Nahua Pipil migrations in the archaeological record should be viewed in a broader context as markers of daily practices, social identities, and political differentiation among different groups of Pipil migrants in competition with each other as well as with Maya, Xinca, and Lenca groups of the region.

**Frachetti, Michael (Washington University, St. Louis)**  
**[110]**

*Discussant*

Frachetti, Michael [79] see Bullion, Elissa

Frahm, Ellery [56] see Gasparyan, Boris  
 Frahm, Ellery [56] see Kovach, Tanner

Francis, Julie [241] see Castañeda, Amanda

**Franco, Nora (CONICET-IMHICIHU; University of Buenos Aires-FFyL) and Lucas Vetrivano (CONICET-IMHICIHU; University of Buenos Aires-FF)**  
**[171]**

*Technological Changes in Patagonia: Debitage Analysis at Chorrillo Malo 2 Site (Upper Santa Cruz River Basin)*  
 Recent researches have shown the presence of technological and, in some cases, chronological discontinuities in the archaeological record of Central-South Patagonia from the Pleistocene–Holocene transition to the Late Holocene. Most of these changes have been recognized on lithic tools. In this presentation, we usedebitage analysis to produce useful information for the interpretation of these changes. We analyze the case of Chorrillo Malo 2, the site with the longest human occupation span identified in the upper Santa Cruz River basin. Although initial human occupations at this site date from ca. 11,200 cal yr BP, the adoption of the Levallois centripetal method (sensu Boëda 1993) was identified at the beginning of the Late Holocene. Due to the small size of the sample, a technological analysis was performed, although only a fraction of the assemblage provides diagnostic information in terms ofdebitage identification. Results obtained indicated the beginning of the utilization of this method on immediately available rocks at ca. 4400 cal yr BP, at around the same time it occurs 95 km to the south, and poses questions about the reasons for this innovation, which does not seem to be related to environmental ones.

Franco, Teresa [19] see Sauer, Jacob

Franco, Valeria [142] see Cruz, Pablo

**Franklin, Elaine**  
**[90]**

*Conceptualizing the Past: The Thoughtful Engagement of Hearts and Minds*  
 Since its founding in 1983, public engagement has been a fundamental aspect of the Crow Canyon Archaeological Center's mission. This presentation provides a synthesis of the center's education work and contextualizes it within the constructs of cognitive theory and social semiotics. Included in this discussion are essential aspects of educational practice that have characterized Crow Canyon's public education programs for four decades; among these are experiential education and inquiry pedagogy, situated learning, multivocality, and the inclusion of descendant communities.

**Franklin, Jay, Lauren Franklin (University of Arizona), Brian McKee (Tierra), Andrew Lack (Tierra) and Mitchell Keur (Tierra)**  
**[72]**

*Late Preclassic and Late Classic Period Archaeology in the Upper Reaches of Queen Creek, Superior, Arizona*  
**[WITHDRAWN]**

**Franklin, Paris (University of Wyoming)**  
**[41]**

*Small Things Brought Together: Analyzing the Microdebitage of Experimental Lithic Assemblages*  
 Microdebitage—flakes and flake fragments < ¼-inch in size—are often overlooked. Because the average size

of debitage decreases as reduction progresses, archaeologists often infer tool maintenance (e.g., scraper resharpening or projectile point rejuvenation) when finding large quantities of small debitage in archaeological contexts. However, experimental flintknapping has shown that small flakes and flake fragments are created throughout tool production. Additionally, if humans clean up and move flintknapping debris, they are more likely to move larger debitage away from the area in which it was produced. In this project, I analyze the microdebitage from 16 experimentally knapped modern assemblages on cryptocrystalline silicate materials. These experimental assemblages include production debitage and resharpening debitage from tools including unifacial scrapers, bifaces, and flake blank tools. Debitage from each stage of reduction and each resharpening episode were collected separately. My objective is to determine if there is a significant difference between the microdebitage generated during stone tool manufacture versus resharpening. These results will help archaeologists determine if tool production or maintenance was the dominant stone-working behavior in archaeological assemblages with high proportions of small flakes.

**Frederick, Kathryn (Olivet College)**

[232]

*Now and Later: Defining Reliant and Redundant Food Storage Strategies Utilized by Hunter-Gatherers*

Research on storage in small-scale societies has, until recently, narrowly focused on determining the form and scale that food storage took, and its relatedness to increasing social complexity. This research, instead, looked at the purposeful decision-making behind the use of food storage as a risk management strategy in non-sedentary societies. Subterranean storage pits appear in the archaeological landscape of the northern Great Lakes after ca. AD 1000 and tribal communities continued to use them through the historic period. During the Terminal Late Woodland period (ca. AD 1000–1600), subterranean food storage containers were systematically used by tribal communities with a spatially and seasonally restricted fisher-forager-horticulturalist subsistence system to create a stable food supply. Combining experimental archaeology, ethnographic and ethnohistoric data, along with archaeological data on food storage, this research examined the technology and behavioral patterns for use of subterranean food storage utilized by hunter-gatherer societies around the world. The collected data exhibited two prominent patterns for storage use, reliant and redundant. I argue that the northern lower Michigan Late Woodland people incorporated redundant food storage practices into their existing risk management strategies as a response to increased population and reduced territory.

**Freeman, Jacob (Utah State University)**

[198]

*Chair*

**Freeman, Jacob (Utah State University), Raymond Mauldin (University of Texas, San Antonio), Mary Whisenhunt (University of Texas, San Antonio), Robert Hard (University of Texas, San Antonio) and John Anderies (Arizona State University)**

[198]

*Repeated Hunter-Gatherer Intensification and Population Decline Events*

We test a general hypothesis that may explain large population decline events among human populations: the intensification of production generates a cross-scale tradeoff between individuals generating a surplus of energy to maximize their fitness and the vulnerability of a population as a whole to large decline events, known euphemistically as driving over a “Malthusian Cliff.” We test this hypothesis in Central Texas by developing a collection of time-series that estimate changes in human population density, modeled ecosystem productivity, human diet, and labor intensive cooking over the last 12,500 years. Our analysis indicates that Texas hunter-gatherers experienced three Malthusian Cliffs, and evidence indicates that each of these cliffs was preceded by intensification on low-ranked resources that require significant processing to unlock calories and nutrients. The three decline events may have been necessary releases in the short-term for Texas foragers to experiment with social and technological changes that raised the long-term carrying capacity of their environment.

Freeman, Jacob [198] see Black, Geena

Freeman, Jacob [198] see Finn, Jennifer

Freeman, Jacob [198] see Solis, Kristina

Freidel, David [93] see Marken, Damien

**Freiwald, Carolyn (University of Mississippi), Christina Halperin (University of Montreal), Camille Dubois-Francoeur (University of Montreal) and Jacob Harris (Independent)**  
[218]

*Late Classic Maya Bone Tool Production and Use at Ucanal, Guatemala*

Bone tool workshops are rare in Mesoamerica, but both finished products and debitage suggest that human bones (includes images) were used alongside whitetail deer, turkey, and other species to produce tools such as needles and awls, as well as ornaments. The debris of Late Classic bone production was recovered from the Maya site of Ucanal, Guatemala, intermingled with carbon, lithics, and shell in the platform fill of an elite residential group. A zooarchaeological, isotopic, SEM, and ZooMS analysis of the species and the stages of production reveal which species were used for particular tool types and the types of catchments where the animals were acquired. The workshop faunal assemblage is then placed within the context of the fauna recovered to date by the Ucanal Archaeological Project to compare what was produced by the elite residential group with tools used and discarded in other elite and commoner households throughout the site. We also include examples of how animals were used in other ways at Ucanal, with multiple burials of dogs and birds and offerings of burned stingray spines, tooth beads, and marine shell ornaments, providing a unique look at the diversity in fauna used in one Maya city.

Freiwald, Carolyn [11] see Flynn-Arajdal, Yasmine

Freiwald, Carolyn [84] see Shiratori, Yuko

**French, Jamie (Oregon SHPO)**

[194]

*Discussant*

**French, Jennifer (University of Liverpool)**

[184]

*Peopling the Paleolithic: Demographic Approaches to Earliest Prehistory*

With its sparse and often fragmentary human fossil record, comparatively limited range of material culture, and almost total absence of structural evidence, reconstructing local and regional population levels in the Paleolithic is especially difficult. Focusing on the European Paleolithic record, this paper will briefly review the methods at our disposal to reconstruct demography in earliest prehistory and outline best practice for the use of ethnographic data from recent foragers in these reconstructions. Using examples from across the nearly two-million-year span of the European Paleolithic, I highlight areas of uncertainty and divergence in current Paleolithic population estimates, and discuss the implications of these for our understanding of long-term population trajectories and cultural change in early prehistory.

**French, Kirk (Penn State University)**

[108]

*Discussant*

**French, Kirk (Penn State University)**

[125]

*An NSF Broader Impact Story in the Teotihuacan Valley of Mexico: 60 Years in the Making*

For many, the “broader impact” of a grant proposal frequently involves outcomes that will happen somewhere between immediately and the next five years. Yet, the scope of the broader impact is often

unexpected, unknown, and/or will take place many decades later. In 1960, when Eric Wolf received a small grant from NSF to support a conference on the Basin of Mexico, no one attending could have foreseen the profusion of quality research, student training, and community involvement that would take place in the coming years that vastly increased our understanding of the past (e.g., Armillas, Coe, Millon, Palerm, and Sanders). The Land and Water Revisited (LWR) documentary project is but another example of the broader impact of Wolf's 1960 conference. LWR is a remake of Bill Sanders's 1962 documentary, *Land and Water*, filmed during the second season of his 15-year Basin of Mexico Survey Project. The original film provides an invaluable snapshot of agricultural and land-use practices in the area just prior to the urban explosion of Mexico City. This poster details the personal, emotional, and broader impacts the LWR film project has had on several families in the Teotihuacan Valley.

**Frenchman, Lia (Quinault Indian Nation)**

[107]

*Discussant*

**Freund, Kyle (Far Western Anthropological Research Group), Daron Duke (Far Western Anthropological Research Group), Jennifer DeGraffenried (US Army Dugway Proving Ground), Nate Nelson (US Army Dugway Proving Ground) and D. Craig Young (Far Western Anthropological Research Group)**

[41]

*The Fluted Point Component of the Old River Bed Delta, Utah*

This poster contextualizes archaeological sites with fluted point components and related finds on the Old River Bed (ORB) delta in western Utah. Between ~13,000 and 9500 cal BP the ORB delta endured as a large distributary-fed wetland in what is now the dry and forbidding Great Salt Lake Desert. This vast wetland is widely recognized for its Western Stemmed archaeology, but recent finds add to a lesser-known, Younger Dryas-age fluted component that now merits further attention. This poster compiles an up-to-date database of fluted points and associated assemblages from the ORB delta and contextualizes their distribution in relation to local geomorphology and related and similarly timed components (e.g., crescents, Haskett points). We also document the prevalence of various raw material types and present lithic sourcing results that help to document toolstone procurement ranges. Our aim is to highlight the possible interplay between various social groups that inhabited the region in the terminal Pleistocene and shed light on the technological choices that helped shape how they moved and possibly interacted across this landscape.

**Friberg, Christina (Indiana University Museum of Archaeology and Anthropology)**

[111]

*Chair*

Friberg, Christina [217] see Bardolph, Dana

Friberg, Christina [111] see Herrmann, Edward

Friedl, Lukas [121] see Benedetti, Michael

**Fries, Eric (UNLV)**

[165]

*Regional Agricultural Potential at the Aguacate Sites, Western Belize*

The ancient Maya settlements of the Aguacate region of western Belize feature a dispersed settlement pattern spread across a highly varied landscape. Both soil and water resources are unevenly distributed across the region, interspersed with karst outcrops and ridges. Nonetheless, residential features can be found

throughout the entire area. It remains to be determined how these settlements were provisioned. The model used here combines project settlement data and a digital elevation model to assess which parts of the project area may have been utilized for milpa agriculture. The resulting data are then used to estimate calorie production for the region and reassess existing population estimates in light of the potential for local agricultural production.

Friess, Martin [226] see Manni, Franz

**Frim, Michael (Harvard University)**  
[250]

*Square Knots: A Case Study of Quipus AS55 and AS56 and Evidence for Square Root Calculation and Land Redistribution in the Andes*

Quipus, the record-keeping tools of the Incan empire, offer insight into the mathematics of the Andes through the numerical records embedded in them. AS55 and AS56, a pair of quipus found in association with each other, feature complex mathematical relationships in the numbers recorded on them. These properties were first presented and analyzed in a previous study on the subject, which concluded that the Andeans responsible for the creation of these quipus must have been capable of manipulating fractions and non-integer numbers. However, deeper analysis of the numbers recorded on AS55 and AS56, especially with the use of modern mathematical software, hints at a greater mathematical complexity than initially realized, suggesting the use of high-level mathematical techniques in the production of the quipus. Specifically, this may have involved procedures for solving abstract equations, for estimating complicated arithmetical expressions, and for estimating square roots. Moreover, the mathematics of AS55 and AS56 has practical applications in relation to land allotment, particularly concerning the redistribution of land in spatially efficient ways. This type of land redistribution was prevalent during and after the Spanish conquest of the Andes, indicating a possible connection between colonial processes and the mathematics of these quipus.

Fritz, Alicia [41] see Goodling, Bailey  
Fritz, Alicia [101] see Sherfield, Anne

**Fruhlinger, Jake (Idaho National Guard)**  
[209]

*Discussant*

Fruhlinger, Jake [88] see Conti, Alberto  
Fruhlinger, Jake [94] see Hoffman, Matthew

**Fryer, Tiffany (University of Michigan)**  
[227]

*Infrastructures of Race and War: Tracing Historic Roads in Postwar Quintana Roo*

The last half of the nineteenth century was for Yucatan, like much of the Atlantic World, a time of extreme tumult. Having recently gained its independence from Spain, the fledgling nation found itself plunged into numerous violent, political conflicts. None had so lasting an impact as what has become commonly known as the Caste War of Yucatan. Arguably the most successful anticolonial, Indigenous insurrection to have been mounted in the Americas, this war transformed the peninsula. Since 2013, I have been working in collaboration with predominantly Maya community members from the historic parish where the conflict broke out. Through archaeological survey and excavation, archival recovery, and oral history collection, we have traced the ways structural violences underpinned the social and material forms the war took. In this talk, I offer an example of how roads, routes, and negative spaces become key “archives in the landscape,”

essential to understanding the material relationship between racial geographies and political violence. Ultimately, I aim to show how the shifting geographies of the long nineteenth century (in this case, roughly the 1780s to 1930s) contributed to both how the Caste War materialized and how its aftermath laid the foundations for today's social geographies.

**Frykholm, Soren (University of Michigan) and Stephen Whittington**  
[91]

*Spatial Analysis and Community Organization at Iglesia Gentil (San Pedro Teozacoalco), Oaxaca*

Between 2013 and 2017, archaeologists used GPS units to map Iglesia Gentil, a prehispanic mountaintop site in the Mixteca Alta of Oaxaca, Mexico. In addition to thousands of agricultural and residential terraces, more than 750 structures were recorded along with ancient roads, platforms, patios, and surface artifacts. In this paper, we analyze the structures at Iglesia Gentil, including their size, density, and distribution. Network and cluster analyses shed further light on this architectural dataset with implications for spatial and social organization at this *cabecera*, or administrative center. Ultimately, we contemplate the presence and delineation of ancient neighborhoods. Our results are discussed in the context of findings from contemporaneous sites in the Mixteca Alta as well as ethnohistoric units of community in Oaxaca such as the Mixtec *siqui* and Spanish “*barrio*.”

Fujita, Harumi [71] see Jazwa, Christopher

**Fuller, Brittany (Binghamton University)**  
[27]

*Sacrificing SAIS: Ceramic Offerings from Huari, Peru*

Ceramic offerings are an essential practice utilized by the Wari empire of the Central Andes throughout the Middle Horizon (AD 600–1000). While well-known for the Conchopata oversize ceramic offering tradition where large, oversized urns and faceneck jars were ritually smashed in civic-ceremonial events and left in situ or interred, this practice has yet to be documented at the capital site of Huari. Instead, a different pattern of intentional breakage in ceramics has been observed at the Patipampa sector of Huari that focused on the Southern Andean Iconographic Series (SAIS) assemblage. While the oversized vessels themselves are infrequent, patterns observed in those deliberate destructive practices have been applied to other vessel forms at Patipampa, most notably with blows directed to the faces of effigy vessels. For other instances or forms, kill holes were utilized over direct blows to the principal figures.

Fuller, Benjamin [3] see Cardoso, Jessica

Fuller, Benjamin [252] see Jaouen, Klervia

Fuller, Benjamin [252] see Moubtahij, Zineb

**Fuller, Dorian**  
[20]

*Discussant*

**Fuller, Dorian**  
[20]

*Unentangling Hotspots and Episodes in Pre-domestication Cultivation of Cereals: Examples from West and East Asia*

The growth of empirical archaeobotanical data has highlighted that domestication processes in cereals were spread out over both time (millennia) and space (100,000s rather than 10,000s of km<sup>2</sup>). Updated data from West Asian cereals and pulses, alongside Chinese millets and rice, are analyzed. These data allow quantification of amounts of change and rates of change in cereal non-shattering and/or seed size increase, which provide a

basis for identifying shorter episodes of more rapid evolution for each trait or species. These rapid sub-episodes can be placed in space and cultural context. This in turn raises new question about which changes in practices or environmental conditions may be regarded as contributory. It can suggest that increasing reliance on crops over wild foods correlated with periods in which domestication sped up, but this correlates with sedentism in China and the advent of animal herding in West Asia, indicating contrasts between pathways.

**Fulton, Kara (University of North Texas)**

[211]

*Student Perceptions of Transferrable Skill Development in an Online Archaeology Course*

Many universities focus on the idea of graduating students who are “career ready.” One of the pillars of career readiness is the emphasis on transferrable skills, those skills focused on the ability to do something (e.g., think critically), as opposed to content-based or discipline-specific knowledge. In a world where the average person changes careers 5–7 times during their lifetime, transferrable skills are becoming increasingly important to help leverage career options. Due to the varied nature of archaeological research, archaeology is a field that is well-suited to teach different transferrable skills to students in any major. This study explores transferrable skills in the context of a high enrollment (approx. 160 students), asynchronous online, undergraduate, general education introductory archaeology course. I examine student perceptions about their own transferrable skills, collected through a pre- and post-survey. Specific skills considered include critical thinking, written communication, quantitative, and teamwork skills—some of the top qualities today’s employers seek in new hires.

**Furlong, Julia (Arizona State University)**

[121]

*A Paleoclimate Study from Central Washington State along the Main-Stem Columbia River*

Paleoenvironmental data is an important variable to consider when investigating and assessing prehistoric cultural change. This study presents a new paleoenvironmental reconstruction from central Washington State within the Columbia Plateau cultural area. This analysis represents the first large-scale paleoenvironmental reconstruction on the main-stem Columbia River and one of the only paleoclimate reconstructions in the region that uses exclusively archaeological materials. Ten paired mussel shell (*Margaritifera falcata*) and charcoal samples from archaeological contexts along the Columbia River were submitted for carbonate analysis and radiocarbon dating. The results of this paired analysis are presented here, along with major technological and cultural transitions within the Plateau region. By comparing these datasets, insights into the effect of climate stability on past human adaptations and land-use can be investigated throughout the Plateau.

Furlong, Julia [143] see Bush, Kelly

Furlong, Julia [132] see Coon, Anna

Fusco, Heather [44] see Cerone, Jordan

**Futty, James (Scripps Institute of Oceanography, UCSD; San Diego State University), Jillian Maloney (San Diego State University), Molly Casperson (US Army Corps of Engineers), Teresa Wriston (Desert Research Institute) and Shannon Klotsko (University of North Carolina, Wilmington)**

[62]

*High-Resolution Geophysical Characterization of Geology and Acoustic Water Column Signatures in Willamette Valley Reservoirs, Oregon, USA*

Inland flood-control reservoirs represent a novel analog for studying submerged terrestrial landscapes. The same scale and time-independent processes that impact coastal environments through sea-level changes are also produced through a reservoir’s annual draft and fill cycles. Within these reservoirs, geophysical data collected

during high water levels can be ground-truthed with terrestrial methods during drawdown. Here, we present Chirp sub-bottom and sidescan sonar data collected within reservoirs of Oregon's Willamette Valley investigating the suitability of these methods for identification of paleolandforms and archaeological sites in drowned river valleys. These data are used to test the human altered lithic detection (HALD) method, which uses acoustic signatures in the water column of Chirp data to detect submerged stone age sites containing human altered lithics. The HALD method has previously been field tested in limited geographic settings. We present observations of water column noise that appear generated by materials other than human altered lithics and the results of field experiments that test the water column noise signatures of human altered obsidian, historic and modern glass, flaked crystalline basalt, and quarried chert. The data suggest more work is needed to fully develop the HALD method across a wide range of geographic settings and materials.

**Fyles, Madeleine****[9]***More than Kindling: Algarrobo Posts and Social Memory on the Peruvian North Coast*

The ancient Moche site of Huaca Colorada (AD 650–850) on the north coast of Peru was the center for elaborate feasting events and rituals of human sacrifice. This ceremonial center has been the focus of intensive archaeological study, yet the spatial distribution of wooden posts within the Moche architectural platforms remains under-analyzed, despite the fact that they constituted prominent and often over-engineered features of Moche archaeology and were made from the venerated algarrobo tree (*Prosopis pallida*). These wooden posts are a unique feature as they were routinely recycled in later architectural renovations of platforms at Huaca Colorada through a careful process of extraction and re-installation. This contrasts remarkably with the treatment of the surrounding adobe platforms, walls, and floors which were intentionally destroyed, buried, or immolated during each new phase of reconstruction. This paper will examine the endurance of these posts within (and between) Moche ritual spaces and elucidate their possible purpose in the materialization of social memory or their role as metaphorical trees of life that engendered genealogical and cosmic continuity in the face of cyclical time of transience, death, and change.

**Gabbard, Aubree (Arizona State University) and Emily Sharp (Arizona State University)****[30]***A Bioarchaeological Approach to Demographic Patterns and Preadult Deaths in the Andean Late Intermediate Period*

During eras of heightened, intergroup conflict, noncombatants may experience increased risk of death, either as a direct result of targeted killings or from more indirect means stemming from resource stress and inadequate nutrition, for example. Documenting whether changes in mortality during violent time periods deviate from expected demographic patterns is central to understanding this issue. Here, we present the relative proportion of juveniles—separated into chronological age ranges—to adults within a sample of 199 individuals who lived at various sites in the Callejón de Huaylas, Peru, ca. AD 1100–1450. Prior research has reported instances of perimortem trauma among the sample's preadults during this time period; however, it is unclear if these suspected deaths represent a marked change in mortality. To evaluate this claim, we contextualize our results with comparisons to areas outside the north-central highlands, focusing on the frequencies of reported juveniles at other sites dating to the Late Intermediate period. We also consider how factors such as sample size or underenumeration of infants influence the observed demographic patterns. This research lays the groundwork for more robust paleodemographic reconstructions in the north-central highlands and for more nuanced considerations of childhood and adolescence in the late prehispanic Andes.

**Gaddis, Katherine (University of Nevada, Las Vegas), Ariel Gruenthal-Rankin (Binghamton University, SUNY; Cal Poly Humboldt), Marissa Ramsier (Cal Poly Humboldt) and Arkadiusz Koperkiewicz (Uniwersytet Gdanski, Poland)****[30]***Disability, Impairment, and Care: An Analysis of Trauma Patterns from Beżławki, Medieval Prussia*

The bioarchaeological analysis of trauma in skeletal remains provides insights into the lives and lifestyles of

past populations. Conventionally, such analysis has focused on military-aged males, with less attention paid to other demographic groups. The late-medieval cemetery site at Beżławki, Poland, provides an opportunity for a relatively broad analysis across an adult skeletal sample ( $n = 57$ ). The site stems from an era of complex social and environmental transformation following the thirteenth-century Prussian Crusades. Therefore, in addition to observing trauma across age groups, we were able to explore relationships between observed patterns of traumatic injuries and colonization and religious conversion in the area. We analyzed both craniofacial and post-cranial skeletal elements for evidence of trauma and general indicators of activity patterns, health, and lifestyle. While few instances of trauma were observed among the Beżławki sample, we present case studies of traumatic injuries that may have resulted in impairment or disability. Drawing on the bioarchaeology of care, we present interpretations as to how traumatic injuries may have been attended to in medieval Beżławki. Findings are indicative of both physiological stress and resilience among members of the Beżławki population.

**Gaggioli, Amanda**  
[233]

*The Anthropogenic and Geogenic Coproduction of Seismically Triggered Soft Sediment Deformation Structures (SSDS) in Helike, Greece*

Factors of earthquakes in archaeology are often relegated to disaster and collapse narratives. Causality runs from the “natural” extreme to its human impacts. Following political ecology and Science and Technology Studies literatures and using the case of Helike, Greece, from the third millennium BCE to fifth century CE, I demonstrate how an empirical separation and ontological conception of human/culture versus nature proves to be misleading in archaeological investigations of earthquakes and other geological hazards. Applications of soil micromorphology and considerations of local environmental knowledge reveal how combined anthropogenic constructions and geological conditions coproduced seismically triggered soft sediment deformation structures (SSDS) in direct association with characteristic architectural damage. The material-geological observations from Helike resemble Greco-Roman perceptions as gleaned from ancient textual sources on earthquakes (seismos, terrae motu) in relationship to soil and water conditions and the human-built environment. Divergent natural scientific preconceptions versus socio-natural Greco-Roman perceptions reveal the consequences of present-day politics and power in the identification and interpretation of geological aspects of the human past from the material-geological record. This reflection on the anthropogenic and geogenic coproduction of SSDS demonstrates the need for both rigorous critique and advancement of scientific approaches and also the incorporation of local environmental knowledges.

**Gagnon, Celeste (Wagner College), Bethany Turner, Richard Sutter and Gabriel Prieto**  
[3]

*The People of the Land and the People of the Sea: Tracing Residence and Relationships between Littoral and Chaupiyunga Populations in the Moche Valley during the Early Intermediate Period*

Exploring mobility and inter-community relationships has been an important area of research in the precolumbian Andes since Rostworowski first argued for economic and ethnic divisions between communities of fishers and farmers on the Peruvian north coast. To address this issue in the Moche Valley, we examined Viru period (150 BC–AD 500) dental remains of 12 individuals recovered from Huanchaco Bay and 10 individuals excavated from Cerro Oreja, on the western edge of the chaupiyunga. Ratios of  $^{87}\text{Sr}/^{86}\text{Sr}$ ,  $^{206}\text{Pb}/^{204}\text{Pb}$ ,  $^{207}\text{Pb}/^{204}\text{Pb}$ ,  $^{208}\text{Pb}/^{204}\text{Pb}$ , and  $\delta^{18}\text{O}$  were characterized in enamel carbonate to estimate residential origin and mobility. Preliminary analyses suggest that strontium and lead isotopes significantly discriminate between littoral and upland residence in the Moche Valley, while  $\delta^{18}\text{O}$  values are characterized by some overlap between the regions. Furthermore, individuals recovered from Cerro Oreja show a wider range of  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $\delta^{18}\text{O}$  values, possibly indicating greater mobility in the chaupiyunga compared to the coast. This finding is further supported by analysis of dental non-metric traits, which indicate greater homogeneity among the littoral populations of the Moche Valley. Variability in Cerro Oreja’s Viru period population may be attributed the chaupiyunga’s status as location of interaction between the coast and the sierra.

Gagnon, Celeste [134] see Torres Morales, Genesis

Gajardo, Javiera [59] see Uribe, Mauricio

**Gala, Nicholas, Anna Mika, Michael Wilson, Jeremy Williams and Robert Walker**  
[88]

*Comparing the Durability and Robusticity of Obsidian and Chert Projectile Points*

Stone weaponry and tools were fundamental to the success of past peoples. Stone weaponry varies dramatically, with both functional and nonfunctional factors contributing to this variation. The durability (whether a stone tip breaks or not) and robusticity (how much damage is incurred upon breakage) of stone weapon tips were two important functional factors that experiments have shown are influenced by different variables, such as raw material type. We present the results of two controlled experiments—one semi-static fracture and the other dynamic impact—comparing chert versus obsidian stone tip durability and robusticity. The results of the first set of experiments show that obsidian stone tips require less force to break than do chert stone tips. The second set of experiments demonstrates that obsidian stone tips are less durable and robust than chert stone tips. Our results are consistent with previous experimental comparisons of chert versus obsidian stone tips, and support the hypothesis that past peoples, when presented with different raw materials, likely weighed their costs and benefits in the process of selection.

Galfi, Jovan [47] see Belmiro, Joana

Galili, Roy [241] see Rosen, Steven

**Gallaga, Emiliano (UNACH)**  
[172]

*Los Chimalapas, the Connection of the Zoque with Oaxaca*

The archaeological community of the Zoque is still under development in the state of Chiapas. Most of the archaeological research focuses on the Maya and some on the Soconusco Coastal region, but very little research on the Zoque themselves. We know that the Zoque had a very complex long-distance regional trade network from where they acquired goods, such as black obsidian from Central Mexico or Usulután ceramic types from El Salvador. But what happened to the prehispanic communities to the east? With Oaxaca? Foster mentions that the Chimalapas region, the connection between the Oaxaca Isthmus and the Central Depression of Chiapas, would be an interesting region to study such relationships. In this paper, we will present what we know of this region and its possible connections with this unknown archaeological region.

Gallaga, Emiliano [223] see Chiou, Katherine

**Gallagher, Joanne**  
[44]

*Exploring Exhibit Spaces, Content, and the Visitor Experience: An Analysis of Southwestern Archaeological Exhibits*

Museum studies and Archaeology have had an interrelationship in pursuits of knowledge and perceptions of visitors. Different interpretations of Indigenous peoples have also evolved in these two fields, and within the last few decades these representations have affected Indigenous Peoples, Museum institutions and visitors. For museum studies, there has been an awakening of critical analysis into how museum institutions have portrayed biases in past exhibitions. Researchers have studied the type of visitors that are drawn to these areas, and how successful both older and newer displays are in engaging the public. This research project was

conducted at the Museum of Northern Arizona within two of its exhibits: The Archaeology Gallery, and The Ethnology Gallery. For my research I have mapped the macro movements of visitors within these two exhibits, analyzed the content/media used within these displays, and conducted visitor intercept interviews with guests. I aim utilize this research to explore possible patterns between the communication of knowledge concerning Indigenous Peoples in museums and the spatial interactions of visitors in these controlled spaces.

**Gallareta Cervera, Tomás (Kenyon College), Anna Novotny (Texas Tech University) and Brett Houk (Texas Tech University)**

**[205]**

*Place Making and Remaking: Early Classic Mortuary Rites at the Ancient Maya Site of Chan Chich, Northwest Belize*  
Funerary customs and monumental architecture in the Maya Region are viewed by archaeologists as markers of social status and complexity. The intersection of mortuary rituals and the built environment gives us a window through which to understand the development of social complexity. Excavations at Chan Chich, a medium-sized city located in northwest Belize, have shown evidence of complex mortuary rituals in its monumental center between AD 250 and 380, a pivotal moment for consolidation of power by divine kings and their lineages in the area. Evidence for divine kingship at Chan Chich was found in 1997 in Tomb 2, a Terminal Preclassic/Early Classic mortuary context containing a jade bib-helmet ornament. A second bib-helmet ornament was found in 2016 within a stone crypt containing the skeletal remains of at least three individuals, one primary burial whose interment resulted the disarticulation of the other two. This presentation focuses on these contexts and their relationship with other mortuary contexts in northwest Belize during the Early Classic. The construction of mortuary architecture on top of a Middle Preclassic floor, burial goods, and reuse of the crypt suggests that these individuals were the metaphorical and literal foundation of local elite.

Gallareta N., Tomas [93] see Bey, George

Gallivan, Martin [203] see Jenkins, Jessica

**Gallo, Giulia (University California, Davis)**

**[214]**

*Chair*

**Gallo, Giulia (University California, Davis)**

**[214]**

*Investigation of Thermal Alteration of Dry Bone via Spectroscopic Analysis*

The initial status of bone prior to burning and thermal alteration influences the resultant chemical and structural composition, monitored in this study with Fourier-transform infrared spectroscopy (FTIR) with an attenuated total reflectance (ATR) attachment. Fresh, fully hydrated mammalian cortical bone and dry mammalian cortical bone, with organics partially to fully depleted, were burned in oxygen atmospheres to two temperatures (300°C and 700°C) to establish a referential collection of baselines for interpreting archaeological burnt bone (e.g., potential fire-using behaviors by hominins). Burning bones with depleted organics, particularly sun-bleached and heavily weathered bone, have spectroscopic similarities to bones burned at low temperatures (300°C). Interpreting the results of such analyses is challenging because it is difficult to identify the organic status prior to burning. Overall, this study suggests that the condition of bone used for experimental and zooarchaeological studies adds a dimension of uncertainty that must be accounted for when designing experimental protocols and adds new sources of variation to consider for interpretations of archaeological burnt bone.

**Gallo, Tiziana and Craig Cipolla (Tufts University)****[65]***Challenging Birdstone Typologies: A Southern Ontario Legacy Collection Revisited*

Birdstones are a morphologically diverse group of ground stone objects found across eastern North America with concentrations around the Great Lakes region. In this paper, we revisit an assemblage of birdstones from the Royal Ontario Museum's Archaeology of the Americas collection to challenge the fixity of existing birdstone types. Popular among antiquarians since the mid-nineteenth century, these enigmatic artifacts were first categorized according to evolutionary principles inspired by the natural sciences. Relative chronological orderings relied on morphological complexity, from the simplest to the most elaborate form. As more birdstones were found in context, archaeologists established three culture-specific types that persist to this day. Drawing on assemblage and anarchist theories to challenge the fixity of these three types, we consider how the properties of distinct stones relate to birdstones' various and mutable forms and propose a materials-centered, situated, and flexible approach to birdstone typologies.

Galo, Luisa [131] see De León, Adriana

Galowicz, Timothy [28] see Crandall, James

**Galvan Benitez, Miguel Angel****[26]***El manejo del agua en Monte Albán-Atzompa*

La recolección y almacenamiento de agua pluvial es una de las prácticas más antiguas en Mesoamérica. La investigación arqueológica en diversos sitios ha permitido la identificación y documentación de sistemas de canales, depósitos subterráneos, galerías filtrantes y almacenamiento en recipientes, el sistema de desagües y el más común que son los depósitos a cielo abierto. En el caso específico del Conjunto Monumental de Atzompa, los estudios arqueológicos sobre el aprovechamiento del agua de lluvias no han sido extensos, sin embargo, gracias al hallazgo en una de sus primeras temporadas, se logró identificar y estudiar un elaborado sistema de conducción y depósito de almacenamiento de agua. En la presente ponencia se exponen valiosos datos sobre la captación, distribución y usos de las aguas pluviales en la parte sureste del sitio, dando cuenta de cómo la planeación urbanística de Atzompa iba de la mano con la solución al problema del abastecimiento de agua en el lugar.

**Gamble, Erin (University of Washington)****[244]***Precolonial Hokkaido and East Asian Trade: Exchange and Identity Formation of the Okhotsk Culture*

This research explores ways precontact commodities trade networks, originating in distant nation-states and empires, can create the conditions to trigger changing social relations and novel identities far from market centers. I argue that a shift in the functional role of trade from one focused on social relationships to one focused on goods, brought about by communities becoming engaged in and entangled with commodities markets, would later drive settler-colonial dynamics. Within this context, I study ceramic sherds as the primary means for investigating temporal changes in trade networks and social identities. On one hand, I use these sherds to quantify connectedness via provenience studies using geochemical characterization and petrographic analysis. Specifically, I use laser ablation-inductively coupled-mass spectrometry (LA-ICP-MS), portable X-ray fluorescence (pXRF), and stable isotopes for my geochemical studies. On the other hand, I use them to examine shifts in how people were making pots through formal analysis and thin section analysis.

**Gambrill, Kylie (Furman University) and Andrew Womack (Furman University)****[241]***New Research into Environmental Contexts of Southeastern Rock Imageries*

Rock imagery can be found across the globe, but research on this topic is still widely segmented by present

political boundaries. In this study we transcend boundaries at the state level in the southeastern United States to better recognize and analyze patterns of rock imagery types and their environmental contexts across the region. To do so we created a database of rock imagery sites in South Carolina, North Carolina, and Georgia and then conducted spatial analysis in ArcGIS Pro and statistical analysis using R. We found that patterns of imagery types and environmental contexts do emerge across the Southeast in ways that provide insight into the potential uses of these sites. We suggest that studies of rock imagery can provide a window into what was important to people in the past and can draw attention to indigenous histories in a region where they have widely been erased or ignored.

Ganiyu, Mubarak [95] see Morrow, Giles

**Gann, Douglas (Chronos Digital)**

[185]

*Cry Disney: The Potentials, Perils, and Pitfalls of “Reconstructing” Places of the Past*

At the turn of the century, the city of Tucson, Arizona, started an effort at a “kinder and gentler” approach to urban renewal by attempting to utilize the regional archaeological research to reclaim a long neglected and decidedly non-Anglo chapter of the community’s past. Archaeological research was funded to provide the information needed to re-create public architecture from the community’s Hispanic and Native American heritage, in the context of an ambitious plan for a new museum campus. The project was called Rio Nuevo, in the hopes of restoring the public imagination of city’s heritage along the Santa Cruz River or the “río antigua” within the Tucson Basin. The project successfully sponsored important archaeological research on the community’s ancient and historical roots, but a lack of clear leadership, inept project management, and conflicts over the nature and ethics of the reconstruction of heritage sites would serve to derail the project’s lofty intentions. Two less ambitious heritage sites were partially reconstructed, but the centerpiece of the reconstructions at the location of the city’s original “birthplace,” as well as the museum complex, were derailed. This presentation will share lessons learned from the debates over reconstruction in practice and principle.

Garate, Diego [28] see Chanteraud, Claire

**Garay Herrera, Alejandro (Universität Bonn)**

[52]

*Rituals of Maya Royal Women in Classic Period Inscriptions*

Classic Maya period inscriptions provide us with extensive documentation of the rituals and ceremonies that Maya elites performed as part of their royal duties. Throughout this paper we will discuss those that were overseen by women belonging to the royal houses of the polities of the Maya lowlands, which have been recorded through the images and inscriptions on the stone monuments of that time. From the reading of the inscriptions that describe them, the role that women hold in these performances in front of the supernatural world will be analyzed, making analogies with the role that Maya women hold up until today, supported when possible by archaeological data.

Garcia, Albert [224] see Knell, Edward

Garcia, Chris [181] see Duwe, Samuel

Garcia, Dominique [252] see Colleter, Rozenn

García, Everett [181] see Duwe, Samuel

**García Barrios, Ana (Universidad Rey Juan Carlos)**

[238]

*De la mano de Michael Coe a las manos de los artistas estilo códice: Cincuenta años de estudios*

The Grolier exhibition commissioned by M. Coe in 1973 came to researchers as an inescapable reference that remains today. His studies on codex-style vessels, so defined by him, opened the door to new studies from different perspectives and approaches that are reviewed here. This study revolves around two main aspects. On the one hand, the findings of the last decades in the political environment of Calakmul are presented. On the other hand, and from an art history perspective, we are interested in reviewing the themes and their relationship with the support, as well as the style, technique, composition, and even the light used by the masters of the codex style to create the scenes.

García Barrios, Ana [52] see Vega-Villalobos, Maria Elena

García Basto, Jaqueline [58] see Goudiaby, Hemmamuthé

**García-Des Lauriers, Claudia (California State Polytechnic University, Pomona)**

[52]

*Women and Ritual at Teotihuacan, Mexico*

Teotihuacan is a complex multiethnic urban metropolis whose history is slowly becoming more nuanced after more than 100 years of research. Despite the recent attention that this Mesoamerican city has received, we still have many questions, among them, about the role of women, their life histories, their identities, and their role in the ritual life of the city. Recent work has looked at figurines and funerary analysis, centering a better understanding of gender identities at the site. In this paper, I would like to draw on those studies but also provide a discussion of the intersection of women, hierarchy, and ethnicity in the ritual life of Teotihuacan during the Early Classic. I hope to interrogate the complexities of gender construction at this important city.

García-Des Lauriers, Claudia [92] see Livingston, Christina

García Ferrusca, Hugo [74] see Larrick, Dakota

**García-Piquer, Albert (Autonomous University of Barcelona)**

[92]

*Chair*

**García-Piquer, Albert (Autonomous University of Barcelona) and Colin Grier (Washington State University)**

[92]

*Navigating Paradigms: Site Location and Settlement Patterns in Watery Environments from the Pacific Northwest Coast and Southern Patagonia*

Reconstructing past seafaring presents major challenges. Beyond the archaeological invisibility of watercraft, a key issue is that theoretical models and archaeological predictions concerning aquatic movement are less developed than for terrestrial cases. We apply an explorative and comparative approach to analyzing different watery spaces along the Northwest Coast of North America and the Fuego-Patagonian archipelago of southern South America. Five study cases are mobilized, three on the Northwest Coast (Chinook, Coast Salish, Tsimshian) and two in Fuego-Patagonia (Kawésqar, Yámana). The dataset represents watery environments ranging from rugged to uniform coastlines, from inland to open sea areas, and is also diverse in

social and technological respects. They represent different paradigms of hunter-fisher-gatherer social and organizational strategies, including different watercraft technology (e.g., dugout, bark canoe). GIS-based and learning machine methods are applied to the archaeological and ethnographic data to evaluate to what extent site location decisions, settlement patterns, and group interaction in each scenario were driven by environmental versus other factors. This initial study of the two regions and their respective internal variation offers the opportunity to consider how environment, seafaring, and social strategies interacted to produce local and regional histories.

Garcia-Piquer, Albert [92] see Aguilera, Nelson

**Garcia Zaldúa, Johan (University of Kent; Universidade do Porto)**

[13]

*Spanish Empire Dynamics, Early Globalization, and Copper Production in Early Colonial Mexico (1522–1648)*

When the Spanish conquistadors arrived in Mesoamerica, they found a well-developed metallurgical tradition based on copper and copper-based alloys. With an increasing demand for copper and an almost complete lack of copper extractive knowledge, the Spaniards relied on indigenous labor and specialized metallurgical know-how to provide the newly founded New Spain with all the necessary copper demanded by the colonial expansion. This was a metal of exceptional importance used extensively for artillery making and coinage, but whose local production in considerable quantities and at a relatively low price also facilitated the development of some of the most important economic activities in New Spain, such as silver and sugar production. However, this hybrid Indigenous-Spanish production was deeply influenced by the global expansion of the Spanish Empire, and the recurrent armed conflicts in which Spain was immersed defined the social and technological characteristics and the political economy of its production. This presentation analyses the development of early colonial Mexican copper production within the context of expansion and conflict in the Spanish Empire.

**Gardner, A. Dudley (Western Anthropological and Archaeological Research Institute)**

[249]

*Chair*

**Gardner, A. Dudley (Western Anthropological and Archaeological Research Institute)**

[249]

*Excavation and Restoration of a Fremont Granary in Northwest Colorado*

We were commissioned to restore a granary constructed circa 900 AD south of the White River in Northwest Colorado. Restoration involved removing cliff fall debris, excavating the granary, and then restoring the walls that had collapsed. In the process of excavating, we learned how the granary was built, what went into its construction, and how it was reinforced. We also learned how Formative period builders in Northwest Colorado cut the wood that they used to make the roofs of their granaries. What we will present is a description of how granaries were constructed in the upper Colorado Plateau between 900 and 1100 AD. We will briefly describe the maize stored in the granary and compare our findings with other granaries in the Colorado River Basin.

**Garland, Carey (University of Georgia), Victor Thompson (University of Georgia), Ted Gragson (University of Georgia), Marcela Demyan (University of Georgia) and Brett Parbus (University of Georgia)**

[113]

*New Evidence from the Hokfv-Mocvse Shell Ring (5000–4800 cal BP) on the Emergence of Ring Sites on the South Atlantic Coast*

Circular and arcuate shell rings along the South Atlantic coasts are the vestiges of some of the earliest known villages in North America. Most rings date to the Late Archaic period (5000–3000 BP) and are often

associated with early pottery production, providing important insights into Indigenous economies, ceremonialism, cooperation, and collective action in the context of environmental change. However, little is known about when Indigenous communities first colonized the barrier islands or began constructing shell rings as habitation sites. We present data from the newly (re)discovered Hokfv-Mocvse (Muskogean for “new seashell”) Shell Ring located at Bluff Field on Ossabaw Island, Georgia. No ceramics were encountered in recent excavations at the site and the only material culture recovered were quartz stemmed projectile points, similar to points found over 100 miles inland. A Bayesian model of radiocarbon dates from multiple contexts at the site indicate that the shell ring was occupied between 5090 and 4740 cal BP (95% confidence), making it the earliest securely dated ring in the region. The Hokfv-Mocvse Shell Ring thus provides evidence and insight into the colonization and earliest occupation of Georgia’s barrier islands by Indigenous peoples.

Garland, Carey [70] see Demyan, Marcela

**Garnett, Justin (University of Kansas)**

[69]

*3D Printing for Lithic Artifact Replication: Assessing Affordable Options*

Computer controlled additive manufacturing (3D printing) shows great potential for experimental archaeology, particularly lithics experimentation. As demonstrated by pioneering works in the current literature, 3D models of lithic artifacts can be printed to enable mold making and replication in porcelain, with far lower labor investment than through conventional flintknapping. However, as potentially useful as 3D printing is for duplicating lithics, it is also potentially expensive and can be finicky to operate. This research explores 3D printing as a means for creating replica projectile points for ballistics experimentation. Points were printed on a variety of inexpensive 3D printers, some of which were operated by trained technicians. SLA (Stereolithography) was found to produce better results than FDM (Fused Deposition Modeling). SLA models printed faster, at higher resolution, and with less cleanup of completed models required. In contrast to the high prices of the printing equipment described in the current literature, inexpensive SLA printers using UV curing resin were found to be capable of producing sufficiently detailed prints for our purposes.

Garrido Lopez, Jose Luis [64] see Le Moine, Jean-Baptiste

**Garrison, Thomas (University of Texas, Austin)**

[186]

*Discussant*

[236]

*Chair*

**Garrison, Thomas (University of Texas, Austin) and Stephen Houston (Brown University)**

[236]

*La Cuernavilla, Guatemala: A Fortress and Its Environs*

La Cuernavilla is a recently discovered Classic Maya fortress in the central Petén of Guatemala. Situated between the major ancient kingdom of Tikal and the minor city-state capital of El Zotz, the site has a complex history tied into the broader geopolitics of the Buenavista Valley, which it overlooks. This talk introduces the archaeology of La Cuernavilla from its 2017 discovery using lidar, through its intensive excavation during the 2021 and 2022 field seasons. The research at La Cuernavilla takes a landscape approach to understanding the citadel, drawing on broad geographical analyses of regional settlement and environmental data as well as the results from intensive excavations at the site. Introduced here is the complex occupation and construction history of La Cuernavilla’s two fortified hilltops. Originally settled in the Middle Preclassic, the site grew in importance as a refuge during the troubled first centuries CE. Following the 378 CE Teotihuacan entrada, La Cuernavilla was transformed into a major fortress as the Tikal state consolidated local power in the Buenavista Valley. Abandoned toward the end of the Early Classic,

there were unfulfilled efforts to rehabilitate the fortress in the Late Classic before the site was abandoned and taken over by the jungle.

Garrison, Thomas [236] see Baldwin, J. Dennis

Garrison, Thomas [54] see Character, Leila

Garrison, Thomas [236] see Landa, Yesenia

### **Garvey, Raven (University of Michigan)**

**[88]**

*Interpreting Coefficients of Variation in Archaeological Assessments of Cultural Transmission*

To test hypothesized effects of cultural transmission on material cultural evolution, archaeologists primarily use the coefficient of variation (CV). Interpretation of archaeological CVs is necessarily comparative, and foundational papers have assessed variation across broad geographic regions, and relative to either theoretically-derived threshold CVs or computer-simulated “comparative collections.” Each approach has contributed to our understanding of both cultural transmission effects on material culture and CV as a means of quantifying these effects but, as this study shows, very different transmission scenarios can result in identical CVs. Here, I demonstrate near-identical CVs among projectile points produced by a single, highly skilled traditional knapper and points produced by many individuals over the course of 100 years at a site in the US Southwest. However, additional statistical analyses and a series of simulations show that, despite their symmetry and fine flaking, the individual’s points appear to have been produced randomly with respect to particular attribute values. Conversely, the Southwest points’ high degree of standardization may be a result of strong transmission biases. These results indicate that if CV is to remain the primary metric in the archaeological assessment of cultural transmission, we must further refine the approach, as through the simulation studies presented here.

Garza Roldan, Melvin Elisandro [249] see Wood, Richard

### **Gasco, Janine (CSU-Dominguez Hills)**

**[164]**

*A Lifetime of Fieldwork*

Although Jerry is best known for his archaeological work in the Andes over the past 40 years, his interest in anthropology and in conducting fieldwork began much earlier as a high school student in Stockton, California. Initially intrigued by visits to museums, he set out to learn about Native Americans in the nearby Sierras, and his interests soon expanded to California archaeology. As an undergraduate at Cal State Stanislaus, a professor involved in CRM provided students with numerous opportunities to carry out archaeological fieldwork. As a graduate student at UCSB, Jerry’s interests became broader and included planned research in Baja California and in Southeast Asia. But in 1982, he was invited by Carol Mackey and Ulana Klymyshyn to join an archaeological project in Casma, Peru. Since then, Jerry’s principal focus has been on various archaeological projects in the Andes, but he has always maintained his broader interests in ethnographic and historical research in the Andes and in other regions of the Americas. Throughout his decades at CSUDH his teaching and training of students have always taken very broad perspectives. This breadth and his varied experiences have made Jerry an extraordinarily effective and productive scholar and teacher.

### **Gasimov, Aslan (Junior Research Fellow)**

**[161]**

*Barda in the Transition Stage from Late Antiquity to Islamic Archaeology: Historical and Archaeological Review*

The city of Barda was especially notable due to its political and economic position in the Caucasus in the Middle Ages. In addition to being the capital of the Albanian state, it was the center of the local administration of the Sassanid Empire and later of the Arab Caliphate. Middle Ages sources inform about Barda, calling it the mother of Arran and comparing it with the central cities of Iraq and Iran. The analysis of

historical sources as well as archaeological materials prove that there was a large urban center here. Research carried out by the Oxford University Nizami center in 2015–2018 revealed interesting results. Construction remains, glazed and unglazed ceramics, metal, glass and bone decorations, and household items have been unearthed. Artifacts study allows us to remark new ideas about the Middle Ages Barda. Thus, the city of Barda, formed in Late Antiquity, transitioned to Islamic culture after the Arab invasion, and as a result, retained the traces of the two civilizations. The study of Barda allows us to follow the transitional phase and see the changes that occurred in architecture, ceramics, etc. Using absolute dating methods enables us to shape accurate ideas related to the topic.

**Gasparyan, Boris (Institute of Archaeology and Ethnography, Armenia), Keith Wilkinson, Ellery Frahm (Yale University), Jenni Sherriff (King's College London) and Daniel Adler (University of Connecticut)**

[56]

*Nor Geghi-I and the Process of Late Middle Pleistocene Technological Evolution in the Armenia Highlands*

Current data from Africa and Eurasia suggest that the intercontinental transition from bifacial to hierarchical core technology occurred independently within different geographically dispersed hominin populations already adept at a variety of complex knapping procedures inherent to the Acheulean. The episodic appearance and disappearance of Levallois technology throughout Africa and Eurasia during the Late Middle Pleistocene (LMP) suggests that interregional technological homoplasy, based on a shared Acheulean ancestry, is the crucial factor underwriting the eventual transition to the Middle Stone Age and Middle Paleolithic. If population expansion from Africa were the primary mechanism driving the appearance and spread of Levallois, then assemblages with strong operational links to the preceding Acheulean or a fluctuating spatiotemporal pattern of technological evolution would not be expected outside Africa. As one of the only LMP sites located in a known region of Plio-Pleistocene demographic expansion (Armenian Highlands), and associated with rich behavioral, paleoenvironmental, and chronometric archives, Nor Geghi-I (NG-I) provides a rare opportunity to investigate technological continuity and change on an evolutionarily significant timescale and at spatiotemporal levels of detail previously unprecedented outside East Africa. Research at NGI helps to clarify the relationship between the evolution of lithic technology, hominin behavioral variability, and demographic change.

Gasparyan, Boris [56] see Adler, Daniel

Gasparyan, Boris [56] see Glauberman, Phil

Gasparyan, Boris [56] see Haydosyan, Hayk

Gasparyan, Boris [56] see Kandel, Andrew

Gasparyan, Boris [56] see Sherriff, Jenni

**Gastelum-Strozzi, Alfonso (UNAM), Yira Castro-García (Hospital General de Mexico), Ernesto Dena (Hospital General de Mexico), Jose Damian Carrillo (Hospital General de Mexico) and José Luis Punzo Díaz (INAH-Morelia)**

[200]

*Implementation of Pore-Space Surface Descriptors for the Characterization of Taphonomy and Pathological Changes on Temporal Bones*

This study describes the techniques developed to obtain a set of 2D/3D surface and volume descriptors from photogrammetry and tomography datasets that evaluate the pore space presented in a collection of temporal bones from Tzintzuntzan, Mexico. These methods could help to distinguish between taphonomy and pathological changes of the bone structure and the pores that could be related to otitis and mastoiditis lesions. The pores are modifications presented in diverse ranges of size, distribution, quantity, and localization. The parameters obtained per pore were curvature, area, perimeter, kurtosis, circularity over the surface, pore cylindrical factor, and pore central tortuosity. Also, group measurements of multiple pores were obtained, the distribution of the pores over and area, the clustering characteristics of the different groups of pores, and the geodesic distances between their centers. Three levels of characterizations are obtained, at the individual pore level, at each cluster, and finally the overall distribution in each bone. Finally, a

three-hierarchy method is used to classify the bones and obtained clusters of bones with similar values at all levels. The method was used to analyze 41 temporal bones and the results are presented.

Gastelum-Strozzi, Alfonso [200] see Ávila, Claudia

Gastelum-Strozzi, Alfonso [200] see Budziszewski, Adam

Gastelum-Strozzi, Alfonso [200] see Ibarra López, Miguel

**Gaugler, Kristina (Carnegie Museum of Natural History)**

[187]

*Discussant*

Gaugler, Kristina [239] see Homsey-Messer, Lara

**Gauthier, Nicolas (Florida Museum of Natural History, University of Florida)**

[137]

*Integrating Archaeological Models and Data with Bayesian Data Assimilation*

Archaeological data are crucial for understanding how human societies shaped—and were shaped by—their biophysical environments. Yet these data are often sparse, noisy, and time averaged, making it difficult to uncover patterns of change across space and time. Process-based simulations are one way to fill the gaps in these imperfect proxy records, but they too require data for calibration and validation that are often lacking. Here I discuss how data assimilation, a Bayesian model-data integration approach used in engineering, meteorology, and other fields that work with imperfectly sampled complex systems, can be applied to the archaeological record. In data assimilation, an ensemble of simulation outputs serves as a Bayesian prior for the possible states of a past socioecological system and the uncertainty in its observation. I show how updating this simulated prior with real archaeological and paleoenvironmental data yields spatially explicit, multivariate reconstructions of past climate and demography. Any variable in the simulated prior can be reconstructed with this approach, as it leverages the internal consistency of the simulation to “spread out” information from the sparse proxy records. Crucially, this Bayesian approach to model-data integration enables a full accounting of uncertainty, helping target future research efforts that optimally reduce this uncertainty.

**Gaylord, Donald (Washington and Lee University)**

[69]

*Spatial Sampling and Interpretation of Building Sites at Liberty Hall*

People have impacted the Liberty Hall landscape for thousands of years, though with the greatest intensity between 1782 and the American Civil War. During this time the majority of people who lived here were held captive and forced into agricultural, light industrial, and infrastructural labor by elite enslavers closely tied to Washington and Lee University and its predecessor institutions. Since the 1970s, the university has tried to re-imagine this landscape to include important historical interpretation of these sites, but within the context of greater and greater impact by the University’s present-day needs. This poster continues the work started by Professor John McDaniel and his students 50 years ago to re-imagine the past landscapes of Liberty Hall. We do this here with an expanded understanding of who shaped these historic cultural landscapes, and through digitally modeled 3D rendering that represents the best of our understanding from historical documents, archaeological excavation, and oral histories.

**Gazzo, Silvia (University of Genoa), Fabio Negrino (University of Genoa) and Julien Riel-Salvatore (Université de Montréal)**

[87]

*The Use of Shells as Personal Ornaments in Liguria during the Upper Paleolithic: A Review*

Personal ornaments are commonly attributed to a modern human dispersal in western Asia and Europe,

representing a veritable key tool for understanding the human dispersal out of Africa. Objects loaded with symbolic meaning such as beads made from modified marine shells were largely used during the Upper Paleolithic in Liguria, a region located in northwest Italy. The finds are mainly concentrated in the western area of the region, where several Gravettian and Epigravettian burials were found during different field campaigns since the nineteenth century. Here we review what is known about the Balzi Rossi archaeological complex (Ventimiglia, Imperia) and the Arene Candide cave (Finale Ligure, Savona), where a very rich array of grave goods and body ornaments made from perforated marine shells were associated with the Paleolithic burials. A wide variety of shells belonging to species very different in shape and size were exploited over time and space, suggesting the existence of trends developed within hunter-gatherer groups. From a diachronic perspective, the analysis and the reanalysis of these objects may provide important information about the evolution of human personal ornamentation during the Late Pleistocene in Liguria, highlighting similarities and differences between the assemblages.

**Geib, Phil (University of Nebraska, Lincoln) and Laurie Webster (University of Arizona)**

**[246]**

*Weaving Ancestors into Everyday Objects: Basketmaker II Use of Human Hair*

Pre-pottery farmers on the Colorado Plateau of the North American Southwest known as Basketmakers fabricated various artifacts using human hair cordage. The textiles made of this material ranged from intimate personal adornments to utilitarian rabbit nets and load-bearing tumplines. Aside from important functional properties of elasticity and strength, hair has symbolic and sentimental connotations when it comes from departed family members. Human hair is not simply a handy functional alternative to making cordage with plant fibers. We report non-contemporaneous radiocarbon dates on cordage from three textiles that are consistent with weaving using intergenerational or heirloom hair. The dated cords have construction differences indicative of separate hands in spinning and plying. Human hair collected mainly from females likely had significant social ramifications related to memory of ancestors and enlisting their help in life.

**Geiger, Elspeth (University of Michigan)**

**[140]**

*The Spirit from the Seed: New Microfossil Evidence of Wild Rice in the Upper Great Lakes*

Within the Great Lakes and the Northeastern United States, microfossil research has primarily focused on maize (*Zea mays*). Further, direct evidence of starch beyond maize is equally limited. The importance of wild rice (*Manoomin*) as a food source, an aspect of spirituality, and other-than-human being is well known to the archaeologists of the region. However, the amount of archaeological evidence of wild rice use has yet to catch up to its well-known sister. Now, microfossil evidence of wild rice, particularly rice starch from the multicomponent Cloudman site, can contribute to the growing interest in the subject. More data of the sort may provide an opportunity to better understand production and processing activities across and between sites. Additionally, the revitalization of indigenous wild rice and food sovereignty has grown exponentially in the last few years. As the Upper Peninsula of Michigan becomes a focal point of re-seeding efforts of *Manoomin* among Anishinaabe groups, Michigan, in particular the St. Mary's River, is a promising area for new rice stands. Starch and other microfossil data may be able to contribute to that growing movement.

Gelabert, Pere [214] see Tejero, José-Miguel

**Geller, Pamela (University of Miami)**

**[110]**

*Discussant*

**Gembicki, Maciej (University of Adam Mickiewicz, Poznan, Poland)**

**[251]**

*Chair*

**Gembicki, Maciej (University of Adam Mickiewicz, Poznan, Poland), Marcin Krzepakowski (Museum of Wagrowiec, Poland) and Joanna Wysocka (Polish Academy of Sciences, Poland)**  
[251]

*Mortuary Practices of the Vanished Medieval Village of Gać in Poland*

This paper is focused on the results of three seasons of archaeological excavation in the vanished village of Gać, located in the central part of Greater Poland. More than 300 m<sup>2</sup> of the medieval cemetery were examined, revealing 159 burials. The vast majority of the dead were buried according to the Catholic rite. However, a few deviated significantly from it. These graves had extra skulls placed in the pelvic area. Their late dating suggests that the funeral rite may have changed after the liquidation of the parish. An important discovery was finding the physical boundary of the cemetery in the form of a ditch. This will allow the identification of social outcasts located beyond the holy ground or representatives of the lower social classes buried near the border. The cemetery has traces of looting. The location of looting trenches indicates that the robbing of graves took place when they were still visible on the surface. However, due to the general lack of valuables within the cemetery, we believe the robber's targets were human remains. Even partial results show that the burial ground in Gać may be significant for a better understanding of the life of the Polish serfs.

**Genord, Kayla, Kaitlyn Davis (PaleoWest), Olivia Sage Grunewald (PaleoWest), Breeanna Charolla (PaleoWest) and Alan Salacain (PaleoWest)**

[201]

*A Class III Cultural Resource Inventory of Travel Routes on Island Mesa in Montrose and San Miguel Counties, Colorado*

In this poster, we present the findings of PaleoWest's Class III survey of Island Mesa in Montrose and San Miguel Counties of Colorado at the end of the 2021 field season. This project posed challenges in access and interpretation because the survey area was located on a steep, rugged mesa and the project area was considered a lithic landscape where historic inhabitants had engaged with and altered prehistoric sites. Transportation around the majority of the project area required the field crew to utilize "unconventional" modes of transportation, including electric mountain bikes. Additional challenges were faced during recording and interpretation of archaeological finds which resulted in the crew needing to develop a time-efficient way to document the dense lithic areas and carefully examining multicomponent sites to distinguish historic mining and hunting impacts on prehistoric resources. For example, a ceramic "collector's" pile was found at a site as well as an array of lithic tools and flakes indicating likely presence of Ancestral Puebloans in the area. PaleoWest also recorded a variety of historic artifacts and a mine at this site indicating probable disturbance by historic miners that occupied the area in the early-mid 1900s.

**George, Miranda (University of Calgary), Elizabeth Paris (University of Calgary) and Roberto López Bravo (INAH)**

[218]

*A Novel Approach to the Identification of Dog Breeds in Highland Chiapas, Mexico*

The utilization of dental morphology for the identification of different dog breeds in archaeological contexts has recently emerged as a promising new avenue for zooarchaeological methodologies, particularly in cases differentiating between coated and hairless breeds. Recent zooarchaeological studies from the Early Postclassic period (ca. AD 1000) site of Moxviquil in Chiapas, Mexico, placed the ancient hairless Xoloitzcuintli breed in the Mexican highlands for the first time based on observable dental anomalies tied to the hairless condition. The Xolo presents a diagnostic dental phenotype, Canine Ectodermal Dysplasia, that is characterized by missing permanent maxillary and mandibular premolars and reduced cusp numbers on other molar teeth—a genetic condition resulting from a mutation on the FOXI3 gene, which codes for the development of the jaw, teeth, inner ear, and hair. The present study outlines a novel approach utilizing photomicrographs and MicroCT scan landmark studies in addition to standard morphometrics and comparative samples to establish a series of landmarks on canid dental elements useful for differentiating archaeological dogs in the Maya area to breed level. It incorporates scanned elements from the Moxviquil sample with new specimens from the site of Tenam Puente, another highland Early Postclassic settlement.

**George, Richard (University of California, Santa Barbara), Christopher Schwartz (EPG, Arizona State University), Stephen Plog (University of Virginia), Patricia Gilman (University of Oklahoma) and Douglas Kennett (University of California, Santa Barbara)**

[48]

*Scarlet Macaw Avicultural Dynamics in Southern Arizona*

Our understanding of scarlet macaw aviculture throughout the southwestern United States has greatly benefited from recent methodological advances, leading to new discoveries in regional management dynamics, breeding regimes, and exchange networks between the ninth and the fifteenth centuries. These studies have mainly focused on specimens from Chaco Canyon and the Mimbres region in the southwest United States, and Paquime in the Mexican northwest, leaving a gap in our understanding of macaw aviculture at sites and time periods associated with southern Arizona. Here we summarize the current state of scarlet macaw (*Ara macao cyanoptera*) research and report results from new isotopic, radiocarbon, and paleogenomic analyses to examine the dynamics of aviculture in this region through time.

George, Richard [218] see Noe, Sarah

**Georges, Jemima (The Graduate Center CUNY)**

[84]

*Fauna from Sinkholes at the Site of Nixtun-Ch'ich'*

The Petén Lakes region of Petén, Guatemala, sits on karst bedrock and is home to a series of lake chains, the largest of which is Lake Petén Itzá. Nixtun-Ch'ich' lies on the lake's western arm. The lowland's limestone topography allows for high drainability of water resulting in scarce surface hydrology. Aside from the few lakes and streams in the Central Lowlands, ancient inhabitants also relied on sinkholes (*aguadas*) as sources of water and for ritual use. This presentation involves a summary of recently analyzed animal bones recovered from Nixtun-Ch'ich''s *aguadas* and outlines their cultural significance during the Preclassic period. At the time of incipient social complexity, residents at Nixtun-Ch'ich' relied on social events such as feasting to foment social bonds between local people and outside visitors. The discussion of faunal material also assists in understanding the ecological properties of sinkholes.

**Georgouses, Blake (San Diego State University)**

[70]

*A Faunal Analysis of 10 Years of Excavation of the Rancho Penasquitos Adobe Site: SDI-5220/SDI-8125H*

[WITHDRAWN]

**Gerard, Paul (University of Oregon), Mark Tveskov (Southern Oregon University) and Scott Fitzpatrick (University of Oregon)**

[74]

*Establishing a Chronology for the Fort Point Site (35CU11) along the Southern Oregon Coast*

Fort Point (35-CU-11) is a precontact midden located on a marine terrace overlooking an important natural and historical feature known as Battle Rock along the southern Oregon Coast. Field investigation that took place in 2019 along the main promontory of the site revealed dense midden deposits that provide useful data on subsistence and residential patterns which were largely focused around semipermanent villages situated along estuaries, the outer coast, and the main stems of the region's larger rivers. As part of the preliminary stage of our investigation, we report on the first radiocarbon dates from this project, compare these with previously recovered data from the East Locus of the site, and contextualize our findings with what is currently known from other Late Holocene sites in the region.

**Gerlach, Ally (University of Idaho)**

[185]

*Public Archaeology at Iosepa: Community Collaboration in Artifact Display and Analysis*

Public archaeology is being increasingly practiced. Goals of this practice include creating accessibility beyond

academia and placing an increased emphasis on archaeology with interpretations and benefits for indigenous, stakeholder, and descendant communities. This paper examines the steps taken to engage in public archaeology through artifact display and analysis as requested by the descendant community of Iosepa, a late nineteenth to early twentieth-century Hawaiian and Polynesian settlement site established by the Church of Jesus Christ of Latter-day Saints in Skull Valley, Utah. The objective of this research is to identify aspects of public archaeology in relation to specific stakeholder wishes, thus characterizing the strategies necessary to deliver satisfactory involvement and analysis opportunities. Through this, increased stakeholder, indigenous, and descendant community understanding of archaeology as a process, as well as connection to and representation of their own past and, thereby, their future, is established.

**Ghaheri, Fatemeh****[235]***Chair***Ghaheri, Fatemeh****[235]***Food, Agricultural, and Environmental Risk Management during the Holocene in Mesopotamia*

Using new microbotanical phytolith evidence, this article discusses what strategies were implemented to manage factors affecting agricultural strategies and staple food during the Late Holocene in a dry climatic condition in the Late Holocene at the Neo-Assyrian large site of Peshdar Plain located in Kurdistan, Iraq, Northern Mesopotamia. Located in the northern Fertile Crescent, the Neo-Assyrian in land provincials experienced constant climatic changes driving people to develop skills for the time of predictable and abrupt changes. These management skills in terms of agriculture and risk management are still poorly understood and the phytolith studies are rich data to fill this gap. The phytolith evidence suggest that diversification of land, environments, and plants, use of storage, rainfed and local irrigation were some of the most important employed methods to manage agricultural risks.

**Ghargich, Melissa****[145]***A Synchronic Perspective of Early Holocene Occupation at the Cooper's Ferry Site in Western Idaho*

The Cooper's Ferry Site (10IH73) in western Idaho provides a unique synchronic perspective into the lives of the Western Stemmed Tradition (WST) people in the late Pleistocene/early Holocene period. Pit cache features previously excavated at the site provide key information and reliable dates to inform the understanding of the lifeways of individuals who occupied the lower Salmon River canyon. Pit Feature III, in Area B of the Cooper's Ferry site, has been dated to  $\sim 9505 \pm 38$  BP (10,827–10,653 cal yr BP) and contains an assemblage of WST projectile points, various lithic tools, debitage, and faunal remains. My morphometric analysis of the WST points from the pit feature reveal details about the blade and hafting characteristics of early Holocene stemmed points. Analysis of the lithic debitage and faunal remains within the pit feature will provide further information on subsistence strategies and technological pattern from this period. I will compare the FIII assemblage to other early pit features from the Cooper's Ferry site, providing an understanding of how technologies are learned, shared, and adapted over time.

Ghislandi, Sabina [87] see Rellini, Ivano

Gibbs, Tim [45] see Smith, Micah

**Gibson, Wesley****[250]***Stream Network Analysis in Archaeological Predictive Modeling*

In this research, I explore the efficacy of stream network analysis as a dataset to use in archaeological

predictive modeling. Stream network analysis allows the researcher to use a digital elevation model (DEM) to create a geographic information system (GIS) layer representing stream channels in a study area. Stream network analysis can also be used to assign stream order designations to differentiate channels based on the amount of flow in a channel. Stream network analysis allows a researcher to take an opensource GIS resource available online and determine where all of the drainages are and their relative size in a study area. Because distance to water is critical to archaeological predictive modeling, stream network analysis represents a powerful tool in the modeler's toolbox. I compare several maximum entropy models using different layers created with stream network analysis to a maximum entropy model without those layers. Other environmental data used in the research include standard datasets used extensively in predictive modeling throughout the world. This research discusses the process of creating the stream network analysis data and how these data affect the predictive models researchers create.

**Giersz, Milosz (University of Warsaw)**

[139]

*Discussant*

[139]

*Chair*

**Giersz, Milosz (University of Warsaw), Alan Hogg (University of Waikato) and Branden Rizzuto (University of Toronto)**

[139]

*The Absolute Chronology of Castillo de Huarmey*

Castillo de Huarmey, located on the North Coast of Peru and dated to the Middle Horizon period (ca. 650–1050 CE), was one of the most important provincial centers of the Wari Empire. Presenting the results of an extensive radiocarbon dating program, the present paper focuses on the chronological aspects of this unique site. Based on precise stratigraphic control of the radiocarbon samples, we implement a Bayesian statistical analysis of the radiocarbon dates from Castillo de Huarmey to estimate the site's occupation period and to define episodes of human activity and architectural dynamics registered during archaeological excavations.

Giersz, Milosz [139] see Knobloch, Patricia

Gifford, Chad [57] see Connell, Samuel

Gilbert, Steven [102] see Hansen, David

Gilheany, Emma [14] see Matthews, Christopher

**Gill, Jayson (University of Connecticut)**

[56]

*Chair*

**Gill, Jayson (University of Connecticut), Daniel Adler (University of Connecticut), Jenni Sherriff (Kings College), Keith Wilkinson (University of Winchester) and Hayk Haydosyan (Institute of Archaeology and Ethnography, National)**

[56]

*Ptghavan-4: A Middle Paleolithic Open-Air Site in the Debed River Gorge, Armenia*

The recently excavated site of Ptghavan-4 in the Armenian Highlands provides rare data on Middle Paleolithic hominin behaviors during the early Upper Pleistocene. The site contains a dense accumulation of lithic

artifacts that are Middle Paleolithic in character within a pedogenically modified aeolian deposit, which has been dated to MIS 5e/d. Currently, only two Middle Paleolithic sites in this region, Alapars-1 and Hovk-1, have deposits dating to Stage 5, both of which have a low find density. Here results from the 2019/2022 field seasons and initial lithic analysis are reported. The technotypological composition of Ptghavan-4 is compared to dated Middle Paleolithic sites in the Armenian Highlands to understand how it might relate to regional technological sequences. Ongoing and future geological, chronometric, and archaeological work at the site will allow us to test hypotheses on both local and interregional hominin behavioral dynamics. Further, the site has potential for exploring both older and younger behavioral periods through newly discovered artifact horizons both below and above the main Middle Paleolithic artifact-bearing deposits.

**Gillam, J. Christopher (Winthrop University), Nicolas Zwyns (University of California, Davis), Masami Izuho (Tokyo Metropolitan University), Byambaa Gunchinsuren (Institute of Archaeology, Mongolian Academy of Sciences) and Brent Woodfill (Winthrop University)**  
[55]

*Falconing the Paleolithic: High-Resolution Aerial Mapping of Northern Mongolian Upper Paleolithic Sites and Landscapes*

This paper will discuss the use of high-resolution aerial drone mapping to better understand the cultural landscape, complex geomorphology, and site formation processes in the northern Mongolia's mountainous forest-steppe environment. In recent years, pedestrian surveys of the Tolbor River (Ikh Tulberiin Gol) and neighboring tributaries (Naryn Tulberiin, Khargany, Altatyn) of the greater Selenge River Basin have yielded 95 Upper Paleolithic open-air sites. Excavations at six sites documented 45,000 years of human occupation in the region. Beginning in 2011, efforts to document and characterize the greater Paleolithic landscape used Global Positioning Systems (GPS) mapping of new and previously documented sites, and developed a geographic information systems (GIS) database with base layers from Shuttle Radar Topography Mission (SRTM) 30-m and 90-m resolution Digital Elevation Models (DEMs). Recent high-resolution aerial maps heighten our understanding of the complex landscape in this region.

**Gillespie, Jeanne**  
[247]

*Saints as Warriors: Tlaxcalteca and Cholulteca "Smack Talk" during the Siege of Cholula*

In the *Historia de Tlaxcala*, mestizo chronicler Diego Muñoz de Camargo commemorates the first significant military endeavor between Tlaxcalan forces and the European soldiers under the command of Hernán Cortés. This study analyzes how Muñoz Camargo constructed the narrative of the siege and battle, and how he framed the Tlaxcalan victory as a cosmological event. Muñoz Camargo narrates the Tlaxcalan efforts against the Cholulteca from a Christian perspective. However, he also discusses the tutelary divinities invoked by each side. In Mesoamerican cosmology, Quetzalcoatl and Tezcatlipoca faced off in violent conflicts during the era of the creation of the Five Suns. Along with Tlaloc, the rain divinity, and Tlaltecuhli, the earth lord, they were responsible for the creations and destructions of the first four suns and were present at the creation of the fifth sun, Nahui Ollin. During Nahui Ollin, Tezcatlipoca cults rose in many altepeme, although Cholula manifested a veneration of Quetzalcoatl. The Tlaxcalans served Mixcóatl-Camaxtli also known as Red Tezcatlipoca. In addition, the arrival of the Christians in Mesoamerica added a new divinity to military endeavors. Muñoz Camargo recorded conversations between Cholula and Tlaxcala about the power of the divinities they served.

Gilman, Patricia [48] see Dolan, Sean

Gilman, Patricia [48] see George, Richard

Gilman, Patricia [199] see Whisenhunt, Mary

**Gilmore, Eric, Jonathan Dombrosky (Crow Canyon Archaeological Center), Lisa Nagaoka (University of North Texas) and Steve Wolverton (University of North Texas)**  
[218]

*Welcome to the Machine: New Techniques in Predictive Modeling for Improving Data Quality in Zooarchaeology*

Taxonomic identification is a key goal of faunal analysis, but few controls are in place to ensure data quality. Comparative collections and identification guides offer valuable information; however, the validity of faunal identification can be questioned without assessing each feature's utility for differentiating taxa. Analysis of biometric data allows zooarchaeologists to evaluate criteria from identification guides. This study evaluates well-known criteria for distinguishing tarsals of deer (genus *Odocoileus*) from pronghorn (*Antilocapra americana*) published by Barbara Lawrence in 1951. We measured tarsals from reference collections and built models using techniques in supervised machine learning to assess these criteria. Assessing and improving the use of quality-control methods with robust predictive modeling workflows is a new way to approach data quality. The result is a set of identification criteria that are rigorously verified and designed to handle new data from diverse contexts, which can significantly improve data quality in zooarchaeology.

**Gilmore, Kevin (HDR) and John Ives [248]**

*Walking the Footwear Landscape on the Western Plains Margin: The Implications of 3,500 Years of Footwear from Franktown Cave, Colorado*

Franktown Cave (5DA272) on the Palmer Divide south of Denver contains an assemblage of perishable artifacts unrivaled on the western Great Plains, and among these perishables is footwear from occupations dated 3300 BC–AD 1280. The footwear has proven to be the most useful for determining regional and cultural associations. Most of the analysis of perishable artifacts to date has focused on the AD 1180–1280 Promontory phase occupation containing Subarctic-style moccasins indistinguishable from those found at the Promontory Caves in Utah. Occupations in both regions are interpreted as way-stops during the initial migration of proto-Apacheans from the Dene homeland to the Southwest using Intermountain and Plains margin migration routes. Much less studied but just as remarkable is the small assemblage of plain weave sandals and other artifacts (including coiled basketry and pieces of a rabbit-hide blanket) dated to the transitional Early–Middle Archaic periods (3310–2490 BC). Unlike the moccasins, these perishable artifacts (and projectile points recovered from the site) suggest only general cultural affinities to archaeological cultures of adjacent regions such as the Great Basin and Colorado Plateau. The dates and technological details of the fiber artifacts do not, however, have clear ties to any individual sites or cultures.

Gilmour, Daniel [62] see Boehm, Andrew

Gilson, Simon-Pierre [46] see Bond Reis, Lucas

**Gingerich, Joseph (Ohio University) and William Childress (CUNY; Parsons-New School, NY) [89]**

*Late Paleoindian Plano-like Finds in Virginia and Beyond*

Late Paleoindian Plano or Plano-like finds are not well understood in eastern North America. When documented, the distribution or age of these point types are not as well mapped as their western counterparts. In this paper, we include some known ranges of Plano-like finds in Virginia and portions of the Middle Atlantic Region. Using our own data from southwestern Virginia we offer some insights into the variation in Plano forms, the age of some Plano deposits, and the geographic setting of these Late Paleoindian sites that may be useful in other regional comparisons.

Ginson, Grant [224] see Danielson, Andrew

Gintert, Charlotte [18] see Shaeffer, Megan

Giomi, Evan [215] see Graves, William

**Giovas, Christina (Simon Fraser University), Claudia Kraan (NAAM Foundation) and Amy Victorina (NAAM Foundation)**

[234]

*The CCitRes Initiative: Using Citizen Science and Public Archaeology to Build Heritage Management Capacity in Curaçao*

Caribbean islands face significant heritage management capacity shortfalls that undermine local direction and control of archaeological research for community benefit. The Curaçao Citizen Researcher (CCitRes) Initiative uses citizen science and public archaeology to develop archaeological capacity on one such island, Curaçao, and empower communities to initiate sustained, place-based research for local needs. Jointly undertaken by the Curaçao Cultural Landscape Project and local community partner National Archaeological-Anthropological Memory Management (NAAM) to address resource and training needs in the latter's management of island archaeological resources, in 2022 the CCitRes program conducted a three-day workshop and practicum to train community volunteers (citizen scientists) in archaeological methods. Our objective was to provide advanced training that will allow citizen scientists to contribute to archaeological collections research, especially conservation-relevant investigations on Curaçao's past biodiversity and socio-ecological systems. Here we report the results of the CCitRes workshop, participant engagement in the CCLP and NAAM Foundation's wider public outreach initiatives, supporting physical capacity developments, and an associated media campaign. We critically reflect on lessons learned and discuss the importance of such initiatives for increasing public awareness and access to archaeology, safeguarding heritage, and decolonizing Caribbean archaeology.

Giovas, Christina [121] see Kappers, Michiel

Giovas, Christina [70] see LeFebvre, Michelle

**Giraldo Tenorio, Hernando (Universidad del Cauca) and Víctor González-Fernández (Instituto Colombiano de Antropología e Historia-IC)**

[177]

*Investigación con sensores remotos en la colina piramidal de Tulcán, Popayán, Colombia*

El Morro Tulcán es una colina de forma piramidal de 5 ha, modificada antrópicamente, que representa la estructura monumental prehispánica más grande del suroccidente colombiano. Las excavaciones arqueológicas realizadas hace 50 años en el sitio evidenciaron que se dispusieron centenares de adobes y rellenos de tierra de manera ordenada en un área mayor a 2 ha en sus flancos norte y sur. Las razones para la construcción de dicha estructura no son completamente claras, aunque pudo tener múltiples propósitos. Con el fin de entender mejor las características de este sitio se realizó una prospección con dos tipos de sensores remotos: GPR (GSSI Sir-3000) y Magnetómetro (GSI-856x). Los resultados indican que el área modificada fue mayor a la estimada inicialmente, que se realizaron modificaciones en la cara oeste, y se identificaron algunas anomalías que parecen corresponder a pequeñas estructuras en adobe. La enorme inversión de trabajo en la construcción de esta estructura corrobora las descripciones etnohistóricas del alto grado de complejidad política de la sociedad que habitó el valle de Popayán comparada a otros grupos del norte de Sudamérica.

**Gittelhough, Trevor (Tradewinds Archaeology)**

[135]

*Reservoirs of Knowledge: An Examination of Inundated Resources*

Reservoirs have been an integral part of American history since the nations founding, culminating in over 30 million acres of land being submerged. Inundated by the waters of these man made lakes were innumerable cultural resources that have been lost. Lost to the communities who lived there, to archaeologists, and to the population at large. Determined to have been destroyed by the construction of these reservoirs, these

resources may in fact be some of the best protected cultural resources across the nation and each of these reservoirs may provide us with unique opportunities in advancing our knowledge.

Giuntini, Christine [45] see Leachman, Robert

Glanville-Wallis, Francesca [17] see Graham, Elizabeth

Glascock, Michael [17] see Brown, Clifford

Glascock, Michael [126] see Czujko, Stephen

Glascock, Michael [216] see Goodwin, Whitney

Glascock, Michael [139] see Knobloch, Patricia

Glascock, Michael [10] see Navas-Méndez, Ana

Glascock, Michael [216] see Tykot, Robert

**Glauberman, Phil (Catalan Institute of Human Paleoeology and Social Evolution [IPHES]) and Boris Gasparyan (Institute of Archaeology and Ethnography, Armenia) [56]**

*Middle Paleolithic Land Use and Behavior in the Armenian Highlands: A Preliminary Synthesis*

Over the last two decades, international-Armenian projects have greatly expanded and refined the Middle Paleolithic (MP) record in the Armenian Highlands. Here, we preliminarily synthesize current chronometric, lithic, and faunal evidence. Our goal is to develop some hypotheses on hominin land use, subsistence, and technological behaviors, testable with further research. Among sites dated to ~100–30 ka, we observe a relatively cohesive lithic technology, mainly unidirectional-convergent Levallois core reduction, commonly on obsidian, but including other toolstones in some cases. Sourcing of thousands of obsidian artifacts sheds informative light on technological organization. Provisioning of both individuals and places are well represented among MP sites, as are short-term or infrequent and longer-term or frequent occupations. Age ranges for some MP sites overlap with those from the earliest Upper Paleolithic occurrences in the region. Refinement of stratigraphy and dating will address hypotheses on potential cohabitation of hominin groups that employed different core reduction techniques but may have utilized the same toolstones. The Armenian Highlands MP record demonstrates variable land use and subsistence behaviors in this eco-geographically diverse region. Ongoing and future research will enrich and clarify our understanding of MP lifeways in this region at the nexus of Europe and Asia.

Glauberman, Phil [56] see Haydosyan, Hayk

Glaze, Jennifer [181] see Carter, Andrew

Glémarec, Laurence [226] see Manni, Franz

**Glowacki, Donna (University of Notre Dame) [184]**

*Discussant*

**Glowacki, Donna (University of Notre Dame), Grant Coffey (Crow Canyon Archaeological Center) and Mark Varien (Crow Canyon Archaeological Center) [90]**

*Forty Years of Sustained Community Center Research in the Central Mesa Verde Region*

When he co-founded Crow Canyon Archaeological Center in 1982, Stuart Struever's vision included an understanding that American archaeology needed an institution that could conduct long-term research.

Perhaps nothing illustrates the value of long-term research more than Crow Canyon's sustained research into central Mesa Verde region community centers, which are the largest sites in the region, many with the longest occupation histories. Crow Canyon's research into community centers includes collaboration between many research associates, regional archaeologists, and institutions. Crow Canyon integrated the information gained from these efforts collectively and documented many additional community centers. Crow Canyon's work started when the center mapped Sand Canyon Pueblo in 1983, its regional studies began in 1989, and the documentation and analysis of community centers continues to this day. This paper presents a historical review of this research and analyzes the current community center database that documents 263 of the largest ancestral Pueblo villages in southwestern Colorado.

Gneisinger, Walter [33] see Marreiros, Joao

**Godhardt, Ava (University of Montana) and David Hyde (Western Colorado University)**  
[99]

*What's in a Name: Caches, Offerings, and Problematic Deposits from the Medicinal Trail Hinterland Community, Belize*

Excavations between 2004 and 2019 at the Medicinal Trail Hinterland Community in northwestern Belize have uncovered numerous special deposits from a variety of contexts including caches, termination offerings, exposed offerings, and problematic deposits (PDs). Caches and the offerings have been reported on extensively and are generally understood to have functioned in a mortuary or dedicatory context. On the other hand, PDs are, as the nomenclature indicates, less understood or defined and do not conform to established patterns of intentional depositing. It is a provisional term applied to a recognized specially deposited materials with an unknown function or intent. They deviate from the expectations based on content and context. This poster will provide definitions and descriptions for the various types of offerings present at Medicinal Trail, and provide an interpretation of the meaning for these deposits.

Godhardt, Ava [102] see Gutiérrez Ruano, Patricio

Godinho, Ricardo [102] see Gonçalves, Célia

**Goebel, Ted (Texas A&M University), Angela Gore (Arkansas Archeological Survey), Jeffrey Rasic (National Park Service) and Kelly Graf (University of Kansas)**  
[15]

*Late Pleistocene Technological Organization at Shég' Xdaltth'í, Central Alaska*

Ongoing excavations at Shég' Xdaltth'í along McDonald Creek in the Tanana Flats, central Alaska, have yielded a unique assemblage of stone artifacts associated with a rich inventory of faunal elements, all dating ~13,900 calendar years ago. In this paper, we present the preliminary results of an analysis of artifacts recovered so far, both lithic and osseous. The flaked-stone assemblage is dominated by rhyolites, but other volcanics and cherts also occur. Debitage is almost exclusively very small in size, mostly late-stage biface-reduction flakes and tiny unifacial-pressure flakes (together numbering in the tens of thousands), while cortical spalls and core-reduction flakes are rare. Related tools include finished (possibly hafted) Chindadn-like bifaces, mostly with triangular or tear-drop shapes; side scrapers; flakes with marginal retouch or use-wear; a large cobble plane; and a possible burin spall (from a biface). The osseous assemblage includes a small set of worked fragments that may represent projectile technology. Overall, the assemblage appears to represent hunting and carcass-processing activities at a residential site away from sources of high-quality raw materials. The presence of Chindadn-like points and a plane, as well as the lack of microblade technology, suggests the assemblage represents an early example of the Nenana complex.

Goebel, Ted [15] see Graf, Kelly

Góes Neves, Eduardo [59] see Kater, Thiago

Goggin, Charlie [122] see Firenzi, Alexandria

**Golay Lausanne, Kayla (McMaster University) and David Chicoine (Louisiana State University) [177]**

*Multimodal Mapping at Cerro San Isidro, Nepeña Valley, Peru*

This poster presents the preliminary results of multimodal mapping efforts at Cerro San Isidro, a multicomponent archaeological complex located in the Moro region of the middle Nepeña Valley, north-central coast of Peru. Based on its size and strategic location on a natural promontory overlooking the confluence of the Loco and Nepeña rivers, the site is interpreted as one of the most important ancient human centers in Moro. In June and July 2022, our team incorporated Unmanned Aerial Vehicle (UAV), Ground-penetrating Radar (GPR), and pedestrian surveys in combination with excavations in an effort to document spatial, architectural, and material arrangements at Cerro San Isidro and its vicinity. Excavations and GPR surveys inform on the anthropogenic transformation of the settlement from a “natural” geological formation to a complex of terraced platforms and architectural compounds. Multimodal fieldwork also brings preliminary data on accessways and movement across the site and between its different sectors. Finally, pedestrian and GPR surveys in adjacent cultivated fields confirm the vast extent of the archaeological complex, far beyond the boundaries noted by past studies. In combination, the various methods deployed in 2022 provide powerful and variegated insights into the spatial organization of Cerro San Isidro.

**Goldberg, Kelly (University of South Carolina) and Kevin Fogle (University of South Carolina) [169]**

*Using Digital Technologies to Enhance Public Interpretation and Increase Access at Booker T. Washington National Monument*

The site of Booker T. Washington’s birth and enslavement in Hardy County, Virginia, has been honored since 1945 when the farm was purchased to serve both as a memorial and a school. Eventually incorporated into the National Park system in the 1950s, this site has been the focal point of various historical landscape research endeavors, seeking to interpret experiences of slavery, the Civil War, and emancipation. For over half a century, shifting sociopolitical climates, development of archaeological landscape theory, and increases in applications of multivocality in site interpretation have impacted research motivations and directly affected the trajectory of park interpretive frameworks. This paper discusses ongoing efforts to incorporate digital technologies to more readily engage a public audience in the conversation behind academic research agendas, and explore the complexities of interpretive strategies at a National Park Service site that highlights complex and compounded histories.

**Goldberg, Paul (University of Tübingen) and Vera Aldeias (Universidade do Algarve) [212]**

*Geoarchaeology, the French Paleolithic, and Harold*

Geoarchaeology requires the practitioner to be versed in both geology and archaeology. To do it right necessitates active participation of other specialists on the team, starting with the archaeologist(s). Without them, even the best geoarchaeological endeavors can fall flat. Both of us were fortunate to work with Harold Dibble for nearly 20 years investigating geoarchaeological aspects of Paleolithic cave sites in France and Morocco. Harold’s research legacy centered on Middle Paleolithic lithic variations and developing excavation methodologies, but he also focused on understanding site formation. Major issues that we (and Harold’s team) tried to tackle included Neanderthal use of fire, the micro- and macro-stratigraphic context of Neanderthal skeletons, and formation processes related to past environments and Neanderthal behaviors. Through a close integration of geoarchaeological and archaeological data, we show, for example, that the infant at Roc de Marsal was not intentionally buried, and that there appears to be a pattern of fire use in the

warmer last interglacial and not in cold stadials in SW France. Sedimentological observations and fabric analyses of stone tools were often key for making these assessments. Harold was most importantly a data-driven scientist; his contributions pushed archaeology forward as a scientific endeavor.

**Golden, Charles (Brandeis University)**

[17]

*Discussant*

[83]

*Moderator*

Golden, Charles [172] see Scherer, Andrew

**Goldfield, Anna (Boston University)**

[40]

*Discussant*

**Goldstein, Lynne (Michigan State University—Retired)**

[195]

*Moderator*

**Golitko, Mark (University of Notre Dame), Mirko Uy (University of Notre Dame) and Melissa Berke (University of Notre Dame)**

[235]

*Preliminary Chemical Fossil Assessment of Mid to Late Holocene Environment and Human-Forest Dynamics on the North Coast of New Guinea*

Archaeological interest in environmental and human impacts on society and ecosystems has intensified, with mounting evidence of global anthropogenic climate change and landscape modification. Tropical lowland forests, once believed to represent pristine ecologies only marginally impacted by human activity, are now understood to reflect millennia of human management. Here, we report on a preliminary application of chemical fossil (organic biomarker) analyses to cored sediments from the Aitape area of northern New Guinea, covering the period from ~6000 to 2000 BP. Analysis of charcoal from these cores suggests significant changes in forest management, including evidence for periods increased forest clearance and burning relative to present practices. However, the relative impacts of mid-Holocene temperature variability, shifting rainfall regimes, and changes in human activities are poorly understood, owing to lack of more traditional proxy preservation, including pollen. We analyze chemical biomarkers to assess (a) fluctuations in rainfall levels linked to diachronic variations in temperature and the ENSO cycle, (b) changes in forest composition and local ecology, and (c) impacts of human activity including burning and how horticultural and other activities contributed to changing forest composition.

**Gomes, Amanda (Hokkaido University)**

[185]

*Local Pride and Prejudice: Public Archaeology, Archaeological Heritage Management, and Authorized Discourse in Japan*

For almost two decades, Japanese archaeology has fostered discourse on public archaeology and initiatives that involve the public in archaeological practices. This development coincides with a shift in cultural resource management policies that emphasize and expand the role of cultural properties within communities. Based on a discourse analysis of the academic corpus on public archaeology in Japan, this presentation explores the practice's ideological foundations and its relationship with national narratives concerning heritage. This

analysis identifies a dominant model of community-oriented practices within Japanese archaeology aligned with neoliberal heritage policies. Local communities are addressed primarily through educational and promotional initiatives aimed at encouraging civic pride and economic development. While the engagement of local communities in archaeological practices has increased in recent years, the findings indicate that there are relatively fewer examples that diverge from dominant narratives concerning strengthening national and local identity. These trends have serious implications for contested heritage in Japan, especially concerning ethnic minorities and the Ainu, the Indigenous people of Japan. The distinct discourse accompanying the recent promotion of Ainu culture is indicative of the barriers to the development of Indigenous archaeology in Japan.

Gómez Chávez, Sergio [3] see Buckley, Gina

Gomez Luna, Serafín [44] see McKee, Brian

**Gonçalves, Célia (ICArEHB, Universidade do Algarve), João Cascalheira (ICArEHB, Universidade do Algarve), Cláudia Umbelino (CIAS, Universidade de Coimbra), Ricardo Godinho (ICArEHB, Universidade do Algarve) and Dany Nogueira (CIAS, Universidade de Coimbra)**

[102]

*Taken Too Soon: The Context of Two Child Burials at the Mesolithic Shell Midden of Cabeço da Amoreira (Muge, Portugal)*

Close to 160 years of investigation at the Muge shell middens (Central Portugal) have revealed more than 300 Mesolithic human skeletons. Most of these burials were identified during the earliest excavations, and thus most of them have insoluble problems of associated materials, provenance, stratigraphy, and chronology. Since 2008 our team has been developing new work at Cabeço da Amoreira, one of the largest shell middens in the region, from where we recovered, using modern geoarchaeological techniques, a series of new burials, and new types of data that allow a more detailed reconstruction of these burials. This poster will present new data on the context of two child burials recovered from two different areas of the site, focusing not only on the bioanthropological details but mostly on the sedimentary contexts and the relationship with other archaeological features identified at the site.

Gonçalves, Célia [239] see Cascalheira, João

**Gonlin, Nancy (Bellevue College)**

[125]

*Chair*

**Gonlin, Nancy (Bellevue College), David Webster (Pennsylvania State University) and David Reed (Ohio State University)**

[125]

*House of the Boxer, House of the Fire God: Sport and Religion in a Humble Hinterland Household of the Copan Classic Maya, Honduras*

A Classic Maya rural household, Site 34C-4-2, yielded two artifacts considered unusual for this nonurban context: a *manopla* (a 15-pound tuff ball with a handle used in a sport similar to boxing) and a miniature sculpture of a house or altar that resembles those found in Copan's urban core. The house model might have been used for offerings to the Maya deity of fire and perhaps functioned as a *k'ahk o'toot* (fire god house). The site, located just outside the Copan pocket in the Sesesmil drainage, was excavated in 1986. It sits on a prominence near the mouth of the Sesesmil drainage, a location that presents broad views of the valley. We made extensive lateral exposures of the courtyard and most of the four structures. Pottery analysis reveals

patterns similar to those at the elite urban group, 8N-11 in Copan's urban core. The two unusual artifacts provide novel insights about the rural inhabitants. The residents of this household prospered for several centuries and were involved in practices usually associated with elite Maya people. Such objects warrant reassessment of this outlying humble household and others like it.

Gonzales, Ian [216] see Crider, Destiny

### **Gonzales, Moises**

[215]

*Querencia: Community Reciprocity in Management of the Cultural Landscape by East Sandia and Manzano Land Grant Communities*

*Querencia*, the vernacular term for love of homeland, can be conceptually deployed as a historical organizing framework for traditional Indo-Hispano land-based communities in northern New Mexico. *Querencia* can be described through the historical function, form, and relationship of these systems, sustained by community resiliency, and founded on the ecological elements that underlie the cultural landscape. This study examines how the community reciprocity model embedded in the concept of *querencia* is used in the management of cultural resources within the East Mountains region of central New Mexico. The land grant communities of Chilili, Cañón de Carnué, and San Antonio de las Huertas will be used as sites for unpacking the concept of *querencia* in maintaining community knowledge for the communal management of land.

Gonzales Avendano, Victor [129] see Ebert, Claire

### **González Lombardi, Andrea (Universidad de Ingeniería y Tecnología)**

[12]

*Local and Imperial Powers at the Huancabamba Depression: The Alto Piura Case*

The peoples of the inner Piuran coast have a deep link with water management and agriculture that was consolidated around AD 1000 under the administration of local and foreign groups which densely occupied the Alto Piura (chaupiyunga) through administrative centers and irrigation systems. Using aerial photographs and RPA imagery, this research proposes an architectural typology and sequence to understand the regional sociopolitical process. The natural corridor formed by the Piura River was gradually transformed into a pivotal cultural landscape for interactions and exchange of goods between coastal polities within the Huancabamba Depression. The Sicán and Chimú centers at Pabur Viejo and El Ala suggest that these entities exerted control over the left margin of the Piura River, while later the Inca and the Spanish empires occupied the right margin. In parallel, processes of centralization and ethnogenesis during the fifteenth and sixteenth centuries transformed local economy and regional exchange dynamics. The Alto Piura transformed from a diversely managed territory under the coexistence of local and other coastal entities (Sicán and Chimú), into an imperial province controlled by the Inca center of Piura (La Vieja). Lastly, during the early Spanish occupation this center prevailed and dominated all the Huancabamba Depression.

Gonzalez, Aaron [105] see Kardulias, Drosos

### **Gonzalez, Albert (Cal State University, East Bay)**

[117]

*Academic Museums as Instruments for Increasing BIPOC Representation in CRM*

Under the directorship of Dr. Albert Gonzalez, the C. E. Smith Museum of Anthropology at California State University, East Bay (CSUEB) has dedicated much of its resources and staff time to exploring creative methods by which to connect BIPOC undergraduate students and recent graduates to the CRM network and

related jobs in the region. In this presentation, Dr. Gonzalez will discuss the museum's multipronged approach to student CRM exposure, network enhancement, and placement, including (1) industry-themed museum exhibits, stationary and traveling; (2) a classroom-based speaker series connected to the museum's course allotment; (3) the museum's hosting of a regional CRM job fair; and (4) development of multiple direct pipelines between CSUEB students and CRM hiring managers. The presentation will conclude by looking ahead toward the development of new and well-funded partnerships between the CRM industry, the academy, and the museum world that connect streams of well-qualified BIPOC candidates to entry-level and other CRM positions in preparation for long-term careers in the field.

Gonzalez, Edith [16] see Perdikaris, Sophia

Gonzalez, Fernando [239] see Stark, Richard

Gonzalez, Juan [181] see Skowronek, Russell

**Gonzalez, Sara (University of Washington, Seattle)  
[107]**

*Discussant*

**Gonzalez, Sara (University of Washington, Seattle), Briece Edwards (Confederated Tribes of Grand Ronde Community of Oregon), Yoli Ngandali (University of Washington) and Ian Kretzler (Cultural Resource Consultants)  
[14]**

*Doing Archaeology in a Good Way: Reflections with and from Grand Ronde*

Since 2014, Field Methods in Indigenous Archaeology has worked in partnership with the Confederated Tribes of Grand Ronde Community of Oregon's Historic Preservation Office to create a Grand Ronde way for doing archaeology. This approach is grounded in the values and protocols of the Tribal Nation and seeks to build the capacity of archaeology—and future archaeologists—to care for and protect Tribal heritage. Reflecting on the outcomes of this collaboration, we consider the relevance of our work for the wider discipline of archaeology and heritage management. We also look toward to the future to think about how Indigenous archaeologies and their emphasis on equity and justice may provide sustainable frameworks for using archaeology as a tool to not only study but offer solutions for some of the major challenges facing Indigenous communities and their heritage.

**Gonzalez, Silvia (Liverpool John Moores University) and Samuel Rennie (Bournemouth University, UK)  
[61]**

*Paleoindians from Mexico: What Do They Tell Us about the Early Peopling of the Americas?*

Mexico is important in the debate on the early peopling of the Americas because several well-preserved Paleoindian/Preceramic individuals with ages between 13,000 and 8,000 years have been found in lake sediments/volcanic deposits surrounding a Late Pleistocene Lake in Central Mexico and in submerged caves (cenotes) in the Yucatán Peninsula, flooded about 8,000 years ago. We will discuss their stratigraphy and dating together with information on the skeletal variation found in Mexico. We then will compare their craniometric information against other Preceramic human populations in Mexico (e.g., Ancient Californians from Baja California Peninsula, Coahuiltecan) and elsewhere in the Americas (e.g., Kennewick Man, Prehistoric Chumash from the Channel Islands in the USA, Lagoa Santa, in Brazil) to establish connections and migration pathways across the American Continent. Our data strongly support a Pacific Coast migration route passing through Mexico but also a different one following the Gulf Coast of Mexico.

González-Fernández, Víctor [177] see Giraldo Tenorio, Hernando

**González Gómez de Agüero, Adrián (Trent University), Julia McCuaig (Trent University), Francesca Fernandini (Pontifical Catholic University of Peru) and Paul Szpak (Trent University)**  
[29]

*Can I See the Menu, Please? Isotopic Baselines and Human Diet in the Andes*

Carbon and nitrogen isotope values of plants reflect the environmental conditions under which they grew. Isotopic variation caused by environmental variation is often passed on to consumers, including humans, such that each region and time period has its own isotopic signature and variability. Isotopic paleodietary analysis in the central Andes often relies on archaeological baselines from other regions and time periods or on modern foods. This is especially the case for the coastal resources of the Central Andes. Creating unique baselines for specific sites and time periods is ideal, but often challenging. This research presents a complete food source carbon and nitrogen isotope baseline for the archaeological site of Cerro de Oro in the Cañete Valley, Peru. This baseline includes  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  measurements of all the different food sources found at the site (e.g., plants, marine animals, camelids, and guinea pigs). This isotopic baseline allows us to understand the life history of an inhabitant of the site whose bone, hair, nail, and teeth have also been subjected to isotopic analysis.

**Gonzalez-Tennant, Edward (University of Texas, Rio Grande Valley)**  
[39]

*Discussant*

**Gonzalez-Tennant, Edward (University of Texas, Rio Grande Valley), John Dysart (US Forest Service, Ocala National Forest), Taylor Collore (US Forest Service, Ocala National Forest), Rachel Thompson (US Forest Service, Ocala National Forest) and Alex Nalewaik (University of Central Florida)**  
[98]

*The Role of Federal-Academic Partnerships in Training the Next Generation of Archaeologists: A Case Study from the Ocala National Forest*

The Ocala National Forest is the largest in the southern United States. Its 400,000 acres is home to 14,000 years of human history. In 2019, authors Dysart and Gonzalez-Tennant developed a multiyear project centering on an iterative approach to predictive modeling, including field testing to refine results. Annual internships, field schools, and graduate theses support this and related goals. Dozens of students have been trained, and many, particularly graduate students, have been engaged (and financially supported) as core members of the partnership, which is designed to prepare students for professional careers with state/federal agencies and private companies. This paper discusses our approach to creating and sustaining the partnership, our collaborative process for training students, and an overview of documented resources. For instance, use of open-source GIS to identify unrecorded Indigenous mounds via lidar. Other open-source digital technologies (e.g., photogrammetry, RTK GNSS) support our work through the rapid documentation of historical resources.

Gonzalez-Tennant, Edward [181] see Skowronek, Russell

**Goodling, Bailey, Alicia Fritz (School of Human Evolution and Social Change), Jingyu Liang (School of Human Evolution and Social Change) and John Murray (School of Human Evolution and Social Change)**  
[41]

*An Assemblage-Level Comparison of Silcrete Flake Attributes across Three Methods of Heat Treatment: Preliminary Results from Actualistic Experiments*

Lithic heat treatment technology was utilized as early as ~162,000 years ago at Pinnacle Point in South Africa to improve the quality of silcrete raw material for flaking. Despite its antiquity, we have little understanding of how

these early Middle Stone Age humans heat-treated silcrete and why. A primary reason for this is a general lack of proxies for determining the method of heat treatment in the archaeological record that have been rigorously demonstrated through large-scale, actualistic experiments. Further, there are only a handful of actualistic studies that attempt to quantify and compare the outcome of each method of heat treatment. Here, we analyze flakes knapped from 20 unheated and experimentally heat-treated nodules of silcrete across three methods of heat treatment: the direct method, the ember method, and the sand bath method. Using the E5 lithic coding system developed by Shannon McPherron, we document qualitative and quantitative flake attributes and aggregate these data by heat treatment method to determine if there are statistical differences or discernable patterns between methods of heat treatment at an assemblage scale. Our results will allow us to better understand how the method of heat treatment relates to the characteristics of silcrete flake assemblages.

Goodling, Bailey [66] see Murray, John

Goodman, Elizabeth [176] see Reid, David

**Goodwin, Whitney (University of Missouri), Hector Neff (California State University, Long Beach), Daniel Pierce (University of Central Florida) and Michael Glascock (University of Missouri Research Reactor)**

**[216]**

*The Mesoamerican Ceramic Neutron Activation Analysis (NAA) Database at MURR: History, Current Status, and Future Directions*

In the nearly 35 years since the Archaeometry Laboratory at the University of Missouri Research Reactor (MURR) was founded, the Mesoamerican Ceramic NAA database has grown to almost 30,000 entries spanning Mexico, Guatemala, Belize, El Salvador, Honduras, Nicaragua, and beyond. This paper presents the history of how the database came together, highlighting key contributions, remarkable findings, and significant debates. The scope and breadth of the current database will be discussed with particular attention to areas that provide ample opportunities for future collaborative research.

Goodwin, Whitney [216] see Tykot, Robert

**Gore, Angela (Arkansas Archeological Survey)**

**[42]**

*Exploring Toolstone Provisioning on the Nenana Valley Lithic Landscape*

The Beringian record is critical to understanding human dispersals and adaptive behaviors of the earliest peoples in the Americas. Late Pleistocene and Holocene peoples subsisted on a dynamic and changing landscape that undoubtedly influenced technological organization, including toolstone procurement and selection patterns. The interior Alaskan record is rich in well-preserved lithic assemblages offering insight into these aspects of adaptive behavior. Portable X-ray fluorescence (pXRF) is a useful geochemical technique used to explore toolstone procurement strategies in the lithic record, most used in sourcing obsidians. Non-obsidian volcanic toolstones (e.g., dacites, rhyolites, basalts, and andesites) are abundant in interior Alaskan assemblages yet understudied compared to obsidian. Geochemical analyses of these non-obsidian materials offer the potential to gain new insights into ancient toolstone provisioning behaviors. This poster presents results of my dissertation research synthesizing geochemical (pXRF) analyses of non-obsidian volcanic artifacts and geological samples, systematic regional raw material surveys, and lithic technological analyses collected from 19 late Pleistocene and Holocene assemblages from the Nenana Valley, interior Alaska, providing a more nuanced look at late Pleistocene and Holocene toolstone provisioning patterns.

Gore, Angela [241] see Beahm, Emily

Gore, Angela [15] see Goebel, Ted

Goriunova, Olga [53] see Weber, Andrzej

Gorman, Alice [55] see Walsh, Justin

Gosner, Linda [95] see Plekhov, Daniel

**Goudge, Charlotte (Brandeis University)**

[46]

*Seasonal Visibility and the Panoptic Plantation: Exploring the Use of “Fertile” Landscapes and 3D GIS Visualization Technologies on Plantationscapes*

Landscape approaches utilizing line-of-sight profiles and viewsheds to compute intervisibility are far from new techniques in archaeological research. Various well-known works have described the methods and theory used to map visibility on plantationscapes. However, due to a lack of technological capabilities, most have been forced to utilize incomplete datasets, applying analysis to “barren” landscapes lacking buildings, vegetation, or any temporal and/or cyclical fluctuations, particularly concerning local ecologies. As computers and geographic information systems (GIS) technologies expand, however, more advanced visualizations and analyses have become feasible. One area of GIS technology seeing rapid advancement is the expansion of geographically accurate 3D data, which allows the development of interactive perspective models. This paper details the methods and approaches used to build a “fertile” landscape from a historic land plat map depicting Codrington-owned plantations in Antigua, WI, using 3D GIS. In using Viewshed Analysis to examine the local topography (DEM) populated with georeferenced, z-enabled features (buildings, environmental characteristics, roads, and fields) to create a Digital Surface Model (DSM), this research considers the effect of variations in seasonal vegetation on visibility around the estates and their domains to reassess plantation spaces and landscapes of power.

**Goudiaby, Hemmamuthé and Jaqueline García Basto (UADY—Laboratorio de Bioarqueología)**

[58]

*Dusk and Dawn: Change and Continuity in Funerary Programs in the Maya Lowlands during the Ninth and Tenth Centuries CE*

During most of the Classic era (250–900 CE), Maya funerary practices were locally defined. Particularly in the Maya Lowlands, burial programs would shift from one capital to the next, while remaining well-codified on a local level. The modes of positioning, orientation, and burial define archaeologically identifiable norms of mortuary behavior. Nevertheless, if less volatile than exchange networks of goods, mortuary ideologies also evolve and travel. Whether during times of subtle changes or through more drastic collective sociopolitical crises, even the codification of an act as intimate as burying dead relatives is prone to suffer rupture. A systematic survey of 7,000 Late and Terminal Classic Lowland Maya burial contexts upholds our present examinations of the changes versus continuities in Lowland Maya mortuary programs toward and after the close of the eighth century, a time when the threads of the social tapestry began to draw new motives. Further discussion addresses specific questions, such as, Do the population dynamics accompany shifts and replacements of formerly held mortuary parameters? Where and what are the new burial practices introduced past the fall of Maya kingdoms? Do the remnant communities of the post-collapse era cling to preexisting ideologies, or do they detach from them?

**Grabill, Nicholas**

[40]

*Discussant*

**Graesch, Anthony (Connecticut College) and Makena Lurie (Connecticut College)****[44]***End-of-Life Purges of Massive Domestic Assemblages: Staging Archaeological Interventions and Reanimating the Social Lives of Discarded Belongings*

North American houses are among the largest in the world and, for the better part of a century, their occupants have been accumulating and storing possessions at a rate and volume unlike any other period in human history. These lifelong-amassed assemblages are rarely kept or valued by descendants, and at the conclusion of homeowners' lives, the bulk of home possessions are wholesale purged—from houses and from collective memory. This poster highlights several nodes of research emergent in archaeological interventions in the flow of massive assemblages of home belongings to landfills. Drawing on data gathered during pilot studies of mostly intact domestic assemblages intercepted at materials reclamation facilities (MRFs), we explore how the archaeological investigation of contemporary end-of-life inventory purging affords an examination of relational materialities in ways seldom enjoyed in other archaeological contexts. We consider the ways that discarded possessions 'haunt' the present when their social lives are reanimated in the context of archaeological research; we show how the end-of-life disarticulation of domestic assemblages is immediate, rapid, and violent; and we ask whether we owe anything to the objects that, over decades, were imbued with special meanings and shaped (our) domestic lives.

**Graf, Kelly, Nathan Shelley, Julie Esdale and Ted Goebel****[15]***Site Stratigraphy and Radiocarbon Dating at the Shég' Xdalth'í Site in Central Alaska*

Shég' Xdalth'í is located approximately 55 km southeast of Fairbanks, Alaska, approximately 55 km northwest of the Broken Mammoth / Mead/Holzman / Swan Point complex of sites, and about 18 km northwest of Upward Sun River. Continuing excavations have provided tens of thousands of material remains, consisting mostly of lithic artifacts, but also several thousand animal bones, pieces of charcoal, a small set of osseous implements, and several domestic features preserved in a well-stratified context in the site's lowest archaeological layers. Over 40 radiocarbon dates establish at least three site visits dating to the terminal Pleistocene. In this presentation, we present details of site stratigraphy, preliminary sediment analyses, and radiocarbon dating of these deposits to place them in geoarchaeological context.

Graf, Kelly [15] see Goebel, Ted

**Graff, Sarah (Arizona State University)****[208]***Food Futures: Culinary Archaeology and Anticipating the Future*

Imagining what a culinary archaeology might look like involves anticipating the future. In fact, all archaeological practice is concerned with the future even if it is not stated explicitly and archaeologists working on food preparation practices are no exception. As climate change continues to impact (at an alarming rate) sites, travel, collections, data management, social relationships, and the politics and economics of archaeological practice, we must consider the impact archaeological work has on contemporary issues. How might a culinary archaeology help or harm food-related problems that are visible in the present and will become more pronounced in the future? How can we employ information gleaned from the past to inform future practices? This paper will argue that anticipating what archaeological research into food means for the future will focus our scholarship, more explicitly connect the present with the past, and work toward solving food-related problems of the future.

**Gragson, Ted (University of Georgia)****[24]***Military Encounters between Vascones and Barbarians in Francia and Iberia between the End of Roman Rule and the Eleventh Century*

Pursuit of Basque national identity in the Western Pyrenees Mountains emphasized their linguistic isolation

(i.e., last speakers of a non-Indo-European language) and purported ethnic antiquity (i.e., residents since, if not before, the Last Glacial Maximum). This overshadowed inquiry on encounters between Basque as Vascones and Barbarians from across the Rhine as the latter fulfilled their territorial and political aspirations in Francia and Iberia. Paulus in his usurpation challenge to Wamba the Visigothic king in 673 ridiculed the Vascones as mountain goats scampering across barren and inhospitable mountain peaks away from the strongest and fiercest lion (i.e., Wamba) and yet a century later Vascones warriors called “spears” by the Saxon Poet destroyed Charlemagne’s rearguard and killed several of his paladins. Mountains have long been ignored by historians from the surrounding plains as little more than places where pastoralists seek refuge from the influence of kings or as the hideout for thieves from where they can antagonize kings. Contemporary historical and archaeological research in combination reveal the Vascones as strategically isolated yet militarily engaged with and against the vertically integrated regnoms of the surrounding plains, and their interactions jointly contribute to political and social change in the lands of their encounters.

Gragson, Ted [113] see Garland, Carey

**Graham, Elizabeth (UCL Institute of Archaeology), Francesca Glanville-Wallis (University College London), Daniel Evans (Cranfield University), Julia Stegemann (University College London) and Simon Turner (University College London)**

[17]

*“Down to Earth”: The Primacy of the Terrestrial*

The concept of the Critical Zone makes clear that our future depends on the layer between the atmosphere and bedrock: the earth—which tellingly also serves as the name for our planet. Our Earth’s soils record the past and structure the future. Tim and Sheryl have worked in many places in the world, but I know them through their research on soils and land use in the Maya area. It is no exaggeration to say that I and my team have been inspired not only by their work but by their ideas, the innovative context of their interpretations, and not least their path-breaking results. In this presentation I describe the path my team and I have taken in soils research. Precolumbian activities drive the research, but our interest goes beyond ancient land use to assessing the impact on modern soils of the built environments of the past: Maya, historic, and recent. How did the decomposition of the material culture of the past contribute to the makeup of modern soils? Can a methodology be designed for the study of this long-term trajectory, and how can such a methodology contribute to global soil and food security?

Graham, Elizabeth [11] see Aimers, Jim

Graham, Lain [71] see Bruck, Seth

Graham, Shawn [55] see Walsh, Justin

**Granados, Suzan**

[126]

*An Investigation of Middle Archaic Maize at Site LA 112766*

This paper provides evidence of the presence of maize in southeastern New Mexico radiocarbon dated to 1,000 years prior to any in a dataset of 30 known southeastern New Mexico “Old Maize” sites. The oldest maize site is Keystone Dam radiocarbon dated to 3540 cal BP. Site LA 112766 radiocarbon dates to 4825–4575 BP. An investigation of the macrobotanical, phytolith, starch, radiocarbon dating, ceramic, and metate analyses was conducted on site LA 112766 to determine when and to what extent maize was used. The identification of Middle Archaic maize at site LA 112766 is significant and pushes the earliest appearance of maize back 1,000 years and indicates that the introduction and migration of maize into New Mexico may have occurred differently than is currently accepted. The Guila Naquitz site in, Oaxaca, Mexico, radiocarbon dates

to 5420 BP. This site may have been a source of maize migration into southeastern New Mexico. Archaic groups may have informally grown maize along the Pecos River. The maturity period for prehistoric maize is much shorter than for modern maize. The growing season may have become part of the seasonal round.

Grant, David [175] see Hill, Brittany

**Grauer, Kacey (Stanford University)**

[243]

*Aventura's Watery Landscape: Communities of People, Water, Houses, and Ancestors*

Water was essential for the longevity of ancient Maya cities, and Aventura was no exception. The site's watery landscape consists of pocket bajos, defined as karstic depressions less than 2 km<sup>2</sup> in area. While they are seasonally inundated today, this paper presents data from excavation, oral histories, and microbotanical analysis that demonstrate they were much wetter in the past, holding standing water year-round as recently as the late nineteenth century CE. These features were of great importance to the city during ancient Maya occupation, providing water for biophysical and metaphysical needs. Excavations of two households on the edges of different pocket bajos indicate that commoners and elites alike were able to physically access these spaces, as well as perform ancestor veneration to mark cosmological connections at the water's edge. Based on these data, I argue that the watery landscape at Aventura was not part of a passive backdrop to human activity but was instead active in the creation and maintenance of the city, fostering communities that extended to include nonhumans.

Grauer, Kacey [243] see Fitzgerald, Kat

Grauer, Kacey [243] see Wong, Eponine

**Grávalos, M. Elizabeth (Field Museum)**

[233]

*Chair*

**Grávalos, M. Elizabeth (Field Museum)**

[233]

*Kaolin as the Stuff of Politics among Recuay Communities? Applying Political Geology to Ancient Andean Ceramics*

Recent scholarship argues that the knowledge and use of earthly materials is a power-laden field that is relationally distributed across everyday activities. This paper draws on these theoretical discussions in "political geology" to grapple with three interpretations for prehispanic Recuay kaolin pottery. Recuay villages flourished between 100 and 700 CE in Peru's highland Ancash region. Recuay communities shared a common material culture (e.g., kaolin finewares), which was enmeshed in mutual ontological dispositions and cultural practices. However, their sociopolitical and cultural organization do not easily fit into archaeology's neat political categories. Archaeologists have classified Recuay political arrangements in diverse ways, from "chiefdom" to "commonwealth." I use archaeometric data to consider the ways in which archaeologists can interpret kaolin pottery to understand Recuay political relationships. First, I show how archaeologists draw sociopolitical boundaries using scientific categorizations of elemental and mineralogical data. Second, I consider how kaolin's vital materialism (sensu Bennett 2010) may have helped to organize Recuay politics and territory. Finally, I draw on Andean ontologies to evaluate the role of kaolin deposits as salient political actors. Each of these interpretations may lead archaeologists to different conclusions; thus, this juxtaposition troubles the use of ceramic data to infer ancient political relationships.

Grávalos, M. Elizabeth [233] see Roddick, Andrew

**Gravel-Miguel, Claudine (Université de Montréal)**

[87]

*Chair*

**Gravel-Miguel, Claudine (Université de Montréal), Julien Riel-Salvatore (Université de Montréal), Fabio Negrino (Università di Genova), Emanuela Cristiani (Sapienza–Università di Roma) and Roberto Maggi (Università di Genova)**

[87]

*Re-documenting the Pleistocene–Holocene Occupations of Arma dello Stefanin in Liguria, Italy*

In 2022, our team started work at the Arma dello Stefanin to document the stratigraphy that had been unearthed in the 1960s and 1980s. In this presentation, we will summarize the results of our attempts to date the stratigraphy of the site to place it within its proper temporal context. This is the second conference presentation of our project “Documenting Forager Adaptations to Dramatic Climate Change at the Pleistocene-Holocene Transition in Liguria (Italy),” which aims to connect regional occupations dated to the transition to the broader social networks that were maintained during this period. Given that an important part of this project is to study archaeological assemblages from previous excavations, documenting the stratigraphic attribution of the assemblages is key to identifying potential links between contemporaneous sites.

Gravel-Miguel, Claudine [87] see Riel-Salvatore, Julien

**Graves, Michael, Katherine Peck (University of New Mexico), Jesse Casana (Dartmouth College), Carolin Ferwerda (Dartmouth College) and Jonathan Alperstein (Dartmouth College)**

[69]

*High-Precision Photogrammetry Mapping of the South Kohala Agricultural Field System, Hawai‘i Island*

Many archaeologists employ high-precision remote sensing to study surface remains at a landscape scale. Hawaiian archaeologists pioneered remote sensing using aerial photography in the Kohala peninsula of north Hawai‘i Island, beginning in the 1960s, and it was the location for the first regional-scale application of lidar in Hawai‘i. In March 2022, researchers conducted a high-precision drone-based survey of agricultural features spread across nearly 5 km<sup>2</sup> in the lightly vegetated uplands of Kawaihae in South Kohala. The survey produced both a photogrammetric Digital Surface Model and a series of orthophotographs of the surface archaeology and terrain at high resolution. We show here how photogrammetry improved identification of surface agricultural features including field borders, individual plots, and in-field rock planting mounds. We also mapped in detail an extensive irrigation-based network of ditches and natural drainages that transported water 5 km downslope from upland streams to fields located in areas where dryland farming would have been impossible. We suggest photogrammetry might be preferable to other forms of remote sensing in arid environments where surface archaeology is visible.

**Graves, William (Statistical Research Inc.; University of Arizona) and Evan Giomi (Statistical Research Inc.)**

[215]

*A New Take on Cultural Identities at Chilili Pueblo and the East Mountains Villages*

In this presentation, we explore how group identities were constructed and experienced at the northernmost Salinas pueblo, Chilili, and among the villages of the East Mountains area during the late prehispanic and early colonial periods (ca. AD 1300–late 1600s). We examine artifacts from recent excavations at Chilili to consider the manners in which residents of these communities were engaging local and extra-local groups or cultures in ways that may have been the “raw materials” of making, transforming, and experiencing cultural identities. In particular, we focus on data from obsidian objects, faunal remains, and ceramic types, alongside proportions of different Glaze Ware attributes, to map engagements with other regions of New Mexico. Generally, archaeologists have conceived of places like Chilili and the East Mountains as “peripheral” somehow to “core” areas like the Galisteo Basin and the Rio Grande Valley—they are often seen as derivative or hybrids. Rather, we argue that the East Mountains area and Chilili simultaneously engaged with these “core” areas while remaining distinct from them. Their inhabitants had identities and cultural lives that were complex, rich, and imaginative, and that were built from the larger cultural or social worlds within which they were embedded.

Graves, William [230] see Van Keuren, Scott

**Gray, Michelle (US Forest Service)****[135]***Afro-Caribbean Ceramics of St. Croix: The Intersection of Clay Sourcing Analyses and Afro-Crucian Heritage*

From 2016 to 2019, excavations at Christiansted National Historic Site on St. Croix, US Virgin Islands associated with the Slave Wrecks Project, have resulted in the collection of thousands of artifacts associated with the Danish West India and Guinea Warehouse Complex (AD 1749 to circa AD 1854). This assemblage contains hundreds of Afro-Caribbean colonoware, often referred to as Afro-Crucian ware. Former analyses have developed and expanded the initial ware typology, but questions concerning the origin of production remain. This presentation will assess the results of clay sourcing methods used to reevaluate the typology and function of Afro-Crucian ware. These analyses sought to determine whether these wares were produced locally or were products of importation, thus indicative of potential interaction spheres between various Afro-Caribbean communities throughout the Antilles. These results further illuminate how Afro-Crucian ware represents the cultural and economic perseverance of Afro-Crucians through ceramic production, despite colonial oppressive conditions.

**Greaves, Aspen (University of Pittsburgh)****[103]***Archaeological and Ethnographic Plant Use in Mongolia*

The history and prehistory of Mongolia and Central Asia is sometimes characterized as static nomadic pastoralism, with little to no change in resource use over hundreds of years. Many scholars have debunked this unnuanced image by showing the complexities of pastoral lifeways, as well as the adoption of other subsistence strategies in areas traditionally thought to be 'purely' pastoralist. One line of evidence helpful in this argument is the pastoralist use of plants, both wild and domestic. The increasing prevalence of taking flotation samples and identifying macrobotanical remains at archaeological excavations in Central Asia provides a broad timescale and geographic spread of domesticated plant use, particularly free-threshing wheat (*Triticum aestivum*) and broomcorn millet (*Panicum miliaceum*). In addition to the domesticated food crops, there is ample ethnographic evidence of wild plant use in modern-day Mongolia. Wild plants are used for food, medicine, animal fodder and construction materials, all uses that could potentially be found in the past. This poster compares the archaeological analysis and spread of macrobotanical remains in Central Asia broadly and Mongolia specifically to the ethnographic uses of plants in modern Mongolia to elucidate the similarities and differences over time, as well as potential areas for future paleoethnobotanical research.

**Greaves, Russell (Office of Contract Archeology, University of New Mexico) and Karen Kramer (University of Utah)****[50]***Ethnoarchaeology of Pro-sociality: Frequent All-Night Dances May Help Foster Hunter-Gatherer Cooperation in Impoverished Environments*

We investigate the pro-sociality of frequent cultural dances among a group of South American hunter-gatherers living in an impoverished environment. Savanna Pumé foragers of the llanos of Venezuela hold 11-hr night dances 36% of all nights sampled during 30 months of ethnoarchaeological fieldwork. The Savanna Pumé live in a hyperseasonal environment with low densities and diversity of resources. Terrestrial game animals provide low returns during the six months of wet season; mean returns are ~2 kg/hunter/trip, mostly small game; and few men hunt each week. Resources from dry season fishing are returned in higher amounts and are shared more extensively. Fishing returns also average 2 kg/man/trip, but most men in camp fish every day. Foods contributed and shared by women are critical in all seasons. All-night community dances are equally frequent during the wet and dry seasons. We present information from observations of these dances, daily activity budgets, demographic and mobility data, and corollary experimental evolutionary psychology data on the pro-sociality effects of group participation in rhythmic activities. These suggest that Savanna Pumé hunter-gatherers engage in frequent community dances to promote cooperative subsistence efforts and sharing, and that dance may be a pro-social behavioral adaptation to this depauperate environment.

**Green, Adam (University of York), Iqtedar Alam (University of Cambridge), Claudette Lopez (University of Cambridge) and Cameron Petrie (University of Cambridge)**  
[142]

*Approaching (In)Equality in the Indus Civilization: A Preliminary Analysis of House Size at Mohenjo-daro*

The archaeology of South Asia challenges theories about the deep history of inequality, but data from its first cities are rarely included in comparative studies. This paper addresses this problem by presenting a preliminary analysis of spatial data produced by the early twentieth-century excavations at Mohenjo-daro. Mohenjo-daro was one of the cities of the Indus civilization (~2600–1900 BC). It had large nonresidential buildings, elements of civic planning, sophisticated craft technologies, and a complex agropastoral economy with long-distance connections to contemporary societies, but qualitative evidence for a ruling class is lacking. To understand whether this conspicuous absence of “elites” manifests in other categories of material culture, we digitized first-edition excavation reports produced by the major excavations at the site in the 1920s and 1930s, and vectorized architectural plans using a combination of highly precise GIS-based methods. Drawing on spatial syntax theory, we have retheorized the Indus house by testing methods designed to more clearly differentiate public and private spaces. These data were used to prepare Gini coefficients, shedding light on quantitative wealth differences at Mohenjo-daro, making it possible to compare the cities and settlements of the Indus Civilization to other early societies as part of the Gini Project.

Green, Ashley [92] see Montenegro, Alvaro

Green, Ed [94] see Oppenheimer, Jonas

Green Mink, Kirsten [72] see Pascali, Pamela

Greene, Richard [81] see Poister, Nicholas

**Greening, Victoria (Stony Brook University), Ludovic Slimak (University of Toulouse), Jason Lewis (Stony Brook University) and Svenya Drees (Stony Brook University)**  
[70]

*Fast Fashion? Pelt Procurement in the Late Pleistocene at le Grand Abri aux Puces, France*

The origins of hominins using animal pelts as body covering, i.e., clothing, is an important adaptation to reconstruct. Throughout history, our hominin ancestors have adapted to living in temperate and glacial climates, as well as expanding into novel environments, like the Neanderthals in Europe over the past 300,000 years. However, there is currently no evidence that Neanderthals used needles or other tools to tailor tight-fitting clothing like later Upper Paleolithic modern *Homo sapiens*, and their sites have significantly fewer remains of the species that are most frequently targeted for their pelts (canids, leporids, and mustelids) than modern human sites. Le Grand Abri aux Puces (GAP), a site in Mediterranean France that dates between 125,000–90,000 years ago, could provide insight into this gap in knowledge. Preliminary research at GAP has provided evidence of cutmarks indicating pelt removal from beaver and lynx. This study undertakes a more thorough zooarchaeological analysis of the faunal remains from the rest of the GAP sequence in order to reconstruct if and how the hominins there were acquiring pelts, how this behavior compares to other signatures from the region, and the implications for hominin survival during the Late Pleistocene.

Greening, Victoria [122] see Drees, Svenya

**Greenwald, Alexandra (University of Utah), Mary Weahkee (Santa Clara Pueblo; New Mexico Office of Archaeology), Hayley Kievman (University of Utah), Andrew Merryweather (University of Utah) and Jamie Herridge (University of Utah)**  
[232]

*Ancestral Puebloan Running and Walking Biomechanics*

Running is an important, and even sacred, cultural practice among modern Indigenous peoples of the western North America and has deep roots in prehistory. Oral history and limited archaeological evidence suggest that running was important in ceremonial contexts, communication between communities, in hunting practices, and warfare. However, the prehistoric prevalence and participation rates in running are poorly documented due to a paucity of direct evidence preserved in the archaeological record. Additionally, biomechanics of ancient minimally-shod runners are not well-documented. Our paper presents data from an on-going experimental archaeology and human subjects study aimed at reconstructing the biomechanics of running and walking using replicas of prehistoric yucca fiber sandals. Motion capture data, paired with data from instrumented insoles and treadmills, collected from minimalist runners running and walking while wearing replica yucca fiber sandals are used to generate use-wear predictions. These predictions regarding wear accrued during running and walking are then compared to use-wear patterns analyzed from 3D scans taken from the Natural History Museum of Utah's collection of ~375 prehistoric yucca fiber sandals from across the Great Basin, Colorado Plateau, and Southwest to generate predictions regarding the running and walking biomechanics of the prehistoric occupants of those regions.

Greenwald, Alexandra [29] see de la Rosa-Martinez, Marcos

Greer, John [241] see Greer, Mavis

**Greer, Matthew (University of Missouri Research Reactor)**  
[138]  
*Chair*

**Greer, Matthew (University of Missouri Research Reactor)**  
[138]

*Whiteness in Relation: Black Studies and the Racializing Assemblages of the Antebellum South*

For decades, Black Studies scholars have provided powerful, far-ranging critiques of the concept of race and the processes of racialization. Yet, when applied to archaeological case studies, these concepts are often only used to discuss the lives of Africans and their diasporic descendants. However, as Black Studies scholars point out, their work also applies to whiteness and Indigeneity—creating a multifaceted set of theories that archaeologists can use when discussing racialization writ large. Drawing on Édouard Glissant's concept of "relation" and Alexander Weheliye's discussions of racializing assemblages, this paper applies Black Studies scholars' perspectives on race to the study of whiteness in the Antebellum South, showing new areas where archaeologists can engage with Black Studies.

**Greer, Mavis (Greer Archeology) and John Greer (Greer Archeology)**  
[241]

*The Buffalo Creek Site: Animal and Human Rock Art Diversity in Northern Wyoming*

A small sandstone rockshelter overlooking Buffalo Creek in the southeastern foothills of the Bighorn Mountains has been of interest to researchers since the 1960s due to its shield-bearing warriors, but they account for only a few images at the site. Several different animals here include elk, bears, and mountain sheep, and most are shown pierced by spears or arrows. A circular corral was placed among the biggest group of animals, presumably after the animals were already depicted. Hunting is not the only theme as there are several grooves of various sizes and shapes as well as a group of women on their own panel. Shield-bearing warriors are not associated with battle scenes but instead appear to be portraits. Styles of humans and animals indicate they were made over time by different people, and Native American use extends at least from the pre-horse Late Prehistoric period. Later Anglo names begin at least by 1904.

**Grier, Colin (Washington State University)****[92]***Discussant***[92]***Chair***Grier, Colin (Washington State University)****[233]***Binaries, Landforms, and Clam Gardens on the Northwest Coast of North America*

The imposition of colonial authority throughout the Indigenous Northwest Coast of North America brought with it two long-standing western binaries—agricultural/not and natural/anthropogenic. Within these, Northwest Coast peoples were viewed as not agricultural (useful for alienating them from land) and in a state of nature, by extension incapable or unwilling to transform the natural world in any meaningful way. Both binaries were used (inappropriately) to pigeonhole the complex relationships between Northwest Coast peoples and the geophysical world. Importantly, this frame was mobilized by anthropologists in their ethnology and archaeologists in their methodologies for describing and interpreting the archaeological record. In this paper I discuss how Indigenous relational ontologies and archaeological data are pushing back against this. Landscape data from coastal spit sites in southwestern British Columbia illuminate complex human-earth engagements that blur tidy categorizations of archaeological deposits as either natural or anthropogenic. Stone-walled clam gardens expose how human and nonhuman persons were seamlessly interdigitated with coastal geologies. Such observations confront long-standing binaries conceptually but also politically, as they underscore how modern renegotiations of aboriginal treaty rights and title must jettison anachronistic binaries to engage in meaningful conversation toward reconciliation and restorative justice.

Grier, Colin [177] see Baley, Tyler

Grier, Colin [177] see Blumhardt, Cameron

Grier, Colin [92] see Garcia-Piquer, Albert

**Griffin, Dennis (Cultural Horizons)****[49]***Archaeology in the Bering Sea: Results from 25 Years of Periodic Archaeological Research on St. Matthew and Hall Islands, the Most Remote Area within Alaska*

St. Matthew and Hall Islands are located in the Bering Sea, far from the Alaskan mainland. Located within the Bering Sea Wildlife Refuge, these uninhabited islands are visited by refuge biologists about once every five years for an approximate 8–10-day period, in order to conduct studies of island fowl and fauna. Since 1997, the Refuge has sponsored an interdisciplinary team to accompany their biologists, including that of an archaeologist who sought evidence of past island human land-use. This presentation provides a summary of the results from the past 25 years of archaeological research including: a precontact Native habitation site, a Russian-Aleut hunting camp, numerous early twentieth-century fox trapping cabins, the site of a 1916 shipwreck survivor camp, and several sites associated with World War II military occupation.

**Griffin, Robert (University of Alabama, Huntsville), Kelsey Herndon (University of Alabama, Huntsville), Heather Hurst (Skidmore College), Franco Rossi (Massachusetts Institute of Technology) and Boris Beltran (San Bartolo-Xultun Regional Archaeological Project)****[125]***Remote Sensing of Constructed Landscapes in Northern Guatemala*

The Maya sites of San Bartolo and Xultun, Guatemala, provide compelling evidence for ancient Maya agricultural interventions and shifting perspectives about the regional ecological landscape. The first line of evidence is visual: murals there catalogue political and religious narratives that were centrally concerned with ecological processes and their associated food and water systems that sustained human settlement in the region. By the Classic period, rulers of the region cast themselves less as intermediaries with divine forces (as

during the Preclassic), and more as divine forces in and of themselves to which nature was subject. Thus, the visual record bookends an era of massive political, economic, and social change across the region, revealing shifts in how rulers in the San Bartolo-Xultun region positioned themselves to the public in relation to natural forces and the divine. This relationship is indicated by our second line of evidence: more than a millennium's worth of archaeological data about long-term productivity of agricultural landscapes and constructed niches, provided through the use of a spatially explicit crop model (GridSSAT) parameterized by optical satellite imagery and lidar aerial datasets, further highlighting the evolving landscape-scale and process-focused applications of remote sensing in archaeology.

Griffin, Tristen [183] see Powis, Terry

**Grindle, Dalyn (Harvard University)**

[94]

*Elk in the Rockies: Interweaving the Ethnographic Present and the Archaeological Past toward More Thoughtful Animal Management*

Modern land management in the North American West, including issues like species conservation and cultural resource preservation, is difficult to navigate. Even though both are pillars of land management, the worlds of species conservation and archaeology do not often overlap—though both fields could benefit. The archaeological record has much to offer in terms of contextualizing and extending the time depth of our modern understandings of species population numbers, ranges, and interactions with humans. Modern and (ethno)historic conservation and population management methods could provide illumination into archaeological questions. Integrating the two could lead to a more thoughtful, place-based approach to land management. I explore the ways in which melding these two fields may work in practice using a case study of elk (wapiti, *Cervus elaphus/canadensis*) in the Wyoming Rockies as a part of my PhD research. While elk do not seem to conventionally appear in the archaeological record, they are present iconographically and through ornamentation and tools. They are deeply represented in the ethnohistoric record. Elk have long been a particularly salient feature of conservation in the West and are currently facing tough crossroads. An integrative approach to their management may be a creative way forward.

**Grossman, Kathryn (North Carolina State University) and Tate Paulette (North Carolina State University)**

[49]

*Society against the State in Prehistoric Cyprus? Exploring the Politics of Village Life*

Despite decades of critique, the study of early state formation remains bound up with an evolutionist narrative that situates the state as the natural endpoint of sociopolitical development. It is clear, however, that alternative political projects and trajectories were not only possible but common in the human past. Particular attention has been drawn to societies that were specifically structured to avoid following the path of state formation or being subsumed by expanding states. These “societies against the state” proved successful and durable forms of sociopolitical organization. The earliest known case of state formation—in SW Asia during the fourth to third millennium BC—now appears to have taken place within a regional context that included resistance to the process. This paper explores the possibility that an early society against the state was flourishing on the island of Cyprus, adjacent to the classic zones of early state formation in SW Asia. We use our own work at the site of Makounta-Voules-Mersinoudia to open up a series of questions about the nature of society in prehistoric Cyprus and to consider the kinds of data that will be needed to answer these questions.

**Grubb, Richard (Richard Grubb and Associates Inc.)**

[156]

*Discussant*

**Gruber, Anya (University of Texas, Austin), Amy Fedchenko (Northeast Archeological Resources Program) and Mikala Hardie (Northeast Archeological Resources Program)**  
[18]

*Bringing Archaeology to You: Insights from the Roving Exhibit and Archaeology Laboratory*

One of the most important aspects of the National Park Service is to preserve the “cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations.” However, cultural resources—including archaeological sites—are often inaccessible to the public. In order to promote equity by making archaeology in the National Parks more accessible, the Northeast Archeological Resources Program (NARP) developed the Roving Exhibit and Archeology Laboratory (REAL) with funding from a National Park Foundation grant. REAL is a traveling pop-up with hands-on activities introducing concepts like excavation, survey, cataloging, and paleoethnobotany. The goal of REAL is to bring tangible educational opportunities to learners through outreach events at parks, as well as in schools, libraries, and summer camps, presenting a unique way to engage with the public and highlight underrepresented histories. NARP brought REAL to five locations in the Northeast during the summer of 2022. In this talk I will discuss insights from the 2022 REAL deployments and how this initiative promotes meaningful connections between archaeologists, parks staff, and learners of all ages.

Gruenthal-Rankin, Ariel [30] see Gaddis, Katherine

Grunewald, Olivia Sage [201] see Genord, Kayla

Gruntorad, Kelsey [214] see Burke, Chrissina

**Gruver, Steph (University of Florida)**  
[103]

*Paleoindian Shellfishing and Feminist Agency at Quebrada Jaguay-280*

Occupants of the southern Peruvian site of Quebrada Jaguay 280 (QJ-280) maintained consistent preferential resource procurement practices for 4,000 years, from ~12,000–8,000 cal yr BP. Site deposits demonstrated that hunter-gatherers focused on capturing two fish species and one mollusk, *Mesodesma donacium*. Such intense specificity conflicts with behavioral ecology, and optimal foraging theory as this practice requires considerable time and rejection of numerous other species. Similar procurement patterns have been demonstrated by the Anbarra women of Australia. Anbarra women leave their beaches and travel hours to another to collect one specific shellfish despite locally having access to dozens other. Ethnographies report they make the journey both for the shellfish and to have alone time from men. Innumerable ethnographies demonstrate that shellfishing has largely been performed by women. Women have had the chance to freely socialize with other women away from a male gaze. If men were fishing, women would have been left alone to wander the beaches for hours for shellfishing, as seen in the Anbarra case. As there are no other documented contemporary cases with similarly low diversity deposits, QJ-280 may have been associated by early hunter-gatherer women as a space in which they had pronounced agency and freedom.

Guan, Ying [29] see You, Sen

Gubbels, Kevin [239] see Homsey-Messer, Lara

**Guderjan, Thomas (University of Texas, Tyler) and Colleen Hanratty (University of Texas, Tyler)**

[17]

*Large-Scale, Upland, Landscape Modification and the Implications for Classic Maya Population Density and Land Tenure in Northwestern Belize*

Lidar data from the 2016 survey and subsequent ground truthing and fieldwork in the settlement zone of the site of Xnoha have revealed a complex system of Linear Stone Boundary Markers surrounding house lots in residential areas surrounding the central precinct of the site. These are located on the tops of hills located to the North, East, West and South of the hill where the central precinct is located and generally termed “The NEWS.” At the bases of these hills are agricultural terraces and in the adjacent lowlands are ditched agricultural fields. In this paper, we examine the projected population density and access to local resources. Our data indicate that population size and density were much higher than anticipated and that residents had access to significant resources in their solarés as well as additional resources located proximally to the NEWS residential groups.

Guderjan, Thomas [129] see Hanratty, Colleen

**Guðmundsdóttir, Lísabet (University of Iceland) and Morten Ramstad (University Museum in Bergen)**

**[173]**

*Disappearing Past: Seasonal Coastal Settlements in NW Iceland (Ninth–Fifteenth Centuries)*

Throughout the settlement of Iceland there has always been a dependence on marine resources. Furthermore, studies have shown marine resources were being utilized far inland, indicating exchange networks from the start of the settlement period. However, there is a research bias within Icelandic archaeology, which has been described as “farm-centric,” where the importance of coastal sites and marine resources has been underrepresented. Due to climate change, coastal erosion is one of the greatest threats to Icelandic maritime archaeological sites. The majority of them are also related to acquisition of marine resources. Many of the maritime sites are seasonal specialized settlements with associated structural remains such as middens, boathouses, blubber melting pits, and facilities for fish production. In this project we have surveyed and recorded coastal sites in NW Iceland that are in various degrees of threat due to coastal erosion. One of the goals of this ongoing project is gaining as much knowledge as possible about these sites before they disappear completely. In this talk, I will discuss the preliminary results of our research to address the evolution of maritime technology, socioeconomic frameworks, and the living conditions in these seasonal settlements during the Viking Age and medieval period.

Guerra, Rafael [129] see Ebert, Claire

Guerrero, Isabelle [25] see Dillingham, Frederic

**Guevara-Duque, Maria Isabel (University of Illinois, Chicago)**

**[42]**

*Obsidian: Status Marker or Household Item? The Use of Obsidian throughout Time in Manabi, Ecuador*

The use of obsidian in the Andes is widespread and constant starting during the Formative period. Through the morphological analysis of lithic artifacts recovered during excavations in northern Manabi, Ecuador, this poster reveals the importance of obsidian in the area and how it changed throughout time. The Matapalo site, the focus of this research, shows evidence of two settlements that date to different periods and present a significant quantity of stone artifacts collected in contexts associated with the Valdivia (1500–500 BCE) and Jama-Coaque (500 BCE–500 CE) cultural groups. These tools were created with various raw materials, including obsidian. Considering obsidian is not a local raw material, it likely arrived in the area through a trade network. This analysis, which uses a classification method based on morphology and the operational chain, seeks to determine the function of obsidian, the form it arrived on site, and the changes in procurement, production, and use patterns in the area through time.

Gunchinsuren, Byambaa [55] see Gillam, J. Christopher

**Gunn, Joel (University of North Carolina, Greensboro) and Lynda Florey Folan (Centro de Investigaciones Históricas y Sociales)****[204]***William J. Folan and the Climate Fascination*

We recall the moment that William J. Folan was struck by the Climate Fascination. In 1978 he had a visiting professorship at the University of Texas, San Antonio and we were sharing an office. He suggested that JDG should do an article on Maya Lowlands climate change. JDG responded that Willie was the expert who should do that. It was like a light went off in his bald head. He prepared “Paleoclimatological Patterning in Southern Mesoamerica” that was published in the *Journal of Field Archaeology* in 1983. He discovered that measured by high-latitude glaciers, world cooling caused the lowlands to experience a series of historical droughts, wars, and famines. WJF proposed the Calakmul Biosphere Reserve in 1992 and obtained a Secretaria de Desarrollo Social grant to prepare the Management Plan. Using modern data, we studied local variations of climate published in 1995 *Geoarchaeology* as “A Landscape Analysis of the Candelaria Watershed . . .”, and in 2000 “Three Rivers in Campeche . . .” Causes of local variation differed from solar variation in the Candelaria to El Niño in Essequibo, Guyana, and deforestation at Champotón. Our presentation follows WJF’s key insights into global changes and Mesoamerican impacts.

Gunn, Joel [204] see Torrescano-Valle, Nuria

**Gunnels, Jesse****[187]***Discussant***Gunnels, Jesse****[18]***Military Land Management*

Military lands have evolved over the years, beginning as coastal defenses and outposts on the frontier, to major military installations that are small self-contained cities. Beyond their significance for national security and training, these lands contain natural and cultural resources that present unique challenges in terms of management and sustainability. Further complicating the issue, management practices have been contested both in the US and in other countries, by the public and other interest groups. Consequently, varying perspectives have emerged about their legitimacy, control of space, and related land use issues for surrounding communities. This presentation addresses these topics and explores some of the management practices that include stakeholder groups, cultural resources managers, and concerned citizens.

**Gunter-Bassett, Madeleine (William & Mary)****[75]***Pastoralist Land Use and Mobility in the Horn of Africa: An Archaeological Predictive Model*

Archaeological Predictive Models (APMs) are a critical tool for archaeologists working across the globe; however, they are underutilized in continental Africa. As part of ongoing archaeological research in Djibouti, the Southeast Djibouti Regional Archaeological Project (SEDRAPProject) developed an ArcGIS-based APM for pastoralist sites in the eastern Horn of Africa. The SEDRAPProject APM uses three weighted ecological variables related to pastoralism to categorize areas of the eastern Horn as conducive, somewhat conducive, or less conducive to animal herding—and, by extension, to predict high-, medium-, and low-probability areas for finding pastoralist archaeological sites. This poster presents a discussion of the ecological variables that are included in the model, the results of model validation using Kvamme’s Gain statistic, and a mobility “case study” that uses the model as a cost surface for mapping least cost routes between coastal sites in Djibouti and Somaliland and interior sites in Djibouti, Somaliland, and Ethiopia.

Gunter-Bassett, Madeleine [30] see Bassett, Hayden

Guralnick, Robert [218] see deFrance, Susan  
Guralnick, Robert [114] see Rose, Autumn

Gusick, Amy [113] see Braje, Todd

Gustavsen, Lars [233] see Cannell, Rebecca

Guthrie, Logan [214] see Martisius, Naomi

**Gutiérrez, Gerardo (University of Colorado, Boulder)**

**[125]**

*Forgery of the Past: The Scientific Analysis of the Codex Cardona and the Assumed Lost Relaciones Geográficas of Coyoacán and other Villas of Mexico City during the First Half of the Seventeenth Century*

Multiple fragments of the so-called Codex Cardona began to circulate among street markets, boutique bookstores, and art galleries of Mexico City, the USA, and Europe between 1970 and 1980. It is estimated that this large format manuscript has 800 pages and 300 colorful plates describing key historical passages and geographic descriptions of the key towns and villages of Mexico after the conquest and during the first century of Spanish domination. Nevertheless, many scholars have expressed skepticism as to the authenticity of this mesmerizing mammoth-sized document. A recent controversy in Mexico has again raised this issue, as a Spanish gallery purchased one of these Cardona fragments and has recently sold it for US\$200,000. Upon the request of the Biblioteca Nacional de Antropología e Historia, INAH, I inspected and analyzed the materiality of one of the purported fragments of the Codex Cardona in Mexico with portable spectrometry. I present in this poster the results of these scientific analyses and a tale of caution about one of the most elaborate forgery schemes known for Mexican manuscripts.

**Gutierrez, Jonathan (University of Texas, Rio Grande Valley), Jean-Paul Rojas (Franklin and Marshall College), Cristian Figueroa (University of California, Berkeley), Ana Maria Morales (Universidad Nacional de San Martín) and Angie Farfan Garcia (FLACSO Ecuador)**

**[237]**

*Heritage Conversations with Dos Mangas*

Archaeological investigations in Dos Mangas began in 2006, and continued with excavation of a Valdivia village site, Buen Suceso, in 2009, 2017, 2019, and 2022. Those and subsequent excavations have combined archaeological inquiry with community engagement activities such as presentations in the primary school, workshops for community guides, and presentations at community meetings. This paper presents the results of community heritage discussions in 2022 conducted through a series of interviews and workshops with longtime residents of Dos Mangas. These discussions and oral histories provide an intimate insight into important topics and issues faced by the community, both in the past and the present. These include access to clean drinking water, religious practices, agricultural production, migratory patterns, the importance of protecting the environment, the development of a community museum, and the role of eco-tourism in the community. These discussions also provide a roadmap to understanding community relationships with Buen Suceso and the rivers Culebra and Colín overtime. Finally, utilizing these discussions and oral histories as well as some GIS multispectral imagery work, we lay the foundation for a collaborative written history of the community and its dynamics with the environment and archaeological past.

**Gutierrez, Maria (CONICET, INCUAPA)**

**[5]**

*Discussant*

**Gutiérrez Ruano, Patricio (University of Montana), Ava Godhardt (University of Montana), Meradeth Snow (University of Montana) and Michael Mathiowetz (Independent Scholar)**  
[102]

*Ancient Migrations in the Aztatlán Region: aDNA Analyses*

While mounting evidence suggests that the Aztatlán tradition in west Mexico was a major cosmopolitan region during the Postclassic period (AD 900–1521), archaeologists have characterized items and beliefs as being culturally distinct from the rest of Mesoamerica. Recently, endogenous and exogenous material culture distribution has been interpreted as the movement and exchange of goods and ideas between Aztatlán subregions and surrounding areas through physical interaction and/or trade. Hypothesized socioeconomic interaction networks range as far north as the US Southwest/Northwest Mexico and southeastward to southern Mesoamerica and beyond. While current macroregional population models for this geographic region focus on material exchanges, the question of geneflow along proposed interaction networks has not been addressed. Genetic information from skeletal remains disinterred during excavations in the 1950s to 1960s offers insight on population dynamics and regional connectivity. This poster discusses the first use of mtDNA analyses and genetic biological sex estimations of these skeletal remains to assess factors that shaped genetic variation at sites within the Aztatlán core zone (Amapa and Peñitas) and adjoining highlands (Tizapán El Alto). This research, which highlights the benefits of international collaboration, has obtained all permissions necessary from the Mexican government and museum housing the human remains.

**Guzman Garcia, Milena (Universidad Nacional de Trujillo), Sintia Santisteban, Michelle Watanave and Aldo Watanave (University of Florida)**  
[70]

*Identifying Use and Consumption Patterns through a Quantitative, Qualitative, and Comparative Analysis of Mollusks at Huaca Menocucho, Moche Valley, Peru*

Excavations at Huaca Menocucho in the Moche Valley, Peru, revealed occupation sequences from the Initial period to the Middle Horizon with large amounts of malacological remains. Quantitative, qualitative, and comparative analyses are being conducted to interpret the role of gastropods, bivalves, and other mollusks at the site. A quantitative analysis will calculate the malacological material registered in order to determine which marine species were the most consumed, which predominated during each occupational level, how they were utilized, and how these marine resources arrived to the middle Moche Valley. A qualitative analysis will classify diagnostic shells based on taxonomy to identify use patterns of whole, fragmented, burned, pigmented, and cut shells of each species present. Finally, a comparative analysis will be drawn with other sites of the valley. Our current hypothesis indicates that marine resources were processed at the site for consumption and subsequent reuse for nonfood purposes. While some malacological remains appear to be local, marine mollusks likely arrived to the site through trade networks. Environmental changes and intravalley network variations would have altered the predominance of marine species in the area during each occupational level.

**Guzman Piedrasanta, Melvin Rodrigo (University of Central Florida)**  
[165]

*Settlement Pattern and Land Use at Holtun, Guatemala*

In Maya archaeology, agricultural cycles are the cornerstone of multiple research topics that intertwine daily life, ideology, political economy, and settlement systems. In archaeological research, land use can be indicative of social organization and provisioning strategies. In this regard, research conducted in the modest-sized site of Holtun contributes to the growing body of land management research in ancient Maya archaeology. Holtun developed social complexity during the Middle Preclassic period and cultural activities remained through the Terminal Classic period. The site is located in an elevated terrain surrounded by ravines. Although the landscape lacks a significant body of water, the geomorphology includes several freshwater springs, still-water pools, and water reservoirs. The site of Holtun adapted to this unique landscape and the cultural settlement depicts patterns of social organization and status. A geospatial analysis of the landscape of Holtun indicates that some portions within the perimeter of the site have the geographical characteristics to facilitate milpa

agriculture. Furthermore, the inhabitants of the adjacent village of La Maquina, colonized in the 1960s, have also deemed some of these areas ideal for the practice of agriculture. Besides archaeological research, the modern use of the land is an indicator of the provisioning potentials of the landscape.

Gyucha, Attila [121] see Nuccio, Victoria

**Haas, Randy (Wayne State University), Eric Dillingham (Humboldt-Toiyabe National Forest [retired]), Debbie Lundy (Bridgeport Indian Colony), Nicholas Tripcevich (UC Berkeley Archaeological Research Facility) and Mikayla Rosario (University of California, Davis)**  
[8]

*The Strength of Deep Ties: Obsidian Provenance Suggests Long-Distance Cooperation over Six Millennia in Numu Territory*

Scholars have suggested that economies of scale gained from cooperative hunting fueled the evolution of human sociality. This model anticipates inflated levels of cooperation during group-hunting events in comparison to other contexts. To evaluate this prediction, we examine the provenance of 395 obsidian projectile points from the large communal hunting complex of Tunna' Nosi' Kaiva' Gwaa in Numu (Northern Paiute) territory, Humboldt-Toiyabe National Forest, Nevada. Consistent with the model, we observe evidence of long-distance interaction extending up to 100 km and spanning six millennia. Inconsistent with the model, we observe that the level of interaction at the TNKG communal hunting complex was no greater than levels observed at other site types. Numu world views offer a parsimonious explanation in which routine cooperative interactions were embedded in systems of generalized reciprocity that have always connected the Numu in expansive social networks.

Haas, Randy [97] see Chen, Jennifer

Haas, Randy [160] see Snyder, Thomas

**Habu, Junko (University of California Berkeley)**  
[16]

*Jomon Landscape Practice and Ecological Resilience in Prehistoric Japan*

This presentation argues that the resilience of the food systems during and after the Jomon period (ca. 16,000–2500 cal BP) in prehistoric Japan must have been closely related to the diversity of staple foods, settlement locations, and methods of landscape management including the use of fire. Despite an abundance of shell-middens, the majority of Jomon settlements are located on top of hills, not in the lowlands. While recent molecular and isotopic investigations of pottery highlight the possible importance of marine food for the Incipient Jomon period, archaeobotanical analyses and stable isotopic analyses indicate that most residents of Early–Final Jomon (ca. 7000–2500 cal BP) sites are likely to have been heavily reliant on starchy foods from the forest, including chestnuts, acorns, and buckeyes. Contributions of ethnohistory and agroecology are critical to developing a model of long-term resilience in Jomon foodways against disasters and climate change in relation to multi-stability of ecosystems.

**Hackenberger, Steven (Central Washington University), Emily LaPlante and Rylee Chadwick (Central Washington University)**  
[121]

*Activity Area Analysis of the Sanders Site (45KT315), 3–4 Kya Yakima Uplands, Washington*

LaPlante recently led a new study of the Sanders Site (45KT315) collection. Excavated in the 1970s, the site is located within the Yakima Uplands of the Middle Columbia River. This is the sixth thesis or research scholarship study of Dr. William Smith's legacy collection, and one of two dozen similar student projects focused on four CWU collections from regional sites. The site was occupied from as early as 10,000 years ago; however, the heaviest occupation dates between 4,000 and 2,800 years ago (Frenchman Springs Phase).

Six new AMS radiocarbon dates are reported for bone samples. Small leaf-shaped bifaces (“dart points”) and contracting stem arrow points are associated with bone cooking features (including Bighorn). Freshwater mussel shell and the relative frequencies of four rodent species indicate relatively cool/moist conditions.

Hackenberger, Steven [27] see Biggs, Harley

**Hadden, Carla (Center for Applied Isotope Studies, UGA) and Katharine Napora (Florida Atlantic University)**

[74]

*Applications of Wiggle-Match Dating in North American Historical Archaeology*

Wiggle-match dating (WMD) of tree-ring sequences facilitates high-resolution radiocarbon dating in historical archaeology, a period notorious for an imprecise radiocarbon record. We demonstrate the application of WMD in historical archaeology with two case studies: (1) a cypress dugout logboat exhibiting a unique combination of European and Native American design elements; and (2) a tulippoplar wood trough utilized by an enslaved workforce in the production of saltpeter. From each object, multiple individual tree rings were sampled from exposed, rough cross-sections in the wood, with no or minimal surface preparation, to preserve these fragile objects. The samples were radiocarbon dated by AMS. To account for uncertainty in ring counts, the resulting dates were modeled in OxCal using the Sequence and Interval functions, rather than the D\_Sequence and Gap functions that are more commonly used in wiggle-match dating. By this method, we dated the outermost tree ring of each object to within 30 years: the logboat to 1766–1796 cal AD, and the trough to 1778–1804 cal AD (95% highest posterior density range). This study demonstrates that in some cases, high-precision dating can be achieved for eighteenth–nineteenth-century objects through wiggle-match dating, with minimal damage to the objects of study.

Hadden, Carla [245] see Cramb, Justin

**Haefner, Joseph, Steven Sarich (TRC Environmental Corporation, Austin, TX) and Benjamin Johnson**

[72]

*Preliminary Results of Metal Detector Survey at Fort Lancaster, Texas*

On behalf of the Texas Historical Commission and the Fort Lancaster State Historic Site (FLSHS), archaeologists from TRC Environmental Corporation conducted a systematic metal detector survey of an 11.4-acre parcel expansion of the current FLSHS boundaries, with funding provided by the National Park Service. In addition, TRC archaeologists were tasked with intensive review of existing historic and archival records, as well as any literature and archaeological technical reports associated with the FLSHS and surrounding area. The focus of the investigation, beyond contributing to the broader history of the FLSHS, was to gain a better understanding of the December 26, 1867, battle between the Kickapoo Native Americans and the African American Company K, 9th US Cavalry Regiment garrisoned at the Fort. The proposed poster will discuss the methodological approach to the systematic metal detector survey, including comment on what worked well in a rocky and mesquite stand environment, as well as what did not, with comment on best practices for future similar projects. In addition to an examination of the methodology, this poster will present preliminary results of findings as they relate to the above-noted battle and other historic periods of fort occupation.

**Haffner, Jacob (University of Oklahoma), Keith Prufer (University of New Mexico), Hannah Mattson (University of New Mexico), Cecil Lewis (University of Oklahoma) and Colleagues et al.**

[43]

*Mass Spectrometry Database of Archaeologically Relevant Plants for Organic Residue Analysis*

Organic residue analysis in archaeology using mass spectrometry (MS) is a robust technique to detect and explore ancient biomolecules for reconstructing past cultural behavior, such as diet composition and even

specific recipes. Studies often involve targeted MS analyses of known or suspected substances, while untargeted analyses characterizing broad ranges of molecules are less common despite their potential to identify unexpected compounds. Regardless of approach, residue studies depend on the quality of reference samples in metabolomics databases, especially with regard to dietary substances like plants, but such reference collections are rarely accessible. This project bridges this gap by generating an untargeted MS-based metabolomics dataset of wild and domesticated plant species from the Americas with significance to Indigenous communities, as well as Old World plants. Through generating novel high-quality public plant references from different spatial and temporal contexts, other researchers can compare their unknown samples against our data, increasing molecules identified from plant residues. Moreover, the multiregional structuring of the plant database allows archaeologists to provide more contextualization to analyses without biasing results to a single region. These data also create opportunities for researchers to explore deeper questions about past and present plant use, regardless of experimental conditions or archaeological context.

Hagerty, Summer [122] see Firenzi, Alexandria

**Haines, Julia (Cornell University)**

[217]

*Chair*

**Haines, Julia (Cornell University)**

[217]

*Diasporic Tensions of Historical Framing and Material Process in Mauritian Archaeology*

This paper examines the tension between historical framing and material process in the context of colonial labor migrations, using archaeology of domestic and settlement landscapes in nineteenth-century Mauritius as a case study. Historical archaeology has the benefit of being able to trace the movement of people through multiple literary, oral, and material sources. Historical archaeologies of diaspora have tended to tack between quantitative studies of imported and locally made goods and qualitative studies that draw analogy to specific diasporic homelands, despite the diverse geographic origins of immigrants. While nineteenth-century Mauritius is historically framed by French and British colonialism, encompassing agro-capitalism and exclusionary landownership, we must not forget that the majority of the colony's population were enslaved and indentured laborers in diaspora. I argue that the island landscape and its material record were shaped more by diasporic people than settler colonizers, and that we have the luxury of taking the presence of such populations as fact rather than complicating the methodology of "identifying" diaspora. Doing so allows us to ask key questions about non-Western material identity practices and social boundary making that we might otherwise miss when relying on historical colonial framings.

Hainsworth, Lauren [97] see Cole, Kasey

Halcrow, Sian [102] see Arriaza, Bernardo

Hale, Micah [21] see Brady, Ryan

Hale, Nathan [197] see Cook Hale, Jessica

Halfman, Carrin [15] see Potter, Ben

**Hall, Sarah (Arizona State University), Claudia Rojas-Sepúlveda (Universidad Nacional de Colombia-Sede Bogotá) and Kelly Knudson (Arizona State University)****[134]***Migration and Inequality: Using Biochemistry in a Historical Skeletal Assemblage from Bogota, Colombia*

Skeletal assemblages from the recent past present a valuable opportunity to contextualize bioarchaeological analyses with historical documentation. This study integrates historical and osteological data with analyses of multiple isotope systems to discuss inequality and migration within a sample of individuals ( $n = 120$ ) from a nineteenth- to twentieth-century skeletal assemblage from the public section of Cementerio Central in Bogotá, Colombia. Rural-to-urban migration in Colombia was common during this period, as many left oppressive labor relationships and civil conflict in the countryside to seek greater economic opportunities in the city. This study evaluates evidence of migration from a sample of individuals buried in the public cemetery in Bogotá and contextualizes these migration experiences using historical and osteological data. This project builds upon previous scholarship, which has explored the potential for the application of stable oxygen and radiogenic strontium analyses in Colombia. Here, environmental samples were analyzed to construct baseline strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) and oxygen ( $\delta^{18}\text{O}$ ) isotope values for Bogotá; human enamel samples were compared against this baseline to assess residence.

**Hallett, Emily and Jacopo Niccolo Cerasoni (Loyola University, Chicago)****[214]***Bone and Antler Organic Pressure Flakers*

Bone has been used as a raw material for a range of activities for at least two million years. The criteria for determining whether a bone was used—or shaped and then used—have been established by archaeologists following decades of experimental research. In contrast, the antiquity of using bone for pressure flaking stone is less well established, and the earliest evidence currently dates to ~120 ka in China and Morocco. By ~20 ka in Eurasia, the use of antler from cervids for pressure flaking stone is documented regularly. Experimental knappers prefer to use antler for pressure flaking to produce fine and delicate tools. Cervids are absent in Africa, apart from *Megacerooides algericus* and *Cervus elaphus barbarus* in North Africa. The lack of cervids and therefore antler in sub-Saharan Africa has led researchers to suggest that early humans used bone to pressure flake stone. Criteria for identifying bone and antler pressure flakers are largely absent in the literature. Here we present use-wear analyses on experimental bone and antler pressure flakers used to shape stone tools. We suggest that through taphonomic analyses, it is possible to identify bone and antler pressure flakers in the archaeological record.

**Halligan, Jessi (Florida State University)****[197]***What Is Going On with the Younger Dryas in Florida? Late Pleistocene Perspectives from the Aucilla Basin*

The Aucilla River basin in northwestern Florida contains 92 recorded sites with components predating 9000 cal BP, making it an excellent area in which to examine terminal Pleistocene and early Holocene landscape use. More importantly, some of these sites, all drowned terrestrial localities, contain strata with well-preserved organic materials in archaeological contexts, allowing us to create absolute cultural chronologies, re-create paleoenvironments, and discuss human subsistence strategies. Several of these underwater sites contain extensive terminal Pleistocene cultural components in a soil that has ages spanning the Younger Dryas and earliest Holocene and is located 4–6 m below the modern water line. Most of these soils contain multiple diagnostic artifact styles, indicating repeated reuse of key landscape localities, and providing some of the few radiocarbon ages in the entire southeastern US for several diagnostic styles. In 2022, a Suwannee point was found in association with numerous wood fragments, allowing the first absolute ages to be obtained for this type. The soils themselves illuminate the environmental conditions of the latest Pleistocene and earliest Holocene.

**Halling, Christine (Louisiana Department of Justice), Ryan Seidemann (Louisiana Department of Justice) and Frank Willis (Willis Engineering & Scientific LLC)**

[63]

*Tracking the Dead: Archaeological, GIS, and Geomorphological Approaches to Recovering Caskets and Human Remains after Hurricane Ida*

Hurricane Ida barreled ashore in southeast Louisiana as a category 4 tropical cyclone on August 29, 2021. The winds and storm surge caused massive damage to many of the coastal parishes, forcing evacuations, destroying homes and businesses, and displacing hundreds of Louisiana's dead from their final resting places. In the immediate aftermath of the storm, Louisiana's Cemetery Response Task Force, a multiagency working group led by archaeologists, was tasked with recovering the displaced dead. Using helicopters, cranes, side-scanning sonar, divers, and large amounts of heavy equipment, more than 200 sets of mostly casketed remains were recovered from terrestrial and aqueous environments in the storm's path. This study retrospectively reviews, using GIS technology, the transport of the caskets and remains using known points of origin and destination and compares those results against geomorphological wind and storm surge modeling to determine whether pre-storm assumptions can be applied in the future to better target remains recovery. Such probabilistic modeling could save time and funds by focusing post-storm search efforts and bringing faster and more complete closure to living descendants of the displaced dead who are often suffering both second grieving events as well as their own losses from the natural disaster.

Halling, Christine [155] see Seidemann, Ryan

**Halperin, Christina (Université de Montréal)**

[242]

*Ancient and Contemporary Maya Ruins as Living Landscapes*

Ruin studies allow one to see the past not as a fixed "thing" but as living landscapes that emerge from, enliven, and incorporate temporal dimensions, ancestors, and animating forces young and old, near and far. Furthermore, over the past two decades Mesoamerican scholars have increasingly recognized that ruins were an integral part of ancient Mesoamerican peoples' own experiences rather than just limited to contemporary engagements with a distant precolumbian past. This paper examines ruins in the Maya area from two interrelated perspectives, the notion of *k'exoj*, generational continuity through transformation, and *k'ax*, a living forest, both of which are useful for thinking about the temporality and animacy of ruins. Using case examples from archaeological sites in Petén, Guatemala, I consider the implications of incorporating Indigenous ontologies in the understanding and making of ruins. I argue that the living forest was always—and continues to be—a part of this process.

Halperin, Christina [11] see Flynn-Arajdal, Yasmine

Halperin, Christina [218] see Freiwald, Carolyn

Halperin, Christina [64] see Le Moine, Jean-Baptiste

**Hambrecht, George (University of Maryland, College Park)**

[173]

*Discussant*

**Hamilton, Derek (Scottish Universities Environmental Research Centre), Kerry Sayle (Scottish Universities Environmental Research Centre) and Katharine Steinke (University of Edinburgh)**

[134]

*A Multiscalar Approach to Mobility: Interpreting Sulfur Isotope Values within Relative and Absolute Chronological Frameworks*

In the past 10 years sulfur isotope analysis ( $\delta^{34}\text{S}$ ) has become increasingly employed to investigate the movement and mobility of prehistoric people and animals. While the questions can focus on the same type of

“one-off” movements often considered when using strontium and oxygen analyses to study human migrations or pastoral economies, the combination of sulfur analyses with different sampling approaches can yield novel insights into past movement of individuals and populations. This paper discusses some of the ways archaeologists can incorporate sulfur isotope analysis with radiocarbon chronologies, the relative dating associated with sampling skeletal elements that represent different times in an individual’s life, and even sequential sampling within an individual skeletal element. These approaches will be illustrated using data from both human and animal populations from Middle Iron Age (~400–200 cal BC) sites in southern Britain.

Hamilton, Derek [82] see Lohse, Jon

**Hamilton, Marcus (University of Texas, San Antonio)**

**[137]**

*Toward a Bayesian Epistemology of Anthropology and Archaeology*

To date, the “Bayesian Revolution” in archaeology has focused primarily on statistical inference: the move from hypothesis testing to credence building. Bayesian thinking extends far beyond the practicalities of statistical inference. Bayesian theory is about epistemology; it describes how we acquire knowledge of the world by reducing the uncertainty of our predictions by updating prior expectations. We encounter the uncertain world and extract information from these interactions, which we then use to build inferences that make predictive models of that now less-uncertain world. We do this when we learn the layout of a new city, or when we make stone tools, or when we excavate a site, or when we model data. Importantly, this is no metaphor: mathematically, information is the reduction of uncertainty gained from an interaction. In this talk, I highlight how Bayesian inference is the natural language that bridges key concepts in anthropology, such as cognition, learning, and adaptation. Moreover, from a Bayesian perspective, the archaeological record is quite literally the embodied information of human-environment interactions in the past. Using examples of stone tool technologies in ethnohistoric hunter-gatherer societies, I show how Bayesian inference lies at the intersection of information theory, statistical inference, and anthropology.

Hammerstedt, Scott [99] see Regnier, Amanda

Hammond-Kaarremaa, Liz [245] see Lin, Audrey

**Hampson, Daniel (NMSU)**

**[46]**

*Living on the Spine of the World: Placemaking at Early Community Centers, Rincon, UT*

In southeast Utah, two of the most dominant geographical features, Comb Ridge and the San Juan River, converge in dramatic fashion. Several large villages at the intersection of these features represent central places for wider communities from 500 BCE through at least 900 CE. While the three largest sites represent different time periods, each maintained ritual structures, indicating that the location retained some spiritual importance between occupations. The presence of these three large communities and their ritual features at the intersection between Comb Ridge and the San Juan River may not be a coincidence. Both geographic features are important to indigenous people today and the deep history of occupation at their confluence may have manifested in a ritualized conception of the landscape. A better understanding of this process would provide insights into placemaking and the importance of landscape in the prehistoric Southwest. As the region continues to see increase in recreation and tourism, documentation of sites has become crucial for preserving their legacy. This project completed detailed architectural recordings, lidar imaging, and surface artifact sampling to give more context to the sites and explore their ritual organization without contributing to the disturbance.

**Hampton, Ashley (University of Montana)****[105]***Board Games, Gamification, and the Cultural Transmission of History: Constructing Narratives of the Past in Orthogonal*

How do we tell stories about the past? Historical-themed board games provide one such avenue for transmitting history. With the rise of independent publishers and crowdsourced publishing, recent opportunities to broaden the narrative and creative scope of these types of games have expanded exponentially. Since the act of gaming facilitates interactions across social boundaries, board games provide a unique method for shared heritage storytelling and knowledge transmission. This presentation therefore seeks to understand the different ways modern board games interpret history, typify or deviate from historical narratives, and ultimately gamify history in order to create shared knowledge about the past.

Hampton, Ashley [184] see Prentiss, Anna

**Hanks, Bryan (University of Pittsburgh), Gideon Shelach-Lavi (Hebrew University of Jerusalem), William Honeychurch (Yale University), Chunag Amartuvshin (Institute of Archaeology, MAS) and Marc Berman (University of Pittsburgh)****[24]***Frontier Dynamics in the Eastern Eurasian Steppe: Examining the Unique Characteristics of Long Wall Construction and Associated Defensive Features through Archaeological Geophysics*

The eastern Eurasian steppe region was a dynamic area of contact between Chinese dynasties and pastoral nomadic communities occupying the steppe ecological zone. Between the tenth and twelfth centuries AD the situation was even more complex as the people of nomadic or seminomadic origins established dynasties that ruled over Northern China and parts of Mongolia. Recent international field research has sought to better document and understand the characteristics of long wall construction and associated clustered structures within the region and to address how and why such monumental works were created. These studies have included the use of high-resolution satellite imagery, systematic drone mapping, GIS analysis, and targeted excavation of both the wall and associated structures. This paper details the results of geophysical surveys recently undertaken as part of this research and how such approaches can assist in better understanding structured responses to frontier dynamics and the creation of monumental landscapes that mediate the flow of human and animal populations. Alternative models of military organization related to the eastern steppe frontier zone will be presented. This case study provides a unique comparative perspective on early state expansion and the landscapes of conflict and political power they often generated.

Hanks, Bryan [244] see Schmaus, Tekla

**Hannold, Cynthia****[154]***Chair***Hannold, Cynthia, Aura Barrientos (Universidad de San Carlos de Guatemala), Alexandre Tokovinine (University of Alabama) and Francisco Estrada-Belli (Tulane University)****[154]***Teotihuacan Style in Maya Stone: New Evidence from La Sufricaya*

The Teotihuacan Entrada of 378 CE is one of the most archaeologically rich events in the Maya Lowlands. Systematic examination enables archaeologists to measure the resulting impact of Teotihuacan's presence in the Maya area. Recent excavations at the site of La Sufricaya in Petén, Guatemala, provide fresh evidence to support Teotihuacan's influence in the lithic record. The site exhibits Teotihuacan influences in architecture, ceramics, lithics, murals, graffiti, and Pachuca obsidian. Projectile points recovered from excavations in Structure 51 at La Sufricaya, of Teotihuacan style but made from Maya stone, offer fresh insight into how Teotihuacan presence was felt by, and the extent that it was adopted by, the people of La Sufricaya.

**Hanratty, Colleen (Maya Research Program) and Thomas Guderjan (University of Texas, Tyler)****[129]**

*A Reexamination of the Distribution of Jade Artifacts at the Maya Site of Blue Creek in Northwestern Belize*  
Excavations at Blue Creek from 1992 to 2000 yielded a large collection of jade artifacts with approximately 900 artifacts being found in a single cache in Structure 4 and a total of nearly 1,500 artifacts recovered from throughout the site. In this paper, we revisit our interpretation of the social context of the Structure 4 cache. In addition, we review the spatial and temporal distribution of jade artifacts throughout the site. Finally, we compare these data to competing models of social control of jade in the Maya world. Was jade a fungible item of commerce or a royally controlled material that was used for rewarding service?

Hanratty, Colleen [17] see Guderjan, Thomas

**Hanscam, Emily (Linnaeus University) and Brian Buchanan (Eastern Washington University)****[106]**

*Walled In: Borderlands, Frontiers, and the Future of Archaeology*

For archaeology to survive in the current political environment and for critical discourse on the past to thrive, archaeologists need to be proactive and advocate for our subject's contemporary relevance. We illustrate the problems and potentials of this advocacy by examining popular perceptions of Roman border zones like Hadrian's Wall, and how these beliefs are related to modern border landscapes like the US/Mexico border. The authors contend that archaeologists have not fully dealt with the powerful imagined continuity of sociopolitical narratives surrounding borderland landscapes. They advocate for a theorisation that recognises both the long-term impact of the materiality of borders and how the uncritical portrayal of the material past, particularly involving politically charged spaces like borders, can contribute to inequality and oppression in the present.

Hanselka, J. Kevin [130] see Koenig, Charles

**Hansen, Daniel (University of Chicago)****[77]**

*Understanding the "Local Scale" in Pictish Landscape Research (Northern Scotland, 300–900 CE)*

The material record of Late Antique and Early Medieval northeastern Britain (ca. 300–900 CE) consists largely of monuments and obtrusive settlements attributed to the people known as the Picts. While features of the landscape from this period, such as the distinctive Pictish symbol stones, have been studied both in isolation and with respect to their general distribution, I argue that a holistic understanding of the Pictish landscape and its relation to social life requires increased attention to what I term the "local scale." The local scale, as I use it, is a provisional heuristic scale meant to encompass immediate landscape surroundings potentially available for processes of place-making and social salience. This paper discusses the theoretical underpinnings and epistemological utility of the local scale for the study of Pictish landscapes. It then evaluates some possible historical and geophysical landscape units, such as historical parish boundaries and drainage basins, that might serve as useful proxies for the implementation of local-scale research. I use spatial statistics in GIS to evaluate the relationship of these proxies to known archaeological material and supplement these analyses with available historical records and qualitative archaeological observation.

**Hansen, David (University of South Carolina), Greg Pratt (Archaeological Expertise LLC), Steven Gilbert (Archaeological Expertise LLC) and Dmitry Voyakin (International Institute for Central Asian Studies)****[102]**

*Preliminary Findings from the Cemetery at the Medieval Ilibalyk Site in Southeast Kazakhstan*

The Ilibalyk (Usharal) site in southeastern Kazakhstan is the location of an ongoing excavation of a medieval

(thirteenth–fourteenth centuries CE) Christian cemetery and settlement. Ilibalyk was located along the trans-continental trade networks often called the Silk Roads. Many trade goods from across Eurasia have been found in association with burials at Ilibalyk. This site is currently the only active excavation of a Christian necropolis in Central Asia. Earlier excavations at contemporary sites in nearby Kyrgyzstan have led to the discovery of *Yersinia pestis* DNA in two medieval Christian cemeteries, providing evidence of the earliest cases of the Black Death known to date. Data from Ilibalyk provides additional context to these sites and could potentially expand the geography of the Black Death into Kazakhstan. Bioarchaeological research is ongoing with the skeletal collection from Ilibalyk ( $n = 69$ ) to expand our understanding of the population health and lifeways of those living at the site and medieval Central Asia more broadly. This poster provides preliminary mortuary and bioarchaeological data from the site and demographic characteristics of the cemetery (images of human remains).

Hansen, Nicolas [41] see Huang, Cindy Hsin-yee

Hansen, Nicolas [66] see Murray, John

**Hanson, Kelsey (University of Arizona)**

**[233]**

*Affectual Ecosystems of Color: Pigments and the Co-creation of Power in the Chaco World*

Color is a deeply pervasive element of cosmology in the Pueblo World of the US Southwest. In these rich, affectual ecosystems of chromatic metaphor, cosmological balance is achieved through nuanced relationships between plants, animals, natural phenomena, and cardinal directions. Relationships are evoked through the appropriate use of certain colors in specific contexts, especially in performances where colorful painted regalia communicates histories and elicits community well-being through chromatic metaphor. The transformation of minerals into paints to meet these needs required highly specialized knowledge, which historically, was a key foundation of Pueblo political power. In this paper, I explore how mineral pigments co-create power in the Chaco World. How do pigments affect sociopolitical realities through their potent symbolism, their unequal geologic availability, their transformations during processing, their potential toxicity? And how are these qualities manipulated or harnessed? I explore answers to these questions by examining distributions of pigments and paint production loci, and the circulation of painted media in the Chaco World, offering new insights into the rise and fall of Chaco political power. Finally, in illustrating this Chacoan case study, I will also consider the inadequacies of Western classificatory systems developed from European artistic traditions in the study of Pueblo chromatism.

**Hanson, Tayla (University of Oregon), Emma Kissel (University of Oregon) and Charlotte Nash (British Museum)**

**[210]**

*Glass Bangles from Saudi Arabia in the University of Oregon's Museum of Natural and Cultural History*

This paper presents research on glass bangle fragments believed to be from the Al Hasa oasis in Saudi Arabia, donated to the University of Oregon's Museum of Natural and Cultural History (MNCH). Glass bangles were manufactured and widely traded across the Middle East and South Asia, but there has not yet been a comprehensive typology of bangle styles and understanding of glass compositions is still in the early stages. Additionally, few bangles have been studied from sites in Saudi Arabia. This has left gaps in our understanding of the trade and use of these objects. Here we begin filling the gap by comprehensively cataloging the diverse bangle assemblage in the MNCH collection using a newly developed typology by Nash and pairing this with compositional analysis using LA-ICP-MS. Based on this work, we date the collection to the thirteenth–sixteenth centuries CE; we have identified evidence for possible local manufacture of bangles, as well as bangles traded from as far away as South Asia. Although this collection is unprovenanced, our work has begun to shed light on the use and exchange of these objects within the region.

**Hard, Robert (University of Texas, San Antonio), Eva Wikberg (University of Texas, San Antonio), Michael Cepek and June Burke**  
[124]

*Classroom to Careers in Anthropology at the University of Texas at San Antonio*

A new course taught in the Department of Anthropology at the University of Texas at San Antonio (UTSA) during Fall 2022 provided early career planning information to lower division undergraduates. Titled "Anthropology Matters," the course had the goal of enhancing the success of undergraduate majors preparing for anthropology related careers. Representing the subdisciplines of archaeology, biological anthropology, and cultural anthropology, we each presented modules on careers in our respective subdisciplines. The course worked closely with the UTSA Career Center in offering multiple career planning tools to students. Final projects consisted of electronic posters allowing students to showcase their personal career plan. We summarize pre-class and post-class assessment data to evaluate the efficacy of this new endeavor.

Hard, Robert [198] see Freeman, Jacob

Hard, Robert [198] see Solis, Kristina

Hardie, Mikala [18] see Gruber, Anya

Harding, Jonathan [50] see Collard, Mark

Hare, Timothy [165] see Antonelli, Caroline

**Hargrave, Eve (NAGPRA Office/OVCRI University of Illinois, Urbana-Champaign), Krystiana Krupa (NAGPRA Office/OVCRI University of Illinois, Urbana-Champaign), Ryan Clasby (NAGPRA Office/OVCRI University of Illinois, Urbana-Champaign) and Aimée Carbaugh (NAGPRA Office/OVCRI University of Illinois, Urbana-Champaign)**  
[124]

*Repatriating Cahokia: Pursuing Tribal Priorities in and around NAGPRA*

The NAGPRA Office at the University of Illinois, Urbana-Champaign is in the process of coordinating a multi-tribe, multi-institution project with the goal of repatriating Ancestors and cultural items from the Cahokia site, near present-day East St. Louis. This presentation summarizes the development and current status of the project, as well as its future goals. In particular, it will detail tribal requests for the identification of additional Cahokia collections, including those which are not known to fall under NAGPRA. Our partner tribes are committed to interpreting Ancestors and objects from Cahokia as comprehensively as possible, and collections from the site are widespread across the country and perhaps globally. Sharing collection information across institutions and with tribes, for collections both within and outside the scope of NAGPRA, is critical for ensuring the collaborating tribes have the opportunity to identify objects of cultural importance from the entire site and therefore ensuring we are repatriating as effectively as possible. The purpose of the presentation is to expand our collaborative efforts on this project by reaching as many collecting institutions as we can.

Harmand, Sonia [21] see Anderson, Jenna

Harmansah, Ömür [63] see Johnson, Peri

**Harper, Ross (AHS) and Katharine Reinhart (AHS)**  
[147]

*Setting the Table at the ca. 1638 Waterman House Site, Plymouth Colony*

The early period of settlement in New England has most often been examined through the available historical

documents and accounts, with little in the way of tangible material culture or features to connect what we read to the lived experiences of the colonists. However, AHS Inc.'s 2013 extensive data recovery of the ca. 1638 Waterman House site in Marshfield, Massachusetts offered the rare opportunity to conduct such analyses. In addition to the identification of the earthfast home's footprint and domestic features, a rich assemblage of seventeenth-century domestic artifacts and food remains were recovered. Through the analysis of this varied data and historical records, we are able to construct intimate details of the Waterman's daily life. As a yeoman family living in one of the earliest satellite communities to be established after the founding of Plymouth Colony, the remnants of their home and former belongings showcase seventeenth-century life in the colonies as they began to shift into what would eventually become the New England "Yankee" identity. This paper will discuss our analysis of the Waterman home with a focus on the recently analyzed macrobotanical assemblage and what it means for interpreting this dynamic phase of New England history.

Harper, Sara [143] see Arakawa, Fumi

Harper, Thomas [22] see Bongers, Jacob

Harrell, Kate [30] see Bassett, Hayden

**Harrelson, David (Grand Ronde Tribe)**  
**[98]**

*Discussant*

Harrington, Jen [182] see Horton, Elizabeth

Harris, Jacob [218] see Freiwald, Carolyn

Harris, Jacob [66] see Murray, John

**Harris, Megan (University of British Columbia)**  
**[41]**

*No Knapping in the Shelter: Lithic Analysis from the Chuchuwayha Rock Shelter, Similkameen Valley, British Columbia*  
The Chuchuwayha Research Project focuses on the past use of the Similkameen Valley in south-central British Columbia. The driving question of this research project is how have the Similkameen people used the landscape of the Similkameen Valley over time. The Chuchuwayha rock shelter provides the best lens to understand the use and occupancy in the Similkameen Valley given its location in relation to other rock shelter sites, length of occupation, and cultural significance to the Upper Similkameen Indian Band. Excavations at the Chuchuwayha rock shelter have provided some insight into the occupation of the site. This poster presents the ongoing lithic analysis from this site focusing on what the lithic assemblage can say about occupational spaces and potential uses at this site.

Harris, Megan [101] see Elvidge, Michael

**Harris, Oliver (University of Leicester)**  
**[242]**

*Discussant*

Harrison, Kristen [77] see Borrego, Raylene  
 Harrison, Kristen [17] see Cortes-Rincon, Marisol  
 Harrison, Kristen [55] see Vizcarra, Hannah  
 Harrison, Kristen [95] see Zetz, Amanda

**Harrison, Ramona (University of Bergen, Norway) and Arni Daniel Juliusson (University of Iceland)**  
**[173]**

*Two Valleys Archaeology in an Environmental Humanities Context*

This talk discusses the challenges of connecting the currently ongoing Two Valleys Project in Iceland to various scales of research on human ecodynamics of the past and global challenges we face in our time. This interdisciplinary project expands on previous research into human-nature interactions within various marine and terrestrial environments of the Eyjafjord region. The Two Valleys Project looks to address long-term coastal and inland resource organization and exchange strategies as part of local and international socioeconomics. Siglunes, a coastal site threatened by coastal erosion, will be of central focus to highlight how long-term archaeological fieldwork is the anchor in this regional node as part of a larger system of Distributed Observing Networks of the Past (DONOP).

**Harrison-Buck, Eleanor (University of New Hampshire)**  
**[83]**

*Discussant*

**Harrison-Buck, Eleanor (University of New Hampshire)**  
**[11]**

*Materializing the Maya Collapse and Shifting Alliances during the Ninth and Tenth Centuries: Circular Shrines and Other “Mexicanized” Traits in Belize and Beyond*

Across the Maya Lowlands, circular shrines have been reported that resemble smaller versions of the Caracol building at Chichen Itza. According to Ringle and colleagues (1998), Chichen Itza was one of many centers in a shrine network extending along the Gulf and Caribbean coasts between AD 700 and 950. Circular shrines are cited as one of a number of “Mexicanized” traits marking a religious cult centered on the feathered serpent deity, which spread aggressively through militarism across a broad area of Mesoamerica. Similarly, Thompson (1970) and others posit the spread of Mexicanized traits via Chontal-speaking Maya warrior-merchants migrating from the Gulf Coast. In recent years, more archaeological data has been found that allows for further cross-examination of these models. Here I present finds of circular architecture, along with other Mexicanized traits from sites in Belize and beyond. The influx of these traits points to greater emphasis on the consolidation of alliances with the Gulf and northern Yucatán but also coincides with widespread site termination marking the collapse of many large Classic Maya city-centers. I suggest this conflict and overthrow was accompanied by the formation of new dynasties in the Maya Lowlands that involved small-scale migration and intermarriage with Mexicanized “foreigners.”

Harrison-Buck, Eleanor [17] see Brouwer Burg, Marieka  
 Harrison-Buck, Eleanor [115] see Tibbits, Tawny

**Harrod, Ryan (Garrett College)**  
**[227]**  
*Chair*

**Harrod, Ryan (Garrett College) and Kathryn Baustian (Skidmore College)**  
**[227]**

*To Fight or Not to Fight: Comparing Evidence of Violence on Human Skeletal Remains at Sites in and around Chaco Canyon and the Mimbres Region*

The intent of this presentation is to compare patterns of violence on human skeletal remains recovered from archaeological sites in the San Juan Basin associated with Chaco Canyon and the Mimbres region in the US Southwest. The Chaco sites date to AD 850–1300, while the Mimbres sites date to AD 650–1300. Bioarchaeological signatures of violence on the remains have been identified and standardized methodologies have been developed by the authors as part of a collaborative effort. The patterns of traumatic injury are compared in each region to assess similarities and differences in the approach to violent interaction during times of stress. At Chaco, 28.6% of those studied had at least one healed cranial injury with evidence of lethal violence, while 10.5% of those studied had healed trauma at Mimbres with no lethal violence. Additionally, 33.0% of females had trauma at Chaco and only 5.0% did at Mimbres, indicating differences in gendered participation in conflict. Harrod suggests that violence in Chaco Canyon was used as a means of social control, while Baustian suggests that socially sanctioned cultural practices helped to prevent or at least reduce violence among the Mimbres people.

Harry, Karen [180] see Terlep, Michael

**Hart, Isaac (University of Utah), Andrea Brunelle Runburg (University of Utah), Jennifer DeGraffenried (US Army Dugway Proving Ground), Daron Duke (Far Western Anthropological Research Group) and D. Craig Young (Far Western Anthropological Research Group)**

[74]

*A Multiproxy Approach to Refining a Sediment Core Chronology with Data from Multiple Sites in the Western Lake Bonneville Basin, USA*

We present a novel approach to developing a unified radiocarbon-based chronology for multiple sediment cores from a location where radiocarbon dating is challenging. We used 36 radiocarbon ages from eight terminal Pleistocene and Holocene sediment cores with correlated stratigraphies. Stratigraphic correlation was accomplished using a combination of high-resolution photography, high-resolution X-ray fluorescence-based elemental composition data, and volcanic tephra identification. Results show that despite problems associated with potential contamination or radiocarbon reservoir effect, a useful age-depth model has been created for the correlated lacustrine sections of these eight sediment cores, providing chronological controls for future paleoenvironmental analyses of the cores.

Hart, Isaac [121] see Bommarito, Savannah

Hart, Isaac [244] see Taylor, William

Harty, Jennifer [209] see de Gregory, J.

**Harvey, David (PaleoWest), Judson Finley (Utah State University), Erick Robinson (Boise State University) and Edward Herrmann (Indiana University)**

[198]

*The Age and Function of Slab-Lined Stone Features Associated with a Fremont Foraging-Farming Landscape in Cub Creek, Dinosaur National Monument, Northeastern Utah*

Utah's Fremont archaeological complex is well-known as a transitional foraging-farming society from AD 300–1300. Individual Fremont systems included a set of bundled agricultural niches with associated foraging ranges. In a recent survey above Cub Creek in Dinosaur National Monument, we discovered many slab-lined stone features in an upland area not well-suited for agriculture. This study presents the results of AMS radiocarbon dating and macrobotanical analyses to determine the age and function of the features. An initial AMS radiocarbon age indicates the features date to the early Fremont period prior to the intensification of maize agriculture and the formation of a settled pithouse community in Cub Creek from AD 840–1080. These open-air slab-lined features appear to have functioned as earth ovens where large volumes of plant

foods could be prepared for immediate consumption or transported to the Cub Creek lowlands. These data complement the well-documented local foraging-farming transition where a mixed foraging-farming economy was a strategy for offsetting the effects of variable precipitation and provide a comparative framework for the function of slab-lined storage features common in the region from the Archaic through Fremont periods.

Harvey, Virginia [70] see LeFebvre, Michelle

Hasaki, Eleni [206] see Serino, Marco

Hasemann, George [125] see Hirth, Kenneth

**Hastorf, Christine (University of California, Berkeley)**  
**[51]**

*Discussant*

**Hastorf, Christine (University of California, Berkeley)**  
**[208]**

*Forensic Culinary Archaeology: Seeking the Longevity of Recipes and Their Flavors from Crete*

While archaeobotanists and zooarchaeologists work very hard to gain information about the presence and frequency of past food ingredients throughout time, it has been almost impossible to get at actual recipes and flavor combinations from archaeological settings. Food archaeologists worked hard while making great strides uncovering the rich archaeological data about ingredients, foods, and cooking strategies. This is increasingly placing food studies more centrally within archaeological inquiry. Here we present another route to learning about past culinary traditions, by getting at the age of some dishes and their flavor combinations, while gaining a sense of the continuity or change of ingredients, dishes, and also flavors from western Crete. By tracking the domestication locale, spread of major ingredients throughout the Mediterranean and their arrival on to Crete, we have been able to roughly date specific recipes that were finally written down in the sixteenth century. From this analysis, we have learned that some recipes are recent, some are from the Bronze Age, and some could have been Neolithic. In this way we can begin to learn about the longevity of some flavorscapes on this important island.

Hastorf, Christine [223] see Chiou, Katherine

Hatcher, Sarah [116] see DiMarco, MacKenzie

**Haug, Jaxson, McKenzie Alford (Southern Methodist University) and Kacy Hollenback (Southern Methodist University)**  
**[124]**

*Skeletons in the Closet: Ethical, Moral, Pedagogical, and Intellectual Issues in Managing Unprovenanced Osteological Legacy Collections*

Legacy collections of human remains at teaching institutions present a unique set of ethical issues. They frequently are the result of decades of unknown sourcing. Even when purchased from medical supply companies, ethical standards over time shift, raising new issues. Hidden away, many institutions know that they hold these collections, yet they may not be aware of the extent, condition, or origins of the individuals. In recent decades, there has been a push to account for, rehumanize, and repatriate legacy collections. But challenges of where to begin can be daunting. Here we detail our process at Southern Methodist University. With the ultimate goal of restoring dignity and identity to these individuals, we outline our protocols for

inventorying, re-cataloguing, and analysis, during which we record age, estimated skeletal sex, population affinity, stature, and potential traumas and pathologies. The creation and utilization of the standard of practice (SOP) outlined here can be applied to human osteological legacy collections at university, museum, and medical institutions. The ethical management of these collections requires that we provide these decedents with the dignity and respect that they were never originally afforded.

Hauser, Lorenz [218] see Moss, Madonna

Hauser, Lorenz [218] see Speller, Camilla

**Hauser, Mark (Northwestern University)**

**[217]**

*Discussant*

**Hauser, Neil (Coal Creek Research Inc.) and Teri Hauser (Coal Creek Research Inc.)**

**[42]**

*Investigation of Contracting Stem Points from the Great Basin and Northern Colorado Plateau*

An investigation of over 300 images of contracting stem points from Nevada, Utah, and western Colorado was carried out using geometric morphometrics (GMM) techniques. The GMM analysis used over 150 landmarks on each of the 2D images. Examination of the principal components and landmarks with respect to geographic occurrence indicate these points changed shape across the geographical region studied. In addition, the dendrogram and clustering results may inform the interaction of the peoples across this region during the Middle Archaic.

Hauser, Teri [42] see Hauser, Neil

**Haverland, Fiona (University of Vermont) and Scott Van Keuren (University of Vermont)**

**[45]**

*Modeling Ceramic Transport with GIS in East-Central Arizona*

Decades of provenance studies in the American Southwest have greatly clarified ceramic exchange networks. However, very little investigation has been done on the actual paths or processes used to move pottery within these networks. What pathways were used to transport pottery? What are the energetics of traveling those pathways? And how were ceramics transported? This poster examines the movement of fourteenth-century White Mountain Red Ware in east-central Arizona. Using ArcGIS Pro, we created a series of least cost paths between producer and consumer areas based on slope, energy expenditure, and external weight. These least cost paths are then used to identify possible corridors of movement between known producer and consumer villages. This study supplements social network analyses by modeling the possible logistics of transporting vessels over long distances and rugged terrain.

Hawdon, John [66] see Mullen, Damon

**Hawkins, Alicia (University of Toronto, Mississauga) and Heather Walder (University of Wisconsin, La Crosse)**

**[6]**

*Investigating Sixteenth- and Seventeenth-Century Wendat Local Interactions Using Glass Bead Chemistry*

Glass trade beads are one of the earliest forms of European material culture to be integrated into Wendat daily lives in the early colonization period in the eastern Great Lakes region. From the late sixteenth century,

Wendat and other Indigenous people traded, modified, and circulated these small durable possessions among their communities, likely both as individual objects and as part of strings and garments. Ontario archaeologists have long used the variation in glass bead types as a tool in chronological organization, but have focused less research on reasons for differences in glass bead assemblages within Wendat territory. To focus on the journey of beads within Wendake, we employ minimally destructive LA-ICP-MS analysis of 350 polychrome and monochrome beads from 13 Wendat sites attributed to four different Nations of the Wendat confederacy. Combined with legacy data obtained with INAA, we examine the dataset for differences in the base glass composition and trace elements of beads from sites of different Nations, ages, and settlement sizes.

**Hawkins, Rebecca (Algonquin Consultants Inc.)**

[156]

*Discussant*

**Hawkins, Rebecca (Algonquin Consultants Inc.), Krystiana Krupa and Jayne-Leigh Thomas**

[136]

*Holding Ground: Reconsidering the Sensitivity of Backdirt in the Context of NAGPRA*

When the remains of Native ancestors, or sacred and ceremonial objects, are screened from backdirt or backfill, what implications does this have for the soil in which they rested? Backdirt is usually considered unimportant after screening, but should, perhaps, archaeologists more carefully consider the ethical implications of the ways that backdirt is processed? Conceptualizing backdirt as potential cultural property raises several concerns, two of which will be discussed in this paper. One is of particular relevance for archaeologists in the field: how should excavation, screening, and tribal consultation practices be developed in order to accommodate the potentially sensitive nature of backdirt? How can issues of cultural sensitivity and consent be addressed effectively? The second concern is especially applicable to museum and NAGPRA practitioners, as well as laboratory archaeologists: how can we appropriately handle soil samples, including those from legacy collections? Might we develop best practices for identifying these and including them in NAGPRA inventories and consultations? We present a case study detailing the importance of approaching backdirt as material that is potentially culturally sensitive and subject to NAGPRA, and suggest best practices based on the perspectives generated by the case study.

Hawkins, Rebecca [111] see Herrmann, Edward

Hawkins, Rebecca [111] see Thomas, Jayne-Leigh

**Hawks, Dustin (Confederated Tribes of Grand Ronde), Briecce Edwards (Confederated Tribes of Grand Ronde), Jeremy Johnson (Confederated tribes of Grand Ronde) and Michael Lewis (Confederated Tribes of Grand Ronde)**

[69]

*Technology Compilation in View*

Technologies have advanced over the past couple of decades to the point of making it is possible, and economical, to produce high quality 3D-models of archaeological objects and features, even in remote field locations, using photogrammetry and 3D scanning apps. The Historic Preservation Office of the Confederated Tribes of Grand Ronde has utilized such technology to fulfill our cultural resource management (CRM) obligations. This poster illustrates recent field applications of 3D imaging to historic architectural and archaeological site recording applicable to both urban and rural settings. The results provide an unprecedented view of the changes through various temporal eras of these settings. Considerations of applicability and the advantages and the limitations for CRM workflows are discussed.

Haws, Jonathan [121] see Benedetti, Michael

Haws, Jonathan [212] see Bicho, Nuno

Haws, Jonathan [47] see Carvalho, Milena

**Hayashida, Frances (University of New Mexico)**

[12]

*Discussant***Haydosyan, Hayk (Institute of Archaeology and Ethnography, Republic of Armenia), Artur Petrosyan (Institute of Archaeology and Ethnography, NAS RA), Dimitri Arakelyan (Institute of Geological Sciences, NAS RA), Phil Glauberman (Catalan Institute of Human Paleoeology and Social Evolution) and Boris Gasparyan (Institute of Archaeology and Ethnography, Armenia)**

[56]

*The Paleolithic Archaeology of Shirak Province (Armenia)*

Within Shirak Province in the Republic of Armenia, the open-air site complex at Aghvorik is currently the most prominent site. The Paleolithic sites of Shirak are geomorphologically associated with the Ashotsk Plateau in the north, the Shirak Depression and northwestern slopes of Mt. Aragats in the south, and the Akhuryan River gorge in the west. These areas contain several sources of high-quality lithic raw materials, including dacite, obsidian, and flint. The geomorphic and topographic locations of Paleolithic sites relate to phases of Plio-Pleistocene volcanism, glaciations in high-elevation uplands, and the lacustrine and alluvial dynamics that formed the paleorelief and paleoenvironment. Lithic artifact assemblages generally present techno-typological characteristics consistent with early and late phases of the Acheulian, as observed at Lower Paleolithic sites in the Armenian Highlands and southern Caucasus. Middle Paleolithic assemblages from the region are rarer but better preserved. Shirak is also rich in paleontological, or zooarchaeological, sites that have yielded a range of Pleistocene macro- and micro-faunal remains. While the Paleolithic archaeological, biostratigraphic, and geological records of Shirak have not yet been subject to systematic documentation and synthesis, the area holds great potential to enlarge and complement the database of Pleistocene human occupation in the broader region.

Haydosyan, Hayk [56] see Gill, Jayson

Hayes, Liam [216] see Sturm, Camilla

Haynes, Gary [170] see Wriston, Teresa

**Haynes, Gregory, Megan Stueve (Desert Research Institute), David Page (Desert Research Institute) and Lisa Cipolla (USAG Fort Hunter Liggett)**

[28]

*Results of the Fort Hunter Liggett Rock Art Investigation Project in Monterey County, California*

Fort Hunter Liggett (FHL), in the central coastal region of California, contains a prodigious rock art record composed primarily of hundreds of red, black, and white pictographs. Most people familiar with this rock art know of the National Register-listed La Cueva Pintada, a large cave with several hundred overlapping elements, but there are also other archaeological sites on the installation with pictographs. Importantly, rock art at FHL is concentrated in two locations: (1) away from habitations on an isolated mountain top and, (2) directly associated with habitations on a valley floor. This poster presents the results of recent research by USAG Fort Hunter Liggett, in partnership with Desert Research Institute, on this unique pictographic assemblage. First, we display data on the number of elements, their colors, and combination of motifs for each site and show there are important differences between the two concentrations. Second, using pXRF analyses, we discuss the geochemical composition of various pigments used in element creation and implications regarding pigment use and procurement.

**Haynes, Hannah (University of Central Florida) and J. Marla Toyne (University of Central Florida)****[73]***Exploring the Mortuary Landscape at Kuelap, Peru, Using Geographic Information Systems*

Mortuary placement is one form of ritual action that communities undertake to remember the dead. The location of the dead is important for considering social memory, a source of collective knowledge and experiences that shapes social group identity. This allows anthropologists to ask questions about how human social relationships transform living landscapes. This research utilized a novel approach that combines geographic information systems (GIS) and stable isotope data to explore within-site mortuary variation within the Chachapoya site, Kuelap, in the northern Peruvian Andes (AD 800–1535). This study examined the spatial distribution of 440 individuals buried within the site through the variables of mortuary types, age-at-death, osteological sex, and carbon and nitrogen stable isotope compositions. The results indicated age-at-death and osteological sex did not appear to have strong relationships with mortuary placement, suggesting group identity was emphasized over age or sex identities. Additionally, a relationship between spatial variation and carbon stable isotope data suggested possible chronological change in mortuary practices. By considering the spatial patterns of these data, this study explored the mortuary landscape at Kuelap and provided a deeper understanding of Chachapoya mortuary practices. This research successfully integrated different methodological approaches to answer anthropological questions regarding mortuary placement.

Hays-Gilpin, Kelley [248] see Bellorado, Benjamin

Hazard, Rebecca [8] see Dudgeon, John

Hazelwood, Lacy [45] see McDonald, Holli

**He, Yahui (Stanford University)****[222]***A Symbiotic Relationship between People, Plants, and Microbes: A Case Study on the Fermented Beverages from the Chahekou Site in North China during the Middle Neolithic Period*

The making of fermented beverages is a complex process through the interaction among people, plants, and microorganisms, among other abiotic factors. In this process, microbes, as the primary catalyst, get all the agents gradually entangled in the fermentation process. During the middle Neolithic, there was an evident population movement from the Central Plains to the north region of China in today's Inner Mongolia. Previous archaeological studies have revealed the similarities between the ceramic utensils in north China and their counterparts in the Central Plains. Nevertheless, our recent microfossil analysis has also examined a northward spread of fermented beverage technology along with plant food exploitation, which helps form a symbiotic relationship between people, plants, and microbes in food and drink practices.

**Headrick, Annabeth (University of Denver)****[133]***Chair***Headrick, Annabeth (University of Denver)****[133]***Now You See Her, Now You Don't: Female Gender and Its Contexts at Teotihuacan*

This paper explores the confounding issue of female-gendered images at Teotihuacan. Figures clad in female-gendered clothing appear within Teotihuacan's most prominent and luxurious arts. Some of the largest sculptures and most precious stone figures are female, and these sculptural images were recovered from highly symbolic, civic spaces. Similarly, females appear frequently among the humbler figurines of the city, suggesting that women played important and prominent roles in Teotihuacan's domestic and public realms.

While females regularly appear within Teotihuacan's three-dimensional art, curiously, their presence within the two-dimensional arts of murals and ceramics are decidedly less frequent. By examining the presence of women in various art media and contexts at Teotihuacan, a case will be made for both their public, and potentially political, prominence but also their possible suppression in some forms of civic activities. Through an examination of sculpture, figurines, murals, and stuccoed ceramics, the tensions between women holding important civic roles versus state efforts to codify proper gender roles may be better comprehended. In exploring these various art media, attention will be given not only to what is depicted, but also what is not, thereby resulting in a better understanding of Teotihuacan's socially constructed ideals of gender.

Heale, Laura [25] see White, Chantel

Heasley, Kristen [37] see Hulse, Eva

**Heath-Stout, Laura (Brandeis University)**

**[131]**

*Archaeology Moms: Mobility, Parenting, and Privilege in Archaeology*

One of the great parts of being an archaeologist is that it is an excuse to travel: for jobs, research, and conferences. Yet some of us are more free to travel than others. In this paper, I will focus on the experiences of parents—mothers in particular—to explore how the expectations of mobility in archaeology poses problems for some members of our professional communities. The paper will draw on approximately 100 qualitative in-depth interviews conducted with a diverse sample of US-based academic archaeologists between 2016 and 2021. I argue that archaeology careers are structured on the assumption that our primary commitment is to our work, and that those of us who have conflicting commitments (such as to our children) often use money and spousal or familial support to navigate archaeology careers. Because these resources are not available to all archaeologists, parenting is most accessible to the most privileged archaeologists. We must restructure archaeology to make it possible for practitioners of all identities to both succeed in their careers and form families however they prefer.

**Hechler, Ryan (Tulane University) and Will Pratt (University of Texas, Austin)**

**[36]**

*Running Down That Hill: Inka Imperial Problems in the Tropical Montane Cloud Forests of Ecuador*

Over multiple Inka emperors' reigns, Tawantinsuyu (the Inka Empire) had notoriously difficult experiences trying to secure their foothold in the Amazon. When marching north into the highlands of modern Ecuador, the Inkas thought it best to expand westward with their colonial agenda prioritizing access to the Pacific Coast before the northwestern Amazon. However, this region was distinctly tropical in comparison to the desert coasts of modern Peru and Chile. This tropical montane cloud forest was challenging to navigate and the diverse societies that resided there proved to be resilient and not necessarily culturally intelligible to the socially hierarchical organization of Tawantinsuyu. What started off in as imperial aggression in many cases quickly shifted toward imperial courting of societies that could not be subdued even well into Spanish colonialism. Through several case studies of Inka sites throughout this region from southern to northern Ecuador, we will explore the varied and often problematic situations the Inkas encountered while trying to court this unique region.

Hechler, Ryan [54] see Pratt, Will

**Heckenberger, Michael (University of Florida)**

**[110]**

*Discussant*

**Heckman, Jasmine (USACE, MCX CMAC)****[231]***Discussant***Hector Rolando, Aj Xol Ch'ok (Academia de las Lenguas Mayas de Guatemala) and Mauricio Díaz García (Graduate Center, CUNY)****[52]***Dueñas de la memoria, guardianas de la historia: Mujeres Mayas, ritualidad y arqueología en el altiplano del territorio guatemalteco*

En el contexto de pueblos invadidos y luego brutalmente colonizados en los territorios que conforman la actual República de Guatemala, las mujeres mayas juegan un papel fundamental en la preservación, transmisión y radicalismo de la cultura. Las mujeres mayas son las constructoras y guardianas del pensamiento, idiomas, valores, filosofías y normas de vida de las comunidades. En una palabra, son las dueñas de la cultura. Dentro de la ritualidad contemporánea, las mujeres, tanto jóvenes como mayores, ancianas o antepasadas han sido y son las referentes que organizan, orientan y mantienen la cultura a través de la oralidad y las prácticas cotidianas. Esta presentación busca visibilizar el papel de la mujer maya dentro de la ritualidad, además de ser el origen y quienes preservaron el Cholq'ij. Se examinarán evidencias de prácticas rituales contemporáneas y cómo estas hacen uso de objetos antiguos dentro de los rituales. La práctica arqueológica “académica” entra en conflicto y muchas veces despoja de sus significados a estos objetos antiguos que más allá de pertenecer a un museo hispanocéntrico, pertenecen a las comunidades descendientes y guardianas de los pueblos antiguos.

**Hedges-Knyrim, Geoffrey****[43]***The Agricultural Economy of the Iron Age Southern Levant: Contrasting Preliminary Archaeobotanical Data from Tel Abel Beth Maacah and Khirbat al-Balu'a*

The agricultural economy of the Iron Age Southern Levant remains underexplored archaeobotanically, especially at an integrated, regional level. The data that is available suffers from few abundance datasets and is often difficult to access or unpublished. Out of 26 Iron Age sites with available data, only 6 have abundance values and other quantitative measures. This paper will give a regional analysis of the agricultural economy during the Southern Levantine Iron Age (1200–586 BCE) by contrasting preliminary data from two sites: Tel Abel Beth Maacah (ABM) and Khirbat al-Balu'a (Balu'a). The preliminary samples presented come from domestic contexts, specifically surfaces, ovens, and pits. Agricultural practices are inferred from ubiquity, proportion, and CA at the intra- and intersite levels. These practices will then be related to environmental (e.g., annual precipitation, location, and elevation), political (centralized vs. decentralized), and temporal (e.g., Iron I vs. Iron II) factors. Preliminary results show a difference between the sites from annual precipitation, which is consistent with prior research in Southwest Asia (Smith and Munro 2009; Vermeersch et al. 2021). The results from these sites will then be integrated with the available data to present a regional archaeobotanical picture of the Iron Age Southern Levantine agricultural economy.

Hegmon, Michelle [90] see Adler, Michael

**Heilen, Michael (Statistical Research Inc.) and Shelby Manney (Arizona Army National Guard)****[124]***Refining Archaeological Data Collection and Management*

Most archaeological investigations in the United States and other countries must comply with preservation laws, if on government property or supported by government funding. Academic and cultural resource management (CRM) studies have explored various social, temporal, and environmental contexts and produce an ever-increasing volume of archaeological data. More and more data are born digital, and many legacy data

are digitized. There is a building effort to synthesize and integrate data at a massive scale and create new data standards and management systems. Taxpayer dollars often fund archaeological studies that are intended, in spirit, to promote historic preservation and provide public benefits. However, the resulting data are difficult to access and inter-operationalize and rarely collected and managed with their long-term security, accessibility, and ethical reuse in mind. Momentum is building toward challenging oppositional perspectives to data access: open data and open science versus indigenous data sovereignty and governance. The field of archaeology 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 poster focuses on challenges and opportunities in archaeological data collection and management in academic and CRM contexts.

Hein, Anke [121] see Jaffe, Yitzchak

Hein, Anke [216] see Womack, Andrew

Heintz, Jesse [183] see Prince, Paul

Heisinger, Bryan [112] see Rhoads, Tyler

### **Helmer, Elliot (Washington State University)**

**[23]**

*Shellscape and Kinscape: A Social Network Analysis of the Southern Northwest Coast*

Social network analyses in archaeology have been successfully used to examine the connections between diverse social actors in the past. These studies have largely focused on the relationships between humans and other humans, typically using cultural materials as proxies for people. The principles of relationality in Indigenous cultures, however, teach us that, in most cases, nonhuman actors are equal participants in the creation, structuring, and ongoing negotiation of social networks. This paper presents the results of a social network analysis in the traditional homelands of the Miluk and Hanis Coos-speaking peoples of the southern Northwest Coast. Drawing from local oral histories and contemporary discussions of the relationship between humans and their nonhuman kin, this analysis incorporates nonhuman persons as actors in the social network. Thus, rather than using cultural materials to characterize the social networks just between the human people at different sites, this study examines the social networks between humans and different animal species and their associated habitats. I will then further investigate patterning in these relationships to identify variations in how people at different sites related to their landscape and their nonhuman kin.

Helmke, Christophe [28] see Watkins, Tia

### **Helzer, Margaret**

**[211]**

*Teaching Archaeology in the Age of Disinformation*

After three decades of teaching archaeology courses at the college level, students still ask me about my views on Sasquatch, aliens, and intelligent design. In fact, these questions come up more frequently now than they ever had in the past. Those of us who teach archaeology are faced with a paradox: while current advancements in science technology lead to more precise field and laboratory techniques, mainstream society is bombarded by the internet and the entertainment industry with falsehoods, fake news, and spectacular bogus claims about the nature of the human past designed as click-bait. This presentation will explore strategies for combatting pseudoscience in the age of disinformation and to help our students recognize the importance of the scientific method.

**Hemphill, Charles (Archaeology Southwest)****[199]***Analysis of Shell Trade Patterns at Salado Sites in the Southwest*

The purpose of this poster is to examine the shell assemblages found at the Dinwiddie, Gila River Farm, and 3-Up sites that were excavated by previous Archaeology Southwest field schools. The poster will focus on shell trade and exchange to determine if there are differences in shell trade between the three sites, temporal differences in the types of shell that were being traded, as well as where utilized shell was coming from. The three sites in question are associated with the Salado. Salado is a cultural movement/ideology that occurred in the 1300s, and involved Kayenta peoples migrating south into Mogollon and Hohokam regions of the Southwest and coalescing with the local inhabitants of those areas. This coalescing of people and ideas can be seen in many aspects of daily life, and this poster will assess whether patterns of shell trade are part of this broader pattern.

**Henderson, A. Gwynn (Kentucky Archaeological Survey), David Pollack (Kentucky Archaeological Survey) and Benjamin Barnes (Shawnee Tribe)****[19]***“What Was Our Ancestors’ Pottery Like?” Exploring Ceramic Heritage with the Shawnee Tribe*

A hallmark of Tom Dillehay’s career is his engagement with local and descendant communities. This is exemplified by his tireless work for the Mapuche, the establishment of anthropology departments throughout South America, and the instrumental role he played in creating the Kentucky Archaeological Survey. We do not recall him ever preaching about community engagement—he simply did it. “Giving back to the community” is one of our missions at the Kentucky Archaeological Survey. At the request of the Shawnee Tribe, we have joined an interdisciplinary team of archaeologists, ethnohistorians, linguists, ceramic artists, and Tribal citizens to help them reconnect to their Fort Ancient ancestors and rediscover ancient foodways by understanding Fort Ancient pottery. It is the Tribe’s hope that a new generation of Shawnee artists will revive its precontact ceramic traditions. In the spirit of collaboration modeled by Dillehay, we report on preliminary results of our research with the Shawnee Tribe—our own “giving back” to a Native community that considers Kentucky its ancestral home. This research targets shell tempered Madisonville Tradition ceramics recovered from locations where historic period documents indicate the Shawnee may have migrated to in the late 1600s/early 1700s, especially near Savannah, Georgia.

Henderson, A. Gwynn [19] see Pollack, David

Henderson, Kaylee [112] see Roberts, Victoria

**Hendrickson, Mitch (University of Illinois, Chicago)****[109]***The Power of Pyrotechnologies: Ceramic, Iron, and Bronze in the Rise of the Angkorian Khmer Empire, Cambodia (Ninth to Fourteenth Centuries CE)*

Crafting with fire is a central feature in the expansion of premodern states. In mainland Southeast Asia, the Angkorian Khmer (ninth to fourteenth centuries CE) possessed a unique mastery of three types of pyrotechnological production: stoneware ceramics, copper-base alloys, and iron. While the products of each craft (pots, statues, tools) were used and dispersed in markedly different contexts (capital/regional; temples/households), they each played a critical role creating the Angkorian identity. This paper examines how these pyrotechnologies were controlled by the Khmer state and, more importantly, highlights the power of mobile material culture as a driving force behind its expansions across Cambodia, Thailand, and southern Laos.

**Henebry-DeLeon, Lourdes (Central Washington University)****[32]***Discussant*

Henke, Harold [167] see Simon, Rebecca

**Henkin, Joshua (Field Museum of Natural History) and Javier Echeverría (Universidad de Santiago de Chile)**

[126]

*A Molecular Networking Approach to Identifying Metabolites in GC-MS Spectra from the Gastrointestinal Contents of Mummies of Tarapacá-40 (Northern Chile, Formative Period, 1000 BCE–600 CE)*

Eight samples from the gastrointestinal tracts of mummies exhumed at the Formative cemetery site of Tarapacá-40 (Northern Chile, Formative period, 1000 BCE–600 CE) were solvent extracted, silylated, methylated, and injected into a gas chromatograph-mass spectrometer (GC-MS) to identify biologically relevant metabolites. The resultant .raw files of these obtained GC-MS spectra were converted to .mzML files and then ran through the Data Processing—Deconvolution and Library Search/Networking tools available through the online open-access resource Global Natural Products Social Molecular Networking (GNPS). A chemical similarity network of mummy metabolites and their derivatives was visualized and annotated in the open-source bioinformatics software Cytoscape using this automated data processing and networking output from GNPS. Clusters of steroids and fatty acids/acylglycerols as well as their derivatives (e.g., methylated) and/or degradation products (e.g., dicarboxylic acids and their methyl esters) were observed. This data was reprocessed multiple times by varying the minimum pairs cosine score parameter to examine the effect on clustering as well as node annotation. Ultimately, the networks derived from this data are now in a form where they can be processed further through Cytoscape, Python, and/or other tools in order to identify potential biomarkers of health/disease, diet, and medicinal plant use.

Henry, Auréade [15] see White, John

**Henry, Edward (Colorado State University)**

[127]

*Chair*

**Henry, Edward (Colorado State University), Jennifer Kielhofer (Desert Research Institute) and Lia Kitteringham (Colorado State University)**

[127]

*Mixing and Moving Earth: The Geoarchaeology of a Newly Rediscovered Middle Woodland Earthen Enclosure in Central Kentucky*

Earthwalker Circle is a small Middle Woodland era (ca. 200 BCE–CE 500) ceremonial ditch and embankment enclosure located on privately-owned land at the border of Kentucky's Bluegrass and Knobs physiographic regions. This enclosure was recently rediscovered as part of a regional assessment of lidar-derived visualizations and drought-based aerial photography. Excavations at the site focused on assessing how and when the ditch refilled, and how the causeway entrance to the site was arranged. Using a combination of macro and micro-based geoarchaeological methods we assess the nature of ditch refilling, as well as use of the site after this enclosure was no longer visible on the landscape. Our work shows it is unlikely that the ditch refilled naturally after a period of abandonment and was most likely refilled through intentional human actions. Moreover, our results indicate that the site was potentially marked by later Fort Ancient (ca. CE 1000–1500) villagers using arrangements of wooden posts. The culmination of our research at the Earthwalker enclosure emphasizes a landscape in motion, whereby the built environment changed as local histories tied to much broader social movements unfolded.

**Henss, Alyssa (College of Wooster)**

[30]

*The Weaknesses of a Colonial Mindset: A Study of Indigenous Spirituality during the Maya Caste War*

A major feature of colonization of the Americas was the weaponization of the Christian faith. In colonial Latin America it was distorted and weaponized to push a political agenda of forced conversion upon Indigenous

peoples. In the instance of the Maya Caste War, however, this idea was flipped on its head by Indigenous peoples who used their spirituality to defend their own communities. At the center of this movement was the cult of the Talking Cross, a fusion of Christianity and traditional Maya beliefs and practices that revitalized Indigenous Maya spirituality and brought numerous people together. My project involves analysis of the archaeological roots of the spirituality surrounding the Talking Cross from the early 1950s to 1901. Utilizing archaeological and secondary textual and ethnographic sources, I argue that the utilization of Indigenous religion during the Maya Caste War was more effective in unifying the Indigenous people of Yucatán than their Western opponents' forced weaponization of Christian spirituality and reshaped understandings of cultural heritage. My goal is to highlight Indigenous perspectives on the Caste War.

Hepburn, Heidi [112] see Biver, Matthew

**Hepp, Guy (California State University, San Bernardino) and Marc Levine (University of Oklahoma)**

[91]

*Toward a Typology of Late Postclassic Period Figurines from Tututepec, Oaxaca, Mexico*

In this paper, we present a preliminary typology, description, and discussion of ceramic figurines from Late Postclassic period (CE 1100–1522) Tututepec, a regional capital located on the coast of Oaxaca. The figurine sample is primarily drawn from household excavations carried out in 2005 and 2022 but also includes material curated in the local community museum (Museo Yucu Saa). These objects permit the preliminary identification of local and regional patterns in small-scale ceramic representation during the last few centuries before the Spanish incursion. We propose a few general figurine types, including tubular and flattened anthropomorphs, some of which were likely also pendants or musical instruments. We also discuss production techniques, including the use of molds, hand modeling, and polychrome paint. We then discuss the possible uses and meaning of these objects in cultural practices based on their archaeological context, as well as ethnohistoric records. We conclude by comparing figurines from Tututepec with contemporaneous artifacts from elsewhere in Mesoamerica, including Cerro de las Mesas and Isla de Sacrificios, Veracruz. We close by highlighting pending research questions and paths toward the future study of the Tututepec materials.

Hermenegildo, Tiago [20] see Watling, Jennifer

**Hernandez, Catherine (CUNY)**

[237]

*Duendes, Fantomas y Encantamientos: How Dos Mangas Connects to Archaeological Heritage through Folktales*

The lands of the Comuna Dos Mangas are replete with archaeological material, including the Buen Suceso Archaeological site. Over the Comuna's history, generations of its residents have encountered thousands of artifacts from the Valdivia, Machalilla, Chorrera, Guangala, and Manteño peoples. Despite not identifying as direct descendants of any of the aforementioned Indigenous peoples, the comuneros have developed a connection with these cultures beyond the scope of biological ancestry. While much has been written on the community stewardship of archaeological sites and the phenomenon of contemporary art from Ecuadorian artists featuring references to ancient cultures, this paper focuses on connections built through folklore. Members of the Comuna Dos Mangas have built a corpus of stories of encounters with archaeological materials and apparitions of Indigenous peoples. In conducting oral history work with community members, many revealed that they had relatives who were "enchanted" by the forest and arrived home carrying artifacts, had heard sounds they associated with Indigenous peoples, and many other instances of supernatural experiences. This paper discusses these stories in the context of a broader exploration of how non-descendant populations in Ecuador build distinct cultural relationships with ancient Indigenous peoples.

**Hernandez, Christopher (Loyola University Chicago)****[211]***Integrating 360 VR, 3D Printing, and the Undergraduate Archaeological Classroom*

Over the course of the twenty-first century, archaeologists have increasingly embraced digital technologies for research, data curation, and public engagement. Yet, like the practice of pedagogy as a whole, greater emphasis and systematic investigation is required on the role of new technologies in the archaeological classroom.

Beyond 'wow factor' and earning social capital in the neoliberal university, does the integration of digital technology in the archaeological classroom improve learning outcomes? Do students feel a greater sense of connection with course content and engage in deeper critical reflection? In this paper I examine the impact of integrating VR goggles and 3D printing in two undergraduate archaeology courses that I taught in the fall of 2022. I assess the impact of both technologies via anonymous student feedback collected as part of mid-semester and end-of-semester evaluations. In addition to discussing results, I examine how to integrate both technologies into a relational pedagogy (i.e., learning with) that treats students as active learners and teachers.

Hernández, Gloria [58] see López, Raúl

Hernández, Reina [191] see Díaz García, Mauricio

Hernandez Bellido, Daira [9] see Ortiz Brito, Alberto

**Hernández Garavito, Carla (University of California, Santa Cruz)****[19]***Discussant***[19]***Chair***Hernández Garavito, Carla (University of California, Santa Cruz) and Peter Kaulicke (Pontificia Universidad Católica del Perú)****[61]***Some Remarks on Early Social Complexity in the Central Andes*

The well-known protohistoric Inca Empire of the late fifteenth century had achieved a remarkable degree of social complexity preceded by a similar expansive state some 500 years earlier. The lack of pre-European writing systems, however, obscures access to these earlier social formations. Thus, the social nature of pre-sixth-century polities has been much debated. In the search for the origins of Andean states, Chavín in the northern highlands is often seen as the earliest manifestation of social complexity or civilization. But, more recently, a large coastal site with presumably similar characteristics flourished much earlier. Culture historical approaches, however, cannot explain the emergence of these phenomena. The step toward social complexity in the Old World has been known as a long process of domestication and related sedentism beginning in the Late Pleistocene and leading to the Neolithic period. It has been assumed that the Central Andes is an exception to that rule, but Dillehay's long-standing research in northern Peru demands a profound revision backed by solid datasets, which require insertion into a wider picture of cultural and social diversity. This presentation aims at some approaches in this direction.

Hernández Garavito, Carla [19] see Szremski, Kasia

**Hernández Sariñana, Daniela (Boston University), Luis Barba Pingarrón (Universidad Nacional Autónoma de México) and Agustín Ortiz Butrón (Universidad Nacional Autónoma de México)****[100]***Chemical Residue Analysis, Foodways, 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 Tlajinga includes surface collection associated with the Teotihuacan Mapping Project and the excavation of one apartment compound, during the 1970s. Recent investigations carried out by the Proyecto Arqueológico Tlajinga Teotihuacan (PATT) have yielded new data concerning ceramic function and chronology to assess the domestic lifeways in the district. Two compounds (17:S3E1 and 18:S3E1) and two platforms (2:S4W1 and 4:S4W1) that formed part of a barrio center were excavated by the project in three seasons beginning in 2013. A dataset made of 400 samples from complete and semi-complete vessels, as well as selected sherds from primary contexts were analyzed for traces of carbonates, phosphates, proteins, fatty acids, carbohydrates, and pH levels to investigate ceramic function in relation to cooking practices. The chemical residue analysis done in ceramics from Tlajinga along with the established typology at this site provides social insights into different aspects of the quotidian life. It generates diverse lines of evidence that aid our assessment of ceramic consumption at a household level, with implications for understanding its distribution over the centuries of Teotihuacan's occupation.

Hernández Sariñana, Daniela [26] see Carballo, David

Herndon, Kelsey [125] see Griffin, Robert

Herr, Sarah [60] see Mills, Barbara

**Herrera-Parra, Esteban (McMaster University), Melanie Pugliese and Shanti Morell-Hart [140]**

*Traditional Dishes and Culinary Improvisations: Elite Gastronomy in the Maya Area*  
[WITHDRAWN]

**Herrero-Backe, Karen (University of Miami) [157]**

*Discussant*

Herridge, Jamie [232] see Greenwald, Alexandra

**Herrmann, Edward (Indiana University Museum of Archaeology and Anthropology), Rebecca Hawkins (Algonquin Consultants), Christina Friberg (Indiana University Museum of Archaeology and Anthropology) and Jayne-Leigh Thomas (Indiana University NAGPRA Office) [111]**

*Evidence for Ridge and Furrow Agriculture at Angel Mounds in Southern Indiana*

Evidence of agriculture during the Mississippian period in the Midwest derives largely from the identification and analysis of cultivar macrobotanicals from refuse contexts. However, research that investigates how and where crops were grown on Midwestern sites is scant. As a result, few sites have been identified that document farming fields, garden beds, or family plots where cultigens were grown. In this paper, we document remnants of a probable ridge and furrow agricultural system used at Angel Mounds (12Vg1) in present-day southern Indiana. Angel Mounds was a large regional Mississippian (AD 1100–1450) center in a network of sites in the lower Ohio Valley region. Although the site has been examined carefully and archaeobotanical analysis has identified a number of cultigens from various contexts, the location, type, and age of agricultural fields or garden plots have not been previously investigated. Excavations by Indiana University and Algonquin Associates in 2020 recovered the first potential evidence of farming practices in the region, suggesting that farmers grew maize, beans, gourds, and other crops outside of the palisaded, civic-ceremonial portions of the site. The broader implication of our work is that these features are easy to overlook using traditional geophysical and excavation techniques.

Herrmann, Edward [198] see Harvey, David

Herrmann, Jason [211] see Moore, Katherine

Herrmann, Nicholas [45] see Warner, Monica

Herron, Molly [29] see Mackie, Madeline

Herrera, Katherine [61] see Santoro, Calogero

**Herve, Gwenael (Laboratoire des Sciences du Climat et de l'Environnement, CEA), Caroline Robion-Brunner (Centre Français des Etudes Ethiopiennes), Giorgia Ricci (Laboratoire des Sciences du Climat et de l'Environnement), Emmanuelle Delque-Kolic (LMC14, CEA, France) and Didier N'Dah (Université d'Abomey-Calavi)**

**[166]**

*Estimating the Temporality of Iron Smelting Sites in Africa by Coupling Radiocarbon and Archaeomagnetism*

The life of African iron smelting sites (duration and production rate) is poorly known because of the low number of dates per site and the dependence on radiocarbon. On two fields in Togo (Bandjeli district) and Benin (Aplahoué district), this methodological communication shows that coupling archaeomagnetism and radiocarbon helps to estimate the temporalities of metallurgy. In Togo, the study focused on three sites dated by <sup>14</sup>C in the plateau of the last four centuries. To address this imprecision, 18 furnaces were sampled to determine the archaeodirection of the geomagnetic field. Archaeomagnetic dating results could be obtained for 14 structures with a 40–100-year precision. They highlight an activity phase from at least 1650 up to the mid-twentieth century and clarify the chronological relationships between two smelting techniques. In Benin, the two studied sites, excavated since 2020, are mainly constituted by slag heaps. For radiocarbon dating and study of the archaeointensity of the geomagnetic field, respectively, dozens of charcoals and tuyeres or fragments of furnace walls were sampled in different stratigraphic layers. Radiocarbon dates reveal a main activity phase in 1280–1400 CE, while archaeomagnetic results suggest a duration more overall this interval than over a few decades.

Hicks, Megan [14] see Matthews, Christopher

**Higgins, Howard (TRC Environmental Corp.)**

**[136]**

*Discussant*

**Higgins, Howard (TRC Environmental Corp.), Brenda Ireland (Independent Consultant) and Sandra Marian (Director of History and Culture [emeritus] Tahltan)**

**[136]**

*A View from the Bridge: The Role of Anthropological Consultation in the Twenty-First Century*

Many Indigenous groups that underwent the deleterious effects of colonialism and forced acculturation are now in the process of repatriating their traditional knowledge and culture and reclaiming their unique identities, social structures, and governance. In Canada, this process of self-determination is within the context of the United Nations Declaration on the Rights of Indigenous Peoples, which was officially adopted in May 2016, but more generally is within the context of Canada's Truth and Reconciliation Commission's 94 Calls to Action, which were presented in December 2015. This paper concerns such action by the Tahltan, a First Nation whose people live in northwestern British Columbia, Canada. Prior to COVID-19, as a step toward reclaiming Tahltan knowledge, the Tahltan reviewed the historical record to identify what outsiders observed about Tahltan culture, values, social structure, and practices. This effort was directed by Sandra

Marian, the then Director of Culture and Heritage for the Tahltan Government. The paper presents the goals and methodology of this work, identifies the problems found during its promulgation, and concludes with recommendations for such consultation in the future.

**High, John (Dartmouth College) and Jesse Casana (Dartmouth College)**

[69]

*Importance of U-2 Aerial Imagery of Iron Age Cities in the Middle East*

With this research, I hope to digitally reproduce the high-resolution U-2 photographs by specially processing my photographs of the imagery using photogrammetric methods, such as Agisoft Metashape to produce 3D surface models. With these models, I will deduce what implications the structures and features visible in the imagery and models have in association with political regimes (Redford and Ergin, 2013) and economies of the Early Iron Ages in the ancient Near East, concluding whether the development of these cities was planned or unplanned (Novak, 2004) based on the new data gathered from U-2 imagery.

**Hill, Brittany (Far Western Anthropological Research Group)**

[175]

*Chair*

**Hill, Brittany (Far Western Anthropological Research Group), Laurel Engbring (Far Western Anthropological Research Group), David Grant (D&D Osteological Services, San Jose, CA), Monica Arellano (Muwekma Ohlone Tribe of San Francisco Bay Area) and Alan Leventhal (Muwekma Ohlone Tribe of San Francisco Bay Area)**

[175]

*Bioarchaeology of Care in Three San Francisco Bay Area Muwekma Ohlone Ancestral Sites*

This presentation applies Tilley and Cameron's 2014 Index of Care to the mortuary population of three ancestral Muwekma Ohlone sites that were excavated in the San Francisco Bay Area between 2016 and 2022 (CA-ALA-565/H, CA-ALA-677/H, and CA-ALA-704/H). These sites include the remains of 147 individuals dating between approximately 2200–110 cal BP. This analysis begins by describing the interred individuals and providing differential diagnoses of pathological conditions that were observed during osteological analysis of remains from these three sites. Over 10% of the 147 individuals examined showed evidence of congenital or acquired pathological conditions which likely impacted their ability to care for themselves, with the incidence of severe pathology increasing to over 20% during the protohistoric period. Notable pathologies present include tuberculosis, hydrocephalus, acute septic arthritis, nutritional deficiencies, and physical injuries which lead to infection. With diagnoses described, we attempt to categorize and assess associated disability and models of care, seeking to illuminate how care given to these individuals in life reflects agency of these people and their caregivers. By evaluating this assemblage through the Index of Care, we aim to highlight the unique challenges that individuals from these sites faced, and the way that compassion is evidenced in the bioarchaeological record.

Hill, Bryan, II [44] see Prascik, Bethanny

**Hill, Matthew E., Jr. (University of Iowa) and Erik Otárola-Castillo (Purdue University)**

[170]

*Stalking the Bison: Changing Perspectives in the Zooarchaeology of Big Game Hunters of the Great Plains*

In the mid-1980s, Lawrence Todd and colleagues published influential, groundbreaking research in Great Plains zooarchaeology. Todd's pioneering research established innovative methodological and analytical approaches to studying archaeofauna, focusing on large multi-animal bonebeds representing potential kill and butchery sites. This innovative work formed the foundation on which Great Plains zooarchaeologists conduct analysis today, 40 years later. During his career, Todd published several theoretically based and empirically

informed studies presenting fundamental models of the subsistence and land use strategies of North America's early big game hunters. This paper examines how archaeologists' inferences of Great Plains big game hunting have evolved using several of Todd's key early publications as a starting point (e.g., Kelly and Todd 1988; Frison and Todd 1987; Todd et al. 1990). In addition, we assess how new data, methods, and theoretical perspectives have changed our views of Todd's early work and models of human settlement and subsistence practices in the region. Whether Todd's theories or approaches remain in vogue, this paper highlights that more than almost any other researcher, Todd has, directly and indirectly, shaped the course of the following generations of zooarchaeologists.

Hill, Matthew E., Jr. [203] see Thomas, Ariane

Hill, Matthew E., Jr. [137] see Otárola-Castillo, Erik

**Hill, Matthew G. (Iowa State University) and Jason LaBelle (Colorado State University)**  
[170]

*Lawrence C. Todd: Biographical Sketch and Introduction*

Over the course of a five-decades-long career, Lawrence C. Todd, Professor Emeritus, Colorado State University, has made substantive contributions to the practice and theory of anthropological archaeology and world prehistory, introduced thousands of undergraduate students to the discipline in his classes, and formally and informally mentored and advised many other students and colleagues in their projects and career development. The papers in this symposium are a nod to his legacy and a celebration of his career by colleagues and former students, and capture the breadth of his interests and influences.

Hill, Matthew G. [170] see Kappelman, John

Hillis, Dylan [245] see Dierks, Katie

**Hilmer, Hilary (National Park Service) and Dougless Skinner (Bureau of Land Management)**  
[15]

*Ethnoarchaeological Exploration of the Western Brooks Range, Alaska*

The western Alaska Brooks Range contains a diverse arctic ecosystem, scenic landscapes, and deep cultural roots. The foothills of the western Brooks Range crosses BLM, NPS, State, and Tribal lands, and it spans Iñupiaq and Koyukon Athabaskan homelands. Archaeological research from the region is minimal and remains relatively unexplored. This study is a collaboration between BLM and NPS archaeologists to explore cultural practices and material remains from ancestral sites in the area through Indigenous language, traditional knowledge, and oral histories. To pursue this study, the authors conducted literature review, archival research, and listened to oral interviews, then applied this knowledge to material culture from a subset of ancestral sites. Although both authors are outsiders to the Indigenous cultures, through extensive background research they applied an Indigenous methodology to exploring the regions history. Analyzing ancestral sites through Indigenous methodologies provides land managers broadened historical perspectives and establishes diverse mechanisms of investigation during the Section 106 process.

**Hinkelman, Sarah (Ohio State University) and Robert Cook (Ohio State University)**  
[132]

*"There Are No Living Indians": Exploring the Inadequacies of Education in the US Midwest Regarding Native Americans*

In the US Midwest, most students are exposed only briefly to the precontact history in the fourth grade and then not again unless they opt for archaeology as an elective in college. The Ohio Board of Education requires teachers to merely state that American Indians lived in Ohio, participated in the War of 1812, and then died or left the area. Unfortunately, that is the end of the story for many students. This leads to

disturbing trends, including the belief that American Indians are no longer living, the perpetuation of damaging stereotypes about American Indians, and the disregard and destruction of archaeological sites. This study chronicles the prevalence of these trends in our students based on formal interviews of field school students along with a sample of educators, other university students, and visitors at a few archaeological sites. After presenting the findings from the survey, we explore how we can remedy the problem. The hope is that by doing so we can be of service to American Indians that are descendants of this land to reconnect in a variety of ways.

Hipólito, João [95] see Dias, Rita

Hironori, Otani [249] see Kanezaki, Yuko

**Hirth, Kenneth (Penn State University)**

[12]

*Discussant*

**Hirth, Kenneth (Penn State University), Susan Hirth (Independent Scholar), George Hasemann (deceased) and Gloria Lata-Pinto (IAAH)**

[125]

*Reconstructing Synchronous Ritual Events in a Central Honduran Chiefdom: An Analysis of Conjoined Artifacts*

Reconstructing past ritual events is always a challenge under the best of archaeological conditions. Between cal AD 238 and 352 the ancient residents of the site of Salitrón Viejo accumulated an assemblage of carved jade and marble artifacts that were used in a series of ritual activities to dedicate the completion of their central civic-ceremonial precinct. Over 3,000 jade and marble lapidary objects were broken or interred intact in cache deposits as part of this celebration, making it one of the largest collections of high-value regalia recovered from in situ contexts in the New World. A large percentage of these offerings were intentionally broken while others were not. This study reconstructs the meaning and synchronicity of associated ritual events from the artifact conjoins (refits) of broken artifacts in these offerings.

Hirth, Kenneth [150] see Dussol, Lydie

Hirth, Susan [125] see Hirth, Kenneth

**Hitchcock, Robert**

[94]

*Discussant*

**Hitchcock, Robert, Alan Osborn (University of Nebraska, Omaha) and Melinda Kelly (Kalahari Peoples Fund)**

[170]

*Proboscideans, Drought, and Cyanobacteria: Natural Death Events both Present and Past*

Lawrence Todd has made substantial contributions to the studies of taphonomy, Paleoindians, and megafauna, among other topics. His foundational research provides the basis for important questions to be asked about megafaunal extinctions. Drawing first on data on elephant deaths in northern Botswana in 2020 that initially were blamed on poaching and intentional poisoning, this paper considers the possibility of cyanobacteria as playing a role in the mass deaths. It appears that humans were not involved in the deaths of over 300 elephants in the Okavango Delta but instead toxins were a contributing factor. Expanding on that theme, the paper goes on to assess Late Pleistocene megafaunal deaths in North America, some of which may have been

due to toxins that built up around waterholes during times when Paleoindians occupied the Great Plains. Black mats in archaeological sites of megafauna may be indicators of cyanobacteria presence, especially in the Younger Dryas Cold Event when drought and cooler temperatures may have contributed to the buildup of cyanobacteria, which, in turn, contributed to mass deaths of megafauna. These findings suggest that environmental conditions were key drivers of at least some megafaunal deaths both in Africa and in North America.

**Hixon, Sean (Max Planck Institute for the Science of Human History), Alejandra Domic (Pennsylvania State University), Kristina Douglass (Columbia University), Patrick Roberts (Max Planck Institute for the Science of Human History) and Douglas Kennett (University of California, Santa Barbara)**

[68]

*Cut-Marked Bone of Drought-Tolerant Extinct Megafauna Deposited with Traces of Fire, Human Foraging, and Introduced Animals in SW Madagascar*

People could have hunted Madagascar's megafauna to extinction, particularly when introduced taxa and drought exacerbated the effects of predation. However, such explanations are difficult to test due to the scarcity of individual sites with unambiguous traces of humans, introduced taxa, and endemic megaherbivores. We excavated three coastal ponds in arid SW Madagascar and present a unique combination of traces of human activity (modified pygmy hippo bone, processed estuarine shell and fish bone, and charcoal), along with bones of extinct megafauna (giant tortoises, pygmy hippos, and elephant birds), extirpated fauna (e.g., crocodiles), and introduced vertebrates (e.g., zebu cattle). The disappearance of megafauna from the study sites at ~1,000 years ago followed a relatively arid interval and closely coincides with increasingly frequent traces of human foraging, fire, and pastoralism. Our analyses fail to document drought-associated extirpation or multiple millennia of megafauna hunting and suggest that a late combination of hunting, forest clearance, and pastoralism drove extirpations.

**Hlatky, Nicholas and John Fagan**

[171]

*Recognizing Variability: Experiment-Based Insights into Debitage Analysis*

Debitage analysis can be conducted in a wide range of ways, and no standard approach has been broadly accepted. Over the years many attempts have been made to introduce varying classification systems fordebitage analysis. This paper uses experimental archaeology to test different classification systems for accuracy, and to examine how field decisions and sampling design can affect the extent of the interpretive potential for recreating the past activities conducted at an archaeological site.

**Hoag, Elizabeth (Cleveland Institute of Art) and Riley Rist (Minnesota State University, Mankato)**

[211]

*Hands-On in the Classroom: Teaching about the Past to Undergraduate Art Students*

Pedagogical studies in higher education repeatedly underscore the importance and effectiveness of hands-on, deep learning as a means for student engagement and connection with subject matter. In this paper we outline several engaged activities and techniques employed in anthropology and archaeology classes at a college of art and design. These classroom activities are explored here by instructors, including a former undergraduate art student who participated in these activities in the classroom, and now employs these methods as an anthropology graduate student instructor. We demonstrate that through these creative approaches to the study of the past, students come away from these classes with a deeper understanding and appreciation of anthropological and archaeological inquiry, Indigenous cultural achievements, and can make connections with course matter across other disciplines and fields.

Hockett, Bryan [25] see Dillingham, Frederic

Hockett, Bryan [43] see Johnson, Taryn

Hodapp, Magen [214] see Burke, Chrissina

Hodapp, Magen [122] see Coppola, Anna

Hodapp, Magen [71] see Priest, Brooke

**Hodge, Phil (Tennessee Division of Archaeology)**

[120]

*Discussant*

**Hodge, Shannon (Middle Tennessee State University)**

[149]

*Chair*

**Hodge, Shannon (Middle Tennessee State University)**

[149]

*Archaeology Education in Bioarchaeology and Human Osteology: Value and Values of Experiential Service Learning*  
Human osteology and bioarchaeology remain an important part of archaeological practice, transitioning from a focus on legacy collections to service and compliance work rooted in the ethics of direct engagement with descendant communities. Higher education and archaeology can partner in new ways that center respect for precontact and historic era ancestral remains and yield well-trained graduates who have osteological data collection skills and abilities, and more importantly deep respect for the people whose remains they encounter archaeologically. This paper addresses best practices for undergraduate engagement with ancestral remains, known outcomes and benefits to students and partners, and presents case studies for partnering with state and federal agencies, CRM firms and museums / nonprofits who directly engage with descendant communities. With decades worth of new infrastructure development poised to commence, not to mention widespread residential and commercial development, human remains will continue to be inadvertently discovered and it behooves us to train future archaeologists to approach ancestral remains responsibly and respectfully. Images of human remains will not be shown in this presentation, though images of laboratory contexts with remains blacked out may be shown.

**Hoferitza, Michele (Utah State University)**

[6]

*Compositional Analysis of Prosser Molded Beads Found in Southeast Idaho*

In 1864, a factory in Briare, France, began producing Prosser Molded beads for African and North American trade. The beads were made using a novel process combining milk as a binding agent to powdered feldspar, calcium fluoride, silica sand, and coloring elements to create a paste that was pressed into molds, then fired in a kiln. The process was subsequently used in a factory in Gablonz, Bohemia, beginning around 1887. Identifying the factory of origin for Prosser beads based on elemental composition may lead to a greater understanding of the distribution of beads from Europe to Native Americans in the West through trading post and mercantile exchange networks. In this study, X-ray fluorescence (XRF) analysis of a collection of Prosser beads of various colors found in southeastern Idaho indicate dramatic variation between elemental composition of the beads, even between beads of visually similar colors. The variations are examined to determine if coloring elements of copper and cobalt can be diagnostic of which factory manufactured the beads. Improved accuracy in determining the source of Prosser Molded beads using XRF analysis provides critical insights into the development of late nineteenth- and early twentieth-century trade networks across two continents.

**Hoffman, Matthew (Center for Applied Archaeological Science, Boise State University) (Return of Boise Valley People's Members), Jake Fruhlinger (Orchard Combat Training Center [OCTC]), Linda Reynard (Stable Isotope Lab, Boise State University) and Erick Robinson (Center for Applied Archaeological Science, Boise State University)**  
[94]

*Reanalyzing Dry Creek Rockshelter: A New Path Forward for Idaho Archaeology*

Dry Creek Rockshelter provides important evidence for the deep history of human occupation in the Boise foothills. Our recent reinvestigation of this site suggests a reinterpretation of its occupation history. This work provides a new model for collaboration between archaeologists and Native American communities. We show how advances in archaeological science can be accompanied by ethical and collaborative relationships with Upper Snake River Tribes to develop coproduced archaeological research, teaching, and heritage management. This work sets a new foundation for archaeology in Idaho that seeks to work with communities to meet their heritage management traditions and contemporary preservation initiatives.

Hoffman, Megan [104] see Schmidt, Christopher

Hoffmann, Tanja [20] see Lyons, Natasha

Hofman, Courtney [118] see Buckser, Sasha

Hofman, Courtney [100] see Singleton, Robin

Hogg, Alan [139] see Giersz, Milosz

**Hoggarth, Julie (Baylor University), Jaime Awe (Northern Arizona University), Brendan Culleton (Pennsylvania State University), John Walden (Harvard University) and Douglas Kennett (University of California Santa Barbara)**  
[228]

*Dating Postclassic Maya Occupation in the Belize River Valley*

Gordon Willey's pioneering work in the Upper Belize River Valley presented some of the first perspectives on household and community archaeology in the Maya Lowlands. Beginning with that work, scholars came to identify Postclassic occupation at sites along the Belize River, primarily at Barton Ramie and later at Baking Pot. However, the Barton Ramie excavations did not provide clear details on occupation after the collapse, given that Postclassic ceramics were only identified after excavations were complete. Willey (1973) presented two contrasting scenarios for the nature of Classic to Postclassic depopulation of the Belize Valley. The first proposed Classic to Postclassic continuity, with slow depopulation over the span of several hundred years between AD 900 and 1300. In the second, he proposed for discontinuity between periods, possibly with population replacement, based on major changes in ceramics between the Classic and Postclassic. Today, most scholars have emphasized the narrative of continuity between periods (at least at Barton Ramie), although recent radiocarbon research (Hoggarth et al. 2014) has questioned that scenario. We discuss a targeted radiocarbon dating program aimed at differentiating these scenarios and elucidating the nature of depopulation in the Upper Belize Valley.

Hoggarth, Julie [11] see Awe, Jaime

Hoggarth, Julie [101] see Ellis, Olivia

Hoggarth, Julie [76] see Meyer, Brett

Hoggarth, Julie [45] see Roa, Ian

Hoggarth, Julie [165] see Walden, John

**Holcomb, Justin (University of Kansas), Jordan Thompson (Washington State University) and John Blong (Washington State University)****[179]**

*Revisiting Kelly Forks (10CW34): Current and Future Research at a Western Stemmed Tradition Occupation in the Nez-Perce Clearwater National Forest, Idaho*

The Kelly Forks Work Center Site (10CW34) is located in the Nez Perce-Clearwater National Forests, Idaho, and has an occupation sequence spanning the terminal Pleistocene (Western Stemmed Tradition or WST) through the historic period. The site is within the homelands of the Nimíipuu (Nez Perce) Tribe, in an upland area traditionally important for late summer and early fall subsistence activities. The WST component at Kelly Forks offers an opportunity to investigate the antiquity of Nimíipuu upland subsistence practices, seasonal land-use patterns, and the age of the WST in the Intermountain West. Previous research at the site recovered WST projectile point fragments in potential association with charcoal dating to 13,700 cal yr BP. However, questions remain about the association between these artifacts and dates. In 2021 and 2022, we revisited the site and opened a new 3 × 2 m excavation block to clarify the stratigraphy and geochronology. Here, we present preliminary results of ongoing geoarchaeological and archaeological research. These data suggest that Kelly Forks contains buried, well-stratified, and intact deposits, with potentially four buried surfaces spanning the Late Pleistocene to Holocene.

Holcomb, Justin [15] see Norman, Lauren

**Holdaway, Simon (University of Auckland)****[168]**

*Reuse and Assemblage Composition, from Tools to Flakes*

In 1984, Harold Dibble published his iconic scraper reduction paper. This publication, and the many that followed, played a significant role in realigning the discipline from one that retained a focus on artifact typology as the foundation for both culture historical and functional interpretations of the Paleolithic. Harold showed that what were assumed to be discrete tool types instead related to a process or tool resharpening, meaning that differences in tool type proportions might signify neither distinct culture groups nor functional artifact sets. Scraper reduction modeled changes in the morphology of retouched tools but also related these changes to artifact assemblage composition as a function of tool reuse. In Australia, Harold's work inspired a new generation of studies, both on retouched tools and ironically on unretouched flakes. While some studies investigated the equivalent of Paleolithic scraper reduction, another set of studies investigated artifact reuse through flake removal. Using geometric measures to evidence flake transport, these later studies as reviewed in this presentation, provided a new understanding of assemblage composition, one related to the long-term history of artifact movement across landscapes.

Holdaway, Simon [33] see Barrett, Matthew

Holen, Kathleen [71] see Holen, Steven

**Holen, Steven (Center for American Paleolithic Research) and Kathleen Holen (Center for American Paleolithic Research)****[71]**

*Human-Induced Percussion Technology: A Synthesis of Bone Modification as Archaeological Evidence*

Animal bone modification by humans has long been part of the archaeological record; however, debate continues as to whether this evidence alone is sufficient to interpret human activity. This is especially true if such evidence is used in support of archaeological sites older than 16 ka in the Americas. We synthesize data representing over three decades of research including experimental bone breakage and archaeological excavations of proboscidean assemblages. Replicable features of percussion and use wear patterns on bone elements are described along with interpretive methods which demonstrate analogous, concurrent, and anomalous patterns that represent human behavior. Geological contexts that rule out alternative causes of

percussion breakage are also described. We conclude that bone modification by percussion can be strong evidence of human behavior when interpreted in the light of experimental reference samples, analogous archaeological sites, and geological context. The age and geographic location of a site does not invalidate this evidence.

**Holguin, Brian (University of California, Santa Barbara), Eleanor Fishburn (California State University, Channel Islands), Scott Sunell (Camp Pendleton Marine Corps. Base), Jennifer Perry (California State University, Channel Islands) and Gina Lucas (California State University, Los Angeles)**

[181]

*Harvesting Seagrass at l'akayamu*

This project is a collaborative effort driven by a multi-tribal Chumash community to reawaken cultural knowledge while simultaneously generating new archaeological data about the well-preserved Chumash village of l'akayamu. Located on limuw (Santa Cruz Island, the largest of California's Channel Islands), l'akayamu is a historical village that was connected to broader sociopolitical and economic systems in the Chumash world. During a recent multi-tribal excursion to limuw, seagrass cordage was identified in eroding deposits at l'akayamu. Subsequently, the tribal chair of the Barbareño Band of Chumash Indians made a request for the cordage to be excavated in order to preserve the item, while reawakening and maintaining tribal knowledge of manufacturing cultural items using seagrass. Dr. Jeanne Arnold's prior research at the village focused on site structure, intra-site relationships between households, and inter-village variability on Limuw. The cordage excavation presents a unique opportunity to directly build on Dr. Arnold's research with minimally invasive techniques. Most importantly, this project is designed to ensure that knowledge about traditional material culture is developed for and by the Chumash community itself, supporting the acquisition and application of Chumash cultural knowledge for the future.

Holland, Rachel [205] see Lorenz, Samantha

**Holland-Lulewicz, Isabelle (Pennsylvania State University) and Jacob Holland-Lulewicz (Pennsylvania State University)**

[218]

*A Network Approach to Zooarchaeological Datasets*

Zooarchaeological datasets are often large, complex, and difficult to visualize and communicate. Many visual aids and summaries often limit the patterns that can be identified and our interpretations of relationships between contexts, species, and environmental information. The most commonly used of these often include bar charts, pie charts, and other such graphs. These aid in categorizing data and highlighting the differences or similarities between categories. While such simplification is often necessary for effective communication, it can also obscure the full range of complexity of zooarchaeological datasets. In this paper, we demonstrate the utility of formal network graphs to capturing the complexity of zooarchaeological datasets and to effectively highlighting the kinds of relationships between contexts, time, and faunal assemblages in which zooarchaeologists are primarily interested. Using a case study from southwestern Florida (USA), we argue that network graphs provide a quick solution to visualizing the structure of zooarchaeological datasets and serve as a useful aid in interpreting relational patterns, especially those indicative of environmental change and human behavior through time and across space.

**Holland-Lulewicz, Jacob (Pennsylvania State University), Raelynn Butler (Muscogee Nation), Turner Hunt (Muscogee Nation), Amanda Roberts Thompson (University of Georgia) and Victor Thompson (University of Georgia)**

[74]

*The Early Spread of Peaches (Prunus persica) across Spanish La Florida and their Importance for Modeling Archaeological Chronologies and Indigenous Networks*

Peaches were ubiquitous across eastern North America by the mid-seventeenth century, less than 100 years

after the founding of St. Augustine in 1565, the earliest possible cultivation date for peaches in what is today the United States. As such, preserved or charred peach pits at archaeological sites, each with a built-in terminus post quem of c. 1565, have the potential to be used to substantively refine and resolve chronologies for early Indigenous-colonizer dynamics across the southeastern United States. This is particularly important because the nature of the radiocarbon calibration curve has historically thwarted attempts at high resolution contact-period chronologies that do not rely on materially based chronologies (e.g., the presence or absence of certain kinds of European materials). In this paper, we date peach pits via AMS from archaeological sites across Georgia to (1) demonstrate their utility in refining archaeological chronologies, (2) formally track their rapid spread, and (3) infer properties of Indigenous networks, including their general structures at the time of European colonization and the potential temporality of flows through these networks. The implications of this study thus extend to the potential network foundations of postcontact economic participation, sociopolitical transformations, and the spread of introduced diseases.

Holland-Lulewicz, Jacob [218] see Holland-Lulewicz, Isabelle

**Hollenbach, Kandace (University of Tennessee)**

[130]

*Beyond Boiling and Baking? Cooking Plant Foods in the Early US Midsouth*

In the Eastern Woodlands of North America, researchers tend to discuss cooking technologies of early foragers at the close of the Pleistocene and early Holocene in terms of nut processing rather than for use of geophytes, as is more common in the Plains and West regions. While the widespread availability of hickories and chestnuts may partly account for this, the difficulty of identifying geophytes using macrobotanical remains and standard paleoethnobotanical techniques is also a factor. Here I review the macrobotanical data in tandem with the feature assemblages from Dust Cave, Alabama, and the Tellico sites in Tennessee, where extensive in situ occupations dating to the Late Paleoindian and Early Archaic periods have been documented. I consider the data expressly in terms of cooking technologies in a region where fuel wood was likely not scarce, and how these technologies changed as foragers adapted to changing Holocene conditions. I also discuss opportunities for recognizing geophyte use at these sites.

**Hollenback, Kacy (Southern Methodist University)**

[151]

*Chair*

**Hollenback, Kacy (Southern Methodist University) and Sarah Trabert (University of Oklahoma)**

[151]

*Recent Trends in North American Great Plains Archaeological Research*

The North American Great Plains physically encompass one third of the contemporary United States and include the international border with Canada. The region has been occupied for at least 16,000 years, with some of the oldest sites in North America. Although the Plains have often been considered peripheral to major developments in adjacent regions, we demonstrate where current debates stand and that Plains archaeology is relevant and important for addressing broader research questions. This paper examines regional research trends from 2015 to 2022 through an analysis of articles published in major peer-reviewed journals, selected edited volumes, and books. Emphasis is placed on methodological, theoretical, and key findings that interface with surrounding regions in North America. We highlight and build upon cross-regional dialogue surrounding themes such as migration and movement, conflict, social networks and connections, contact and colonialism, as well as decolonizing approaches and Indigenous archaeologies.

Hollenback, Kacy [124] see Haug, Jaxson

**Hollis, Geena****[105]***Behind the Creation of Archaeogames: Character Art*

The interest in playing video and card games has increased rapidly throughout the past three decades. In the last two decades, the interest in archaeogaming has increased. When archaeogames are discussed, the conversation tends to relate around the educational aspect of the games, which is very important. What is often left out of the discussion is the art involved with archaeogaming. Transferring research into contemporary and captivating styles for target audience's ages but also historically accurate art is complex. The focus on this poster is the artist's process of creating characters for archaeogaming such as illustrations for card and video games, and educational lessons and modules surrounding archaeogaming. On this poster, I will show my own creative process of creating character illustrations based off of real, historical figures and mythologies for the archaeogaming education modules (AEMs) for the organization Save Ancient Studies Alliance. Alongside my own work will be the work of artists from popular archaeology inspired tabletop and video games. This poster will highlight the "how" and the "why" character art design is a key element in piquing interest and lure to archaeogaming and in turn, archaeology itself.

**Holly, Donald (Eastern Illinois University), Christopher Wolff (University at Albany) and Amanda Samuels (University at Albany)****[49]***Excavations at Inspector Island, Newfoundland, Canada*

Inspector Island is a large, multicomponent site located in Notre Dame Bay, on the island of Newfoundland, Canada. The site was first discovered and excavated by Ralph Pastore of Memorial University in the 1980s, and then revisited and re-excavated this past summer by the two lead authors. Excavations indicate a large Maritime Archaic habitation site across the lowest levels of the site, overlaid in turn by a thin lens of Paleolnuit material, an ancestral and historic Beothuk occupation, and recent European/settler activity. Despite coastal erosion, and the destructive effects of development and looting, remaining intact portions of the site offer an exquisite glimpse of a rare Maritime Archaic habitation site, as well as a window into changes to the Beothuk wrought by the arrival of European fishermen and settlers.

Holly, Donald [219] see Samuels, Amanda

Holly, Donald [219] see Wolff, Christopher

**Holm, Emma (National Park Service)****[72]***Managing Multiple Heritages: A Case Study of the Ohanapecosh Area, Mount Rainier National Park*

The Ohanapecosh Area of Mount Rainier National Park contains diverse historic properties associated with multiple types and periods of Significance. The managerial requirements for the cultural resources are, consequently, equally diverse. The resources are archaeological, ethnographic, and structural in nature, and they are associated with the heritages of the park, colonial entrepreneurialism, and a local Tribal Nation. Heritage management at Ohanapecosh is further complicated by the boundaries of a historic archaeological district and several precontact archaeological sites occupying the same physical spaces without being managed as one, multicomponent site. The archaeological district and the ethnographic landscape—the Ohanapecosh hot springs area—also share the same geographic space. Considering potential adverse effects to these cultural resources requires drafting resource management recommendations consistent with their Significances. Completing this process also reveals the pragmatic challenge of cultural resource management where, in practice, resources are given unequal stewardship. Highlighting complex cultural resource management case studies such as the Ohanapecosh Area fosters discussion about how cultural resource management occurs as applied practice and how practitioners can find themselves responsible for the stewardship of multiple heritages.

**Holmes, Charles (University of Alaska, Fairbanks), Ben Potter (University of Alaska, Fairbanks) and Joshua Reuther (University of Alaska Museum of the North)**  
[15]

*Assessment of the Archaeological Record for the Tanana Valley, Alaska, and a New Cultural Synthesis*

The archaeological record in the Tanana Valley region has accrued for almost a century and investigators have applied a variety of different naming schemes for these complex archaeological records. There is a need to synthesize nomenclature for these cultural phenomena. In general, archaeologists have fitted identified components into broad familiar cultural units (e.g., Denali complex, Northern Archaic tradition) and by age. We examine cultural chronologies and data at the assemblage level and evaluate current cultural designations to provide a common terminology across the region. Also, we introduce some new designations that address a more comprehensive cultural sequence for interior Alaska.

Holmes, Charles [15] see Crass, Barbara

Holmes, Charles [15] see Kielhofer, Jennifer

Holmes, Charles [15] see Wygal, Brian

Holmes, Grace [104] see Schmidt, Christopher

**Holyoke, Kenneth (University of Lethbridge) and Branden Rizzuto (University of Toronto)**  
[126]

*CCGS 2022: More Data on Sources and Sourcing for Carboniferous Cherts in New Brunswick, Canada*

The Carboniferous Chert Geoarchaeological Survey (CCGS) was initiated in 2019 in order to identify and characterize the distribution of geological occurrences of Carboniferous-aged cherts in New Brunswick, Canada, and, to better understand the archaeological exploitation of those lithic materials. Initial fieldwork associated with the CCGS sought to collect geological samples of chert from multiple occurrences in order to conduct non-destructive geochemical analyses of source-derived samples using handheld (portable) energy-dispersive X-ray fluorescence spectrometry (hhXRF or pXRF). During the course of this preliminary fieldwork, Holyoke identified a possible secondary source location for so-called Washademoak Multi-coloured Chert (WMCC) at Henderson's Settlement (site BIDn-21) and testing in 2022 confirmed Indigenous use of the source for making stone tools. In this paper, we expand on geochemical analyses for source discrimination between Henderson's Settlement and the previously known quarry at Belyeas Cove using data derived from Scanning Electron Microscopy–Energy Dispersive X-ray Spectroscopy (SEM-EDS) and Neutron Activation Analysis (NAA). Further, we introduce the findings from BIDn-21 and discuss implications for understanding where ancestral Indigenous groups were obtaining chert previously glossed as WMCC, and how these findings inform ongoing sourcing studies of the region's cherts.

**Homsey-Messer, Lara (Indiana University of Pennsylvania), Kristina Gaugler (Carnegie Museum of Natural History) and Kevin Gubbels (Western Archaeological Services)**  
[239]

*An Experimental and Ethnographic Approach to the Analysis of Fire-Cracked Rock at Three Monongahela Sites in Southwestern PA: The Case for a Middle Monongahela Stone Boiling Technology*

Despite being a ubiquitous artifact class, fire-cracked rock (FCR) has been largely overlooked in traditional archaeological studies. Due in part to its sheer abundance and cumbersome nature, FCR is often more cursed for its space consumption than embraced for its interpretive potential. As a result, the archaeological literature offers little discussion regarding the nuanced perspective that FCR research can impart to archaeologists' understanding of prehistoric cooking and food processing technologies. Using an experimental and ethnographic approach, this paper investigates the use of stone at three Monongahela villages in southwestern Pennsylvania. Results suggest that both dry roasting and stone boiling technologies were used. Additionally, residents appear to have preferentially selected high-quality stones for their thermal resistance and potential for reuse. These findings suggest that the adoption of ceramics does not preclude the use of

stone boiling and that greater variability in Monongahela cooking technologies may have existed than previously thought.

Honap, Tanvi [163] see Johnson, Sarah

Honap, Tanvi [163] see Palacios, Horvey

**Hondelink, Merit (University of Groningen, the Netherlands)**

**[208]**

*Searching for Clues: Processing-Wear Analysis on Waterlogged Edible Plant Remains in Archaeobotanical Samples*

The archaeobotanical remains of several cesspits and wells from Delft were analyzed to determine if “preparation marks,” marks on plant remains resulting from specific preparation methods, are present and if these marks can be used to differentiate between kitchen refuse and consumption waste or excrement. By combining the results from archaeobotanical analysis with historical recipes and experimental research, it was possible to associate a number of preparation marks with a specific type of preparation method, such as chewing, pressing, cutting, and cracking. Though other types of preparation methods were more difficult to distinguish, this study shows that in some cases it is possible to distinguish between kitchen refuse and consumption waste or excrement. This type of analysis will help us move beyond the traditional research questions of which species people consumed in the past; it will inform us how they processed these food items.

Honegger, Matthieu [212] see Bicho, Nuno

Honeychurch, William [24] see Hanks, Bryan

Honeychurch, William [244] see Wright, Joshua

**Hoobler, Ellen (Walters Art Museum)**

**[230]**

*Zapotec Funerary Rites as Documented by Alfonso Caso: Mining Archival Materials to Understand Ancient Ritual Behavior at Monte Albán*

The precolumbian site of Monte Albán in Oaxaca, southern Mexico, presents a continuing challenge for scholars because the earliest scientific excavations at the site, conducted in the 1930s by noted archaeologist Alfonso Caso and his collaborators, were only partially published. This is particularly disappointing since many of the tombs of Monte Alban were undisturbed from precolumbian times until their discovery in the twentieth century, and the lack of data from the Oaxacan area is in stark contrast to much better documented Maya tombs and burials. Caso left unexpectedly detailed records on the contents of the tombs, however, creating thousands of catalogue cards to document the placement of their contents. Using these and other archival records, it is possible to recreate some of the tombs and their context, ultimately drawing some conclusions about overlooked facets of Zapotec funerary rituals.

**Hoopes, John (University of Kansas)**

**[40]**

*Moderator*

**Hoover, Corey (Louisiana State University)**

**[55]**

*Land-Use Change and Its Impact on Archaeological Sites in the Nepeña Valley, Peru*

The Nepeña Valley, located in northern Peru, is home to several important archaeological sites spanning the

complete prehistoric chronology in the Peruvian Andes. During the COVID pandemic after 2019, much of the oversight and efforts at cultural preservation and archaeological preservation were halted due to a national shutdown. During this shutdown, land traffickers, agricultural companies, and individuals took advantage of the lack of oversight and worked to expand their prospects, often coming into contact with historical sites in the valley. This investigation uses satellite imagery and classification techniques to discuss the amount of change and encroachment that has taken place during the COVID-19 pandemic and its possible impact on cultural heritage and preservation efforts.

**Hoover, Hannah (University of Michigan), Maria Cunningham (Cranfield University), Erin Niles (Kleinfelder) and Cynthia Robin (Northwestern University)**  
[243]

*Aventura's Households from Commoners to Elites*

Household archaeology provides a powerful lens to understand people, their daily lives, and the myriad social, political, economic, and environmental relations that link people, households, and communities to broader societies. For its first decade of research, the Aventura Archaeology Project conducted a study of urban households situated within a 1 km<sup>2</sup> area of the city's epicenter. Assessing Aventura's urban households is key for understanding the operation of the city. This presentation provides an overview of 12 household excavations at Aventura, 11 conducted between 2016 and 2022 and one in 2007 by the Belize Institute of Archaeology. A range of households from commoners to elites were included in our sample to bring to light a picture of the diverse populace of the city. Detailed household studies allow us to envision Aventura as a dynamic and lived place. We examine domestic architecture, the use of space, and domestic artifact assemblages to showcase household life within the city, changes through time, and the role of households in facilitating the longevity of city and community. These households both shaped and were shaped by broader forces at Aventura and in the Maya world.

**Hoppa, Kristin (Channel Islands National Park)**  
[135]

*Limuw as a Cultural Landscape: Precontact Sites on Eastern Santa Cruz Island*

Eastern Santa Cruz Island has a high density of archaeological sites dating from 10,000 BP through historic contact, and at least seven associated Chumash place names. The area has freshwater seeps, abundant chert toolstone, and access to rich marine resources, including boat anchorages. At the time of historic contact, the largest Chumash village on the northern islands, Swaxel, was located at Scorpion Anchorage. The Late period microblade and related shell bead industry were prominent on Eastern Santa Cruz Island, where there is a high density of chert quarry sites. This paper addresses the results of intensive survey from 2020 to 2022 within the broader context of the island's prehistory, including the distribution of sites through time and the mobility and settlement patterns of the Island Chumash.

**Hoppes, Kelsey, Sarah Kurnick (University of Colorado, Boulder) and Samantha Fladd (University of Colorado, Boulder)**  
[131]

*The Names We Know: Labor and Prestige in Archaeological Publishing*

In 1985, Joan Gero published an article in *American Antiquity* arguing that archaeologists conform in their professional roles to stereotypical American gender roles: publicly visible, dominant men collect and publish data and passive, publicly invisible women do the "archaeological housework." This presentation evaluates whether and to what degree the adoption of such gender roles is still evident in archaeological practice by analyzing the identities of lead authors of articles with five or more collaborators published in a variety of journals. In doing so, it seeks to move understandings of gender bias beyond the dichotomies often characteristic of second wave feminist approaches and consider instead intersectional identities. Who is most often the lead author on publications with five or more authors? Have the identities of these lead authors changed over time? And, does the identity of the lead author correlate with factors such as the topic of the

article or the type of journal in which it is published? Importantly, this presentation seeks not only to answer these questions, but also to consider their causes and consequences, particularly as related to labor, fit, and prestige.

**Hopt, Justin (Historical Research Associates)**

[194]

*Discussant*

**Hopwood, Marie (Vancouver Island University)**

[222]

*Chair*

**Hopwood, Marie (Vancouver Island University)**

[222]

*In the Reed Buckets There Is Sweet Beer: An Archaeology of Beer, Brewing, and Women in Mesopotamia*

“Like the onrush of the Tigris and the Euphrates,” the filtered beer pours into collection vats and from there into serving jars and beakers for the happy drinkers. Or so the Hymn to Ninkasi suggests. By the time the poet impressed those words into clay, beer had been brewed for generations with the practiced gestures and established stages evident in prose. Yet before the hymns, before the taverns, and before temple breweries there was the home-based brewing that began it all. It is largely accepted that women were the first brewers, crafting this beverage for their households, daily consumption, and feasts. How can we “see” the labor of these women archaeologically? While the best way to “see” beer is through pottery residue analysis, the process goes beyond this. Some lines of evidence can preserve well, including brewing vessels, ceramic strainers, beer residues, beakers, and at times carbonized, malted grain. Are there other traces that that might not survive well, such as reed buckets, organic straws, and even cloth filters? Through this paper I explore the broader context of brewing in ancient Mesopotamia, with a focus on the operational chain of brewing and the gendered practices of this deeply ancient libation.

**Hora, Elizabeth (Utah State Historic Preservation Office), Ian Wright (Utah State Historic Preservation Office), Matthew Podolinsky (Utah State Historic Preservation Office) and Lexi Carson (Utah State Historic Preservation Office)**

[167]

*Use It or Lose It: How to Activate Public Stewards to Protect Archaeological Sites*

In 1996, the SAA enshrined Stewardship as Principle No. 1 for a reason: without stewards of the archaeological record, there is no hope for its long-term preservation. Many of us are satisfied with our own roles as site caretakers, but in Utah, it was not enough. Repeated and dramatic cases of damage prompted lawmakers to take action, and in 2020 the Utah SHPO launched the Cultural Site Stewardship Program. Come hear how over 300 stewards and professional archaeologists are facing down the threats to Utah’s record, and learn how you can apply these same tools to preserve the past where you live and work.

Hora, Elizabeth [155] see Podolinsky, Matthew

Horcajada Campos, Patricia [34] see Vázquez de Ágredos Pascual, María Luisa

**Horn, Christian (University of Gothenburg)**

[213]

*All in One Boat: How to Keep a Raiding Party Together in Bronze Age Southern Scandinavia*

For southern Scandinavia, the evidence of use-wear on weapons and of violent encounters settled the long

debate over whether prehistoric warfare existed. Much of this violence was driven by waterborne raiding parties and maritime warriors and successful participation in fighting provided a path to social status. Each expedition lasted probably for several weeks during which the boat crew was in close confines and the members were perhaps never separated for extended periods of time. This volatile atmosphere in which every individual was used to carry out violence and such violence provided a pathway to personal advancement provided a social challenge that the leaders and organizers of these expeditions needed to solve. How to keep the cohesion and prevent the outbreak of inner-group competition that may spill over into violence? Looking at rock art and weapon depositions, the Turnerian concept of *communitas* among liminal agents is discussed as a possible answer that leaders of such raiding parties may have relied on. But how do we explain later depictions of large and highly detailed warriors onboard boats? Here it is argued that these may depict named ancestors rather than living leaders of such journeys.

**Horn, Sherman (University of California, Santa Barbara), Justin Tran (University of California, Santa Barbara) and Anabel Ford (University of California, Santa Barbara)**

[165]

*Modeling the Milpa-Cycle at Classic Period El Pilar: A New Method for Assessing Maya Subsistence Production*

The ancient Maya city El Pilar was founded in an ecotonal location, where the karstic ridgeland of the greater Petén grade into the alluvial Belize River Valley and coastal plain. Established early in the Middle Preclassic (ca. 1000 BCE), El Pilar grew into a major center that dominated its surroundings in Late Classic times (600–900 CE). The expansion of the city rested on successful adaptations to the tropical forest environment that provided food and other necessities to its growing agrarian population. Survey and mapping of the 20 km<sup>2</sup> surrounding El Pilar reveal a highly detailed picture of settlement and land use that can be used to model subsistence adaptations. Identification of primary residential units provides the input for population estimates, and the distribution of architecture and other cultural features illuminates how the Maya of El Pilar shaped and managed their landscape. This paper considers these human imprints against the topographic backdrop revealed by lidar to quantify potential subsistence production based on traditional Maya farming practices. We explore the possibility of agricultural intensification to meet the needs of a growing population in the absence of large investments in infrastructure, of which there is little evidence in the area surrounding El Pilar.

**Horn, Sherman (University of California, Santa Barbara)**

[165]

*Chair*

Horn, Sherman [165] see Tran, Justin

**Horowitz, Rachel (Washington State University), Damien Marken (Bloomsburg University of Pennsylvania) and Damaris Menéndez (Instituto Politécnico de Tomar)**

[129]

*Utilitarian Lithics as Commodities: Comparing Classic Period Specialized and Multi-craft Producers in the Maya Lowlands*

Economic studies in the Maya region have illustrated that the Classic period Maya utilized a variety of exchange networks to circulate commodities such as market exchange, redistribution, and gifting. The study of specific types of goods provides information on how different materials circulated through these exchange mechanisms in the past. We use case studies from two distinct areas of lithic production to compare the types of production and exchange of utilitarian lithic implements. Comparisons will be made between specialized production workshops, using data from biface production areas in western Belize (the Succotz and Manzanero Lithic Workshops), and from multi-crafting households where lithics were produced to use as part of the production of other material goods, using data from the Tres Hermanas District at the site of El Perú-Waka' in the Petén region of Guatemala. Lithic production data in these cases illustrates variability in the ways that lithics were produced, exchanged, and used among the Classic period Maya, shedding light on the commodification and value of lithic implements during this period.

Horowitz, Rachel [129] see Brown, M. Kathryn  
Horowitz, Rachel [242] see Navarro-Farr, Olivia

**Horsley, Timothy (Horsley Archaeological Prospection LLC)  
[202]**

*Geophysical Survey Results from the Chengdu Plain Archaeological Survey*

This poster presents a sample of the results of geophysical investigations conducted as part of the Chengdu Plain Archaeological Survey. Magnetometer surveys were undertaken at more than 20 locations to augment the results of surface collection survey and augering, helping to locate buried features as well as characterize and delineate archaeological sites. By detecting subsurface geomorphological features, this work also helps to situate sites in their landscapes. This poster discusses some of the challenges presented by the modern ground conditions and deep natural and cultural deposits, and highlights the benefits of integrating a geophysical approach to landscape studies in similar environments.

**Horton, Elizabeth (National Park Service), Jen Harrington (University of Montana, Missoula)  
and Dean Nicolai (Salish Kootenai College)**

**[182]**

*Connecting Past with Present: Tribal Partnerships with the Yellowstone Archeology Program*

This poster highlights the unique partnerships between the Archeology Program, Yellowstone National Park, and the Native American Natural Resource Program, University of Montana, Missoula, and the Native American Studies Department, Salish Kootenai College. Consisting of internships and an Indigenous Archaeology field school, these partnerships are designed to provide educational, personal development, and professional growth opportunities to Native American students while living and working in the park. Student participants gain hands-on experience in natural and cultural resource management and resource education, as well as planning, research design, analysis, and interpretation phases of fieldwork. We not only discuss the challenges and successful strategies implemented to increase student engagement but also highlight student experiences. These partnerships are deepening our understanding of the past archaeological record and its importance for nurturing connections for those in the present.

Horton, Elizabeth [94] see Lee, Craig  
Horton, Elizabeth [8] see Samuelsen, John

Hosek, Lauren [124] see Bader, Alyssa

**Hosken, Kaitlyn (HDR) and Travis Shinabarger (HDR)  
[234]**

*Cultural Resources Investigations of YUSDISHLAQ', a Historic Dena'ina Village on Alaska's Lower Susitna River*

This presentation discusses the history and identification of YUSDISHLAQ', a nineteenth-century Dena'ina village on the lower Susitna River in southcentral Alaska, USA. According to ethnographic and historical accounts, YUSDISHLAQ' was situated on an island near Susitna Station, a settlement on the historic Iditarod Trail. YUSDISHLAQ' was reportedly the site of the first Russian Orthodox church in the Susitna basin in the 1860s or 1870s, and the birthplace of prominent Dena'ina elder, Shem Pete. A flood destroyed the village in 1898. As part of the federal review process for a proposed road development, cultural resources investigations in 2021 relocated the site of YUSDISHLAQ', including numerous historical artifacts and two possible features. In conjunction with other known sites in the area, these discoveries provide new insights into the historic landscape of the lower Susitna. As access to the site is currently very limited, it also raises questions about how the proposed road may increase public visitation and other potential effects to cultural resources.

**Houk, Brett (Texas Tech University) and Brooke Bonorden (Pape-Dawson Engineers)**  
[129]

*Chicle and the San Pedro Maya of British Honduras*

Archaeological evidence suggests sapodilla (*Manilkara zapota*), constituted an important resource for the ancient Maya. They harvested its fruit, used its wood in construction, and extracted latex—better known as chicle—from the tree for a variety of uses, including as chewing gum. The ancient Maya's management of the species may be responsible for its ubiquity near Maya ruins today. With the birth of the chewing gum industry in the United States in the late 1800s, chicle became an important commercial export for Guatemala, British Honduras, and the Yucatan. Coincidentally, the rise of the chicle industry corresponded with the resettlement of northwestern Belize by the San Pedro Maya, a group displaced by the Caste War in Mexico. Forced to pay rent for their lands, the San Pedro Maya turned to chicle harvesting in the early twentieth century to acquire cash. While chicle extraction was presumably easy to incorporate into their established routine of harvesting forest products, the adoption proved to be detrimental for the San Pedro Maya. In this paper, we examine historical information and archaeological data from Kaxil Uinic village to explore the relationship between the chicle industry and the San Pedro Maya of British Honduras during the early 1900s.

Houk, Brett [205] see Gallareta Cervera, Tomás

Houk, Brett [189] see Novotny, Claire

**Houston, Stephen (Brown University)**  
[236]

*Discussant*

**Houston, Stephen (Brown University)**  
[11]

*Foreign Intimacies: Terminal Classic Shells, Novel Identities, and Gathered Elites*

For close to a century, a remarkable set of shells have been found archaeologically across the Maya region and beyond. Most likely shaped and incised in a single workshop, they present a decided paradox, depicting specific warriors and elites yet, on these Terminal Classic shells, in varied and dispersed settings. The scenes are also, in a few examples, linked to non-Maya day signs and distinct conventions of depiction, hinting that the identities are hybrid—i.e., the objects draw on Maya imagery yet contrast with it by introducing non-Maya elements. Questions abound as to the identity of the personages in these images, the purposes for which they were gathered tête-à-têtes, and their appearance on pectorals or gorgets to be worn individually. Deeper still is the puzzle of how these scenes of identifiable, non-generic people found an audience over a large area. This talk collects known examples, examines their production and find spots, and details the conventions and visual content of the shells. In so doing, it probes the transcendent distribution of stories and novel identities in the Terminal Classic period.

Houston, Stephen [236] see Garrison, Thomas

Hovakimyan, Gohar [149] see Curtis, Caitlin

**Hovers, Erella (Hebrew University of Jerusalem) and Anna Belfer-Cohen**  
[212]

*Moving toward a Nuanced View of Symbols and Symbolic Culture*

Harold Dibble had strong views about the cognitive abilities and symbolic behavior of premodern humans as he gleaned them from the archaeological record through engravings, ornaments, burials, etc. After publishing a number of papers touching on these issues, mostly in the 1990s, Dibble rarely returned to address such questions in later years. The many changes in the pertinent archaeological record, as well as its underlying paradigms, with new insights from the fields of paleogenetics, new discoveries in the field, modeling of human

social behavior (among others), justify explicit rethinking. Taking stock of the current state of knowledge, we endeavor here to present an overview of the empirical database and of prevailing perceptions about the evolution of human symbolic capacities during the Middle and Late Pleistocene.

**Howard, Ted**

[144]

*Discussant*

**Howe, Mark (International Boundary and Water Commission, United States Section)**

[16]

*Falcon Dam and the Archaeological Landscape Today*

Falcon dam and reservoir near Zapata, Texas, was completed in 1954 as a binational project for flood control of the Rio Grande by Mexico and the United States. Some archaeological projects were completed before the area was flooded, cemeteries were exhumed and moved to new areas outside of the high flood waters, and whole towns were uprooted and relocated. Over the last 70 years since the start of the project, many older sites have now been uncovered and are being exposed. Remnants of the old towns on both sides of the border show how drought has now exposed them and newly exposed sites, changing the landscape from what was to what is today. The last time the water was this low was in the 1990s. I will demonstrate that this area is a dynamic landscape due to new exposure of sites and how humans respond to nature. This response for downstream protections called for dams to control the river and the consequences we are seeing today are yearly landscape changes and what we can do to help mitigate if not protect it.

**Howell, Mark (Winterville Mounds-Mississippi Department of Archives and History) and Igor Sarmientos (Proyecto Comuch)**

[34]

*Music Instruments in the Chajul Murals*

In this discussion the locations of murals in the three houses restored at Chajul are pinpointed, and the placement of musicians and instruments in those murals identified. The authors introduce music archaeology, and explain why its methods are necessary for identification and interpretive purposes; setting up a focus on the three instrument types shown, and describing their classification according to the Hornbostel and Sachs music instrument typology as membranophones (skin-drums), aerophones (wind instruments), and chordophones (string instruments). The European and/or Mayan origins and histories for these types are discussed, drawing on archaeological and pictorial evidence before attention is turned to the individual instruments shown. Next is presented the Highland Guatemalan Maya Instrument Dance-Play Classification System, a locale specific interpretive method that has been used in the past to understand the roles of soundmakers in regard to Highland Guatemalan Maya dance-plays (*bailes*) and other social acts. The authors also examine certain enigmatic objects in the Chajul Murals for clues as to their possible soundmaking function(s). Attention is ultimately turned toward a holistic examination of what the musical components can tell us about the dating of the paintings, and how music-related depictions can help us decipher the other subject matter shown.

Howell, Mark [34] see Banach, Monika

**Howland, Matthew (UGA Laboratory of Archaeology)**

[63]

*Modeling the Impact of Anthropogenic Sea-Level Rise and Storm Surge on Coastal Archaeological Sites*

This paper analyzes the impact of projected sea-level rise as a result of anthropogenic climate change on coastal archaeological sites in the state of Georgia. Coastal sites and environments are at increasing risk of erosion, inundation, and submersion due to projected sea level rise of 0.25–0.30 m by 2050 and up to 2.1 m by 2100, along with higher rates of coastal flooding events (NOAA 2022). Modeling the impacts of these climate changes

requires the use of many geospatial datasets, including those related to geomorphology, land use and cover, and operationalization of flooding and storm surge projections according to local conditions. This paper describes the development of a custom GIS model to predict the impact of these changes on coastal archaeological sites from the Georgia Archaeological Site File in order to provide a sophisticated prediction of how the archaeological record will be impacted by future sea level rise and storm-based damage.

**Hoyt, Delia (Hamilton College), Hannah Lau (Colgate University), Lacey Carpenter (Hamilton College) and Colin Quinn (Hamilton College)**

[122]

*Subsistence and Space within an Historical Central New York Household*

Food is a foundational element of people's everyday lives. The remains of what people did and did not eat can provide data as to how people lived, both within a household and as a society. This is true for historical assemblages, where physical remains can provide a more concrete picture of past lifeways than historical records alone. This poster investigates the faunal remains retrieved from the Barnabas Pond house in Clinton, New York. This house, initially completed in 1804 was the home of a Revolutionary War veteran and founder of the village of Clinton. We examined zooarchaeological from several extramural areas to reconstruct the past subsistence practices of this historical household. In particular, we focus on their diet and how the occupants accessed and utilized resources. Through the foodways present at the Barnabas Pond house, we will gain a greater understanding of subsistence practices in historical central New York.

**Hrncir, Vaclav (Max Planck Institute for Evolutionary Anthropology)**

[66]

*The Wooden Club: The Oldest Weapon or Myth?*

There is a popular idea that archaic humans commonly used wooden clubs as their weapons. This is not based on archaeological finds, which are minimal from the Pleistocene, but rather on a few ethnographic analogies and the association of this weapon with simple technology. This paper presents the first quantitative cross-cultural analysis of the use of wooden clubs for hunting and violence among foragers. Using a sample of 57 recent hunting-gathering societies from the Standard Cross-Cultural Sample, it is shown that the majority of them used clubs for violence (86%) and/or hunting (74%). Whereas in hunting and fishing the club usually served only as a secondary tool, 33% of societies used the club as one of their main fighting weapons. Based on these results and other evidence, it is argued that the use of clubs by early humans was highly probable, at least in the simplest form of a crude stick. The great variation in the forms and use of clubs among recent hunter-gatherers, however, indicates that this is not a standardized weapon, and that similar variation may have existed in the past.

**Hronec, Laura**

[193]

*Discussant*

**Hruby, Zachary (Northern Kentucky University)**

[83]

*Discussant*

**Hruschka, Daniel (Arizona State University), Robert Bischoff (Arizona State University) and Matt Peeples (Arizona State University)**

[95]

*ArchaMap: A Solution for Merging and Finding Archaeological Data*

Many of archaeology's biggest questions require the aggregation of numerous datasets. Often the main

stumbling block is the time-consuming matching of different categories and domain-specific ontologies between datasets. Even when this complex challenge is completed, there is rarely a record of how the datasets were merged (i.e., translated). Push for open access has increased the availability of online datasets such that it is a growing challenge to find where the data is stored. In North America, data could be located on tDAR, Open Context, Zenodo, Github, Open Science Framework, or custom solutions like CyberSW or the Chaco Research Archive. ArchaMap is a database and application that assists users in merging complex datasets. When datasets are merged, the translation of categories is stored for reuse based on open science principles. ArchaMap does not store any archaeological data other than category names and contextual information. Using ArchaMap's explore function, users can locate desired categories (e.g., for sites, pottery and projectile point types) and identify datasets that contain these categories. The merge function allows users to identify previously translated datasets and obtain the necessary information to easily locate and combine these datasets for reuse.

Hruschka, Daniel [73] see Peeples, Matt

**Hsieh, Ellen (National Tsing Hua University)**

**[10]**

*The Religious Network in the Early Spanish Colonialism in Asia: A Comparative Study of Seventeenth-Century Church Sites in Archaeological Contexts*

Evangelization of China and Japan was one of the missions of Spanish colonial projects in Asia, and churches, as critical monuments in colonial landscapes, could be an access to investigate European colonial activities. However, unlike the rich studies of missionary archaeology in the Americas, although some church sites have been excavated or documented in recent years in Asia, their meanings and connections in local and regional contexts have not been explored. Based on network theory, the present project compares several seventeenth-century church sites, including Santo Domingo Church site (Nagasaki, Japan), Todos los Santos Church site (Keelung, Taiwan), Iglesia de San Michael Arcangel ruin (Nassiping, Philippines), and Saint Raymond of Peñafort Parish Church (Rizal, Philippines), in order to investigate the development of the religious network, especially those of the Dominicans, in early Spanish colonialism. The focus includes the colonial contexts of the sites, construction materials, building techniques, designs, orientations, and associated archaeological findings. Through these architectural remains, the persistence and flexibility of the missionary agenda are partially revealed.

**Huang, Cindy Hsin-yee (Arizona State University), John Murray (Arizona State University), Sydney James (Arizona State University), Nicolas Hansen (Arizona State University) and Jonathan Paige (Arizona State University)**

**[41]**

*Quality Control: The Impact of Raw Material Quality on Inter-analyst Variation and Interpretation of Lithic Assemblages*

The issue of inter-analyst variation is common across nearly all archaeological artifacts. Within lithic analysis, there are many quantitative and qualitative assessments that could vary among analysts, which can cause problems in interpretation of stone tool assemblages. In addition, the effects of raw material on inter-analyst variation is not entirely understood; are analysts less consistent when measuring artifacts knapped from cores with many inclusions, for instance? In this study, we quantify the inter-analyst variation that exists when measuring experimentally produced flakes of different raw material qualities. Two expert and two novice knappers are asked to produce flakes from nodules of high, medium, and low-quality flint. Raw material quality is measured via surface roughness, hardness, and the presence of inclusions. Five lithic analysts will conduct blind analysis tests on this experimental assemblage. Variation between analysts and the impact of raw material quality on variation will be assessed. Our results will help us further understand the impacts of raw material quality on lithic analysis and how multiple observers introduce variation in stone tool studies.

Hublin, Jean-Jacques [206] see Talamo, Sahra

**Huckell, Bruce (University of New Mexico), Nadine Navarro (University of New Mexico), Christopher Merriman (Fort Lewis College), Joseph Birkmann (University of New Mexico) and Steven Shackley (Geoarchaeological X-Ray Fluorescence Spectrometry)**

[41]

*Blue Canyon, a Clovis Quarry/Workshop and Camp in Central New Mexico*

Opportunities to learn more about Clovis technological behavior at lithic material procurement and workshop sites are rare, particularly in the Southwest. The Blue Canyon site is a rare example of such a site—an artifact scatter covering some 16,000 m<sup>2</sup> and consisting of Clovis projectile points and preforms, end scrapers, bifaces, and lithic debitage located on BLM land southwest of Socorro, New Mexico. Remarkably, the site contains only Clovis diagnostics. Testing has revealed that the scatter is exposed on and slightly buried within an alluvial fan situated at the base of the Black Canyon quarry, a source of hydrothermally altered rhyolite commonly known as Socorro Jasper, which comprises over 95% of the artifact assemblage. The most abundant nonlocal material is obsidian, occurring in the form of small debitage and cores, which has been geochemically characterized and sheds light on Clovis lithic procurement strategy as well as procurement range. This artifact assemblage suggests that both tool manufacture and replacement, as well as domestic tasks, occurred here. Current research is focused on chemically characterizing the Black Canyon material to better document Clovis procurement and transport of this material use in New Mexico.

Huckell, Bruce [179] see Chapman, Larkin

Huckell, Bruce [20] see Swarts, Kelly

Huckell, Lisa [20] see Swarts, Kelly

**Huerta, Danielle (University of California, Santa Cruz)**

[215]

*Glittering and Glassy: Understanding the Intersection of Colonial Mineral Extractivism and the Production of Late Rio Grande Lead Glaze-Painted Pottery at Paa-ko Pueblo*

Paa-ko Pueblo, also known as the mission of San Pedro due to its colonial period component, is one of the better studied sites in the East Mountain region. However, the research presented here represents the first systematic look at late Rio Grande Glaze Ware (RGGW) pottery excavated from the site's colonial context(s). While little is known about the site's seventeenth-century occupants, evidence of a copper/lead smelting facility along with the presence of an abundance of late RGGW lead glazed pottery help to position the site at the unique intersection of preindustrial colonial extractivism and the traditional ecological knowledge (TEK) of Pueblo mineral and pottery specialists. By utilizing lead isotope sourcing and chemical characterization of lead glaze paints, ceramic petrography, and variation(s) in glaze paint appearance, along with basic attribute analysis of pottery pastes, slips, and decoration, this research hopes to (1) reveal insights into networks of trade and production that Paa-ko was embedded in and (2) contribute to understanding the role that Pueblo TEK of lead ore and its sources and glaze paint pigmentation strategies may have played in the production of late Rio Grande Glaze Ware pottery and the maintenance or transformation of Pueblo worldviews during the seventeenth century.

Huerta, Danielle [224] see Linford, Samantha

Huet, Liliana [226] see Manni, Franz

Huffman, Frank [170] see Kappelman, John

Hufthammer, Anne Karin [63] see Van Den Hurk, Youri

Hughes, Karissa [118] see Buckser, Sasha  
Hughes, Karissa [100] see Singleton, Robin

Hughes, Tyson [90] see Jones, Jeffrey

Huisman, Hans [159] see Dusseldorp, Gerrit

Hull, Bryna [214] see McNeill, Patricia

**Hulse, Eva (Archaeological Investigations Northwest)**  
**[37]**  
*Chair*

**Hulse, Eva (Archaeological Investigations Northwest), Jason Cowan (Archaeological Investigations Northwest) and Kristen Heasley (Archaeological Investigations Northwest)**  
**[37]**

*Dating the Oldest Sites in the Portland Basin*

In the Portland Basin in Oregon, organic material is rarely preserved, archaeological features are often thoroughly bioturbated, and historic wildfires have introduced abundant charcoal into the soil matrix that is not directly tied to human settlement. Dates must often be estimated without the aid of radiocarbon analysis. This presentation reviews dating methods that have been applied to some of the oldest sites in the Portland basin, such as the Burnett Site. The methods used include optically stimulated luminescence and obsidian hydration rind analysis and reveal not just chronology but also environmental history and long-distance trade networks.

Hunn, Eugene [185] see McClure, Richard

Hunt, Garrett [219] see Cooper, H. Kory

Hunt, Terry [207] see Rieth, Timothy

Hunt, Turner [74] see Holland-Lulewicz, Jacob

Huntley, Deborah [176] see Ferguson, Jeffrey

Hurst, Heather [125] see Griffin, Robert

**Hurst, Stance (Museum of Texas Tech University), Doug Cunningham (Museum of Texas Tech University), Eileen Johnson (Museum of Texas Tech University), Glenn Fernández-Céspedes (Museum of Texas Tech University) and Markus Crawford (Museum of Texas Tech University)**  
**[239]**

*A Look at the Impact of Natural Grassland Fires on the Archaeological Record along the Eastern Escarpment of the Southern High Plains of Texas*

Fires are an essential aspect of the grassland ecosystem across the Great Plains. Natural fires often can transform surrounding rocks to look like hearths or individual hearthstones used by prehistoric people.

Several experiments, however, have demonstrated that grassland fires may not fully discolor the rocks on all sides compared to what occurs in a cultural hearth feature. In the spring of 2008, a grassland fire swept through part of a historic ranch located along the eastern escarpment of the Southern High Plains of Texas. This fire created surface features that mimicked the appearance of hearths. This mimicry occurred in areas where a mesquite or juniper tree also burned, which created a higher sustained temperature and altered the local gravel rock more thoroughly. To further investigate the impacts of natural fires, 15 wildfire features resembling hearths were documented, and one was excavated. This research demonstrates that fires can create features resembling hearths on the surface. Excavation, however, demonstrated that a naturally produced thermal feature will contain larger pieces of charcoal (>5 cm) and will not have the same basin morphology typically found in cultural hearths. This study demonstrates the importance of investigating fire's natural impacts on the archaeological record.

**Hurt, John Duncan (University of Texas, Austin)**

**[250]**

*Understanding the Organization of Built Space Using Spatial Statistics in GIS*

Archaeologists who study the hillforts of Northwest Iberia have often used the layouts of individual settlements as the basis for inference and speculation on a wide range of phenomena, largely toward the end of establishing some understanding of the "social structure" of Iron Age communities. This often amounts, however, to little more than informal visual inspection of illustrated plan maps. In order to meaningfully interpret the spatial properties of the internal organization of a settlement, it is necessary for researchers to clearly define those properties and to develop methods that are capable of measuring and describing them, if not quantitatively then at least as systematically as possible with reference to some explicit set of criteria. The methodological toolkit of Space Syntax presents itself as a candidate for these purposes, and its potential for use in archaeological contexts has been steadily explored ever since its conception in the 1980s. Space Syntax must be heavily modified to make it compatible with archaeological applications, however, due to the incomplete nature of archaeological evidence and the limitations of the framework itself. Toward that end, I propose a new set of GIS-based tools and procedures for the systematic description of spatial properties in archaeological settlements.

**Huster, Angela (PaleoWest), Marion Forest (PaleoWest), Sebastian Chamorro (PaleoWest) and Amber Treadway (PaleoWest)**

**[201]**

*Hohokam Settlement and Agriculture along the New River*

This poster presents the results of three recent PaleoWest data recovery projects at small habitation sites and agricultural areas surrounding AZ T:7:68(ASM)/Palo Verde Ruin, one of the primary northern-periphery Hohokam sites along the New River. Previous work at the Palo Verde site had demonstrated a pattern of multiple small sites during the Colonial and early Sedentary period, consolidation into a single large settlement during the Middle Sedentary period, and abandonment of the site during the Late Sedentary period. The current work at sites in the surrounding area has confirmed this general pattern, adding to our understanding of the scale, specialization, and timing of Hohokam settlement along the northern Phoenix periphery.

**Hutson, Scott (University of Kentucky)**

**[17]**

*Discussant*

**[83]**

*Moderator*

**Hutson, Scott (University of Kentucky), Bruno Athie Teruel (University of Kentucky), Rodolfo Canto Carrillo (University of Kentucky) and Jaycee Castro (University of Kentucky)**

**[131]**

*The Impact of Gendered Mentorship in the Leak between Dissertation Programs and Tenure-Track Jobs*

The leaky pipeline for women in archaeology has been documented in a number of contexts. This paper begins by measuring the size of the leak in the pipeline from PhD programs to tenure-track positions in US anthropology departments. As an attempt to move toward explaining why gender inequalities persist, we then explore the degree to which the apparent gender of dissertation thesis advisors and committee members correlates with job placement. We determine whether women who landed jobs in academia have more women in these mentorship positions than those who completed dissertations but did not acquire academic jobs.

**Hvidberg, Madisen (University of Calgary) and Peter Dawson (University of Calgary)**

[192]

*Digital Approaches for Dissonant Heritage, Examples from Alberta*

The term dissonant heritage addresses the conflicting nature of heritage when different groups or individuals attribute contested meanings to the past. Often these sites have dark histories and are associated with death, trauma, or suffering and conflict arises from a contestation over whose perspectives and experiences surrounding a heritage are most valid. Cultural heritage is often seen as a world resource, but in giving a specific meaning to the past and what aspects are valued or not this inherently legitimizes at least one perspective over others and through the legitimization of one past over the other, heritage becomes a tool for maintaining, creating, or establishing specific social orders. Using examples of heritage sites from Alberta, Canada that have been digitally documented using reality capture technologies, this paper discusses benefits of digital approaches for the preservation, management, and interpretation of dissonant heritage sites.

**Hyde, David (Western Colorado University)**

[99]

*Bits and Pieces: A Contextual Analysis of Portable Material Culture from the Medicinal Trail Community, Belize*

This poster details the findings of a contextual analysis of portable material culture, commonly referred to as “small finds” artifacts, collected from 2004 to 2019 at the hinterland Maya community of Medicinal Trail, located in northwestern Belize. The collection from Medicinal Trail comes from a variety of contexts, such as middens, burials, caches, and fill. It includes artifacts from several nonperishable raw materials including clay, shell, coral, and stone. Numerous technological systems of production are represented. Metric and attribute descriptions are provided; however, an emphasis is placed on their theorized function and contextual location. A detailed look at these artifacts provides a glimpse into the activities that were taking place at the Medicinal Trail site.

Hyde, David [99] see Godhardt, Ava

**Hyland, Corrie (University of Oxford)**

[53]

*Chair*

**Hyland, Corrie (University of Oxford), Rick Schulting (University of Oxford), Amy Styring (University of Oxford) and Andrzej Weber (University of Alberta)**

[53]

*Radiocarbon Dates and Freshwater Resource Use within Prehistoric Diets*

The human remains of Early to Late Neolithic and Early Bronze Age populations surrounding Lake Baikal have known and large offsets in their radiocarbon ages caused by “old carbon” in freshwater ecosystems. This freshwater reservoir effect (FRE) causes human radiocarbon ages to appear older based on the amount of old carbon each individual consumed through the freshwater component of their diet. Human archaeological radiocarbon dates at Baikal have been corrected using equations based on bulk stable carbon and nitrogen isotope values as indicators of past freshwater food consumption, but these corrections produce large error ranges. This research tested carbon compound-specific carbon isotope analysis on amino acids and bulk

stable sulfur and hydrogen isotope analysis as alternative isotope systems to distinguish the freshwater component of past human diets, thus improving the precision for dating of key transitions in these hunter-fisher-gatherer populations. Additionally, this research tested the utility of compound specific carbon isotope indicators of freshwater resource consumption in a region where the baseline freshwater resources had complex and wide-ranging bulk stable carbon isotope values. An additional pilot study of both modern and archaeological fish samples provides insight into the mechanisms driving past and modern FRE for rivers surrounding Lake Baikal.

Iancu, Liviu [82] see Rabinowitz, Adam

**Iannone, Gyles (Trent University)**

[158]

*Discussant*

**Iannone, Gyles (Trent University)**

[109]

*The Current State of Settlement Archaeology in the Study of Southeast Asia's Preindustrial State Formations: The Critical Appraisal of a Scholarly Interloper*

An overview of the extensive use of settlement archaeology in Maya studies provides an entry point for a critical consideration of the comparatively limited role that this method has played in the study of the preindustrial states of Southeast Asia, especially when it comes to investigating the habitation sites of the commoner segment of the population. It is argued that the perpetual underdevelopment of settlement archaeology—and specifically the failure to generate comprehensive, empirical datasets representing the diverse support populations of these early state formations—means that our interpretations continue to be biased toward the upper echelons of society. Although recent macroscale remote sensing programs and sophisticated computer analyses have generated relevant insights concerning the significance of the ground plans of urban centers and their immediate surroundings, these coarse-grained studies have also unintentionally drawn scholarly interest even further away from the much-needed microscale excavation of suburban, peri-urban, and rural occupation loci. Representing the largest and most diverse segment of the population, such sites contain the precise types of fine-grained data that are needed to generate a bottom-up perspective on daily life in the ancient societies we are so captivated by.

Iannone, Gyles [109] see Macrae, Scott

**Ibarra López, Miguel (Centro INAH Michoacán), Marcela Lázaro Tovar (Universidad Michoacana), Alfonso Gastelum-Strozzi (ICAT UNAM) and José Luis Punzo Díaz (Centro INAH Michoacán)**

[200]

*Fire and Death in the Great Platform of Tzintzuntzan, Mexico*

Just as fire and firewood were considered very important elements in the cosmovision of the Tarascan culture, so were war and sacrificial practices. Prisoners of war were sacrificed to two types of deities, the first linked to the celestial bodies and the second linked to the earth and water. Historical sources mention that these sacrifices and their subsequent treatment were carried out in different places within the Great Platform of Tzintzuntzan such as the Yácatas, the so-called grasslands and Edificio B, which also has archaeological evidence; as for the different postmortem treatments, we have the cremation, boiling, and fleshing of the skeletal remains. Using macroscopic studies and from a taphonomic perspective and using different optical techniques, a sample that is part of the skeletal bone remains recovered during the 2022 season was analyzed. This poster seeks to corroborate the existence of treatment sites prior to final deposition in the ossuary and the link between fire and his postmortem practices.

Ibarra López, Miguel [200] see Pelaez-Ballestas, Ingris

**Ibarrola, Mary Elizabeth (University of Texas, Austin) and Lori Lee (Flagler College)**  
[225]

*Autonomous Landscapes at Fort Mose*

Fort Mose was the first legally sanctioned free Black community in North America. While the direct result of petitions by self-liberated Africans seeking formal emancipation, the policy that generated the settlement reflected political, military, and religious concerns of the Spanish as well. The governor of Florida guaranteed the legal freedom of self-emancipated Africans in 1693 only if they converted to Catholicism, occupied a fort on the frontier of St. Augustine, and fought against Spanish enemies. These contingencies are embodied in the built environment of Fort Mose and in the materiality of daily practices there. While historical and archaeological attention has highlighted the opportunities and challenges of military service for Afro-descendant peoples, the role of religion has been under-examined. This paper explores the intersection of religion and autonomy in the colonial landscape at Fort Mose through analysis of settlement patterns, movements, use of space, and archaeological evidence. While the alliance between the formerly enslaved individuals and the Spanish government might typically preclude use of the term “maroon” to describe the community, an understanding of ritual autonomy and spiritual practice reminds us that the militia at Fort Mose was constantly negotiating the line between freedom and bondage and continually reasserting their independence.

**Ichikawa, Akira (Kanazawa University) and Arthur Joyce (University of Colorado, Boulder)**  
[91]

*Late Classic and Early Postclassic Residential Spaces of Rio Viejo, Oaxaca: Preliminary Results*

The Río Verde Project-2022 examined changes in domestic economy at the city of Río Viejo during the Classic to Postclassic transition. Horizontal excavations were carried out in two low status residential areas. In both areas excavations moved from Early Postclassic domestic space near the surface into Late Classic residential areas in deeper levels, although one of the excavation areas was the focus of supra-household activities at the end of the Late Classic. Excavations explored four Late Classic residences and eight Early Postclassic ones. Evidence for the preparation of meals was found in the form of three earth ovens, which based on their size may have involved supra-household groups in the Late Classic perhaps associated with ritual feasting. Inhabitants ritually marked the dramatic social changes that occurred in the broader region during the Classic–Postclassic transition through termination ceremonies involving the intentional breakage of ceramic vessels and incensarios. Evidence for domestic activities was recovered from two large middens. A total of 23 burials were exposed. The most elaborate burial was that of an adult female dating to the Classic–Postclassic transition. She was accompanied by implements used in the spinning and weaving of cotton as well as elaborately decorated ceramic vessels.

Ichikawa, Akira [102] see Aguayo Ortiz, Elaine

Ichikawa, Akira [127] see Perry, Gabrielle

**Iglesias, Christina (California State University, Los Angeles)**  
[81]

*Chair*

**Iglesias, Christina (California State University, Los Angeles), James Brady (California State University, Los Angeles) and Guillermo de Anda (Gran Acuífero Maya/INAH)**

[81]

*A Season after COVID: Investigating Las Monjas Sascabera 2*

In June 2022, the Gran Acuífero Maya resumed investigations initiated in 2018 of Las Monjas Sascabera 2 (LMS2), one of 11 sascaberas located south and west of the Las Monjas complex at Chichen Itza. In the intervening years, rain washed out accumulated soil that had blocked access to the circular, constructed entrance and exposed several previously unexplored passages, thus increasing the size and complexity of the

feature. A surface survey recorded 376 ceramic sherds including a portion of an Early Classic jar, suggesting the chamber had a long use-life. Several artifacts were noted including a figurine that appears inconsistent with a mining function. Our results underscore the inefficiency of removing an enormous quantity of sascab through the small circular entrance. It appears inescapable that the Maya were prioritizing the creation of subterranean space over extractive efficiency.

Igreja, Marina [214] see Val, Aurore

**Ingalls, Teresa**

[120]

*Moderator*

**Ingalls, Victoria (Acacia Heritage Consulting) and Rachel Feit (Acacia Heritage Consulting)**

[239]

*Preliminary Data and Experimental Studies of Fire-Cracked Rock from Two Archaic Period Sites in North-Central Texas*  
Recent investigations at two campsites—41DN580 and 41DN624—along Hickory Creek in Denton County are providing insights into precontact period lifeways in Texas's Upper Trinity River basin. These sites contain deeply buried and stratified components spanning the Middle Archaic, from around 5800–2800 cal BP, making them among the very few well-preserved and excavated sites of this age in north-central Texas. Both sites are characterized by multiple discrete fire-cracked rock (FCR) features with limited associated artifacts. Three categories of FCR features were identified representing both formal and informal hearths, as well as earth ovens. Experimental studies were conducted to determine approximate heating temperatures and duration using alteration analyses focusing on color change, sooting, and fracture patterns of locally available rocks. Resulting patterns are described alongside feature-specific attributes to examine purpose, intersite variability, and possible diachronic changes in feature-type preference. This presentation will discuss the results of these investigations, preliminary analysis for both sites, and the implications for socioeconomic choices and strategies of Archaic period mobile hunter-gatherers of the Trinity River Basin.

**Ingram, Scott (Colorado College)**

[96]

*Understanding Past Human Securities, Sustainability, and Migration for a Climate-Changing World*

During the 1200s–1400s CE in the US Southwest and Mexican Northwest, tens of thousands of people were on the move—many leaving places where knowledge of landscapes had accrued at the scale of millennia. By the end of the 1400s, population levels had declined by about 50%. What conditions led to this migration and depopulation and what can we learn that will contribute to human adaptation to a climate-changing world? One contribution archaeology can make to the future is testing assumptions relied on by modern policies and using non-archaeological frameworks to investigate the past. Here we rely on the UN Development Programme's human security framework, an approach built on efforts to realize a world free from fear, want, and indignity by decreasing human insecurities (environmental, political, health, etc.). The results presented affirm the relationships that inspire and inform this framework and associated policies: as insecurities increased, migration increased, and the sustainability of places decreased. Identifying archaeologically informed insights from the past for the future expands the spatial and temporal scales of landscape learning beyond individual human experiences—it is a new form of landscape learning possible and enabled by archaeology in the twenty-first century.

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

[213]

*Ideological and Material Conditions Shaping the Nature of Warfare in Maya Society*

Recent investigations have revealed substantial evidence of fortifications and physical conflicts in the Maya lowlands. Nonetheless, warfare in Maya society never led to the development of stable conquest states or

empires. Factors affecting this process may have included the ideological and material conditions of this region. The ideology of political power, shaped through the historical processes of the region, focused more heavily on direct interaction and notions of mutual obligation between elites and subjects than institutionalized systems of bureaucracy. The environmental settings of the Maya lowlands limited the inhabitants' ability to transport and store materials, particularly foodstuffs, in large quantities. Although such conditions do not determine the course of social change, they presented significant hurdles for the development of conquest states or empires.

Inomata, Takeshi [54] see Character, Leila  
 Inomata, Takeshi [164] see Mendez Bauer, Maria Belen  
 Inomata, Takeshi [17] see Triadan, Daniela

Intxaurbe, Iñaki [28] see Chanteraud, Claire

Iovino, Maria Rosa [232] see Coskunsu, Güner

Ireland, Brenda [136] see Higgins, Howard

### **Iriarte, Jose**

**[19]**

*Circular Worlds: Comparison and Reflections on the Earthen Architecture of Lowland South American Circular Villages*  
 As a mentor, Tom Dillehay has formed and influenced me and archaeologists from the southern cone of South America on a variety of themes, including the peopling of America, plant domestication, and the arrival of monuments. In particular, Dillehay had a significant impact on how we think about the uses, function, and sociopolitical organization of Uruguay's mound settlements popularly known as "Cerritos de Indios." To celebrate his ongoing legacy, here I will present a review and reflections on the diversity of mounded architecture and sociopolitical organization of precolumbian circular villages across lowland South America beginning with the mid-Holocene circular mound villages of SE Uruguay, moving on to Central Brazil, the Upper Xingu, and concluding with the newly discovered circular mound villages of SW Amazonia in Acre state, Brazil.

Iriarte, Jose [20] see Maezumi, S. Yoshi

Israde-Alcántara, Isabel [13] see Domínguez-Vázquez, Gabriela

Ivanov, Sergey [141] see Chang, Claudia

### **Ives, Charlotte (Hamilton College), Colin Quinn (Hamilton College), Lacey Carpenter (Hamilton College) and Hannah Lau (Colgate University)**

**[44]**

*Identity through Ornamentation: An Iconographic Analysis of Nineteenth-Century Ceramic Tableware from Central New York*

The study of ceramics provides archaeologists with a closer look into the domestic life of people from the past. Whether it be daily wares designed for continuous use by close-knit familial groups, or ceremonial pieces used occasionally for specific audiences, ceramics play a critical role in the ritualization of meals. Despite their varying purposes, these vessels each work to signal aspects of their owner's social, political, or economic identity. Following the end of the Revolutionary War, an influx of European colonists settled in the

central New York region on the traditional lands of the Oneida. In 2021–2022, a collaborative team of archaeologists, seeking to better understand daily life at these homesteads, conducted geophysical surveys and excavated at two houses constructed between 1798 and 1804: the Barnabas Pond house and the Reuben Long house. Using the ceramics recovered from these sites, we investigate the use of ornamentation as an indication of social status. We explore the patterns and visual representations in this collection to trace fluctuations in the prominence of these styles over time. Through this data we are able to further our understanding of what these vessels conveyed about their owners, as well as those who dined at their table.

**Ives, John (University of Alberta)**

[89]

*Stemmed Points in the Ice-Free Corridor*

Much reasoning about the early occupation of the Ice Free Corridor has centered on the fluted point phenomenon. Fluting or basal thinning of lanceolate points can be readily recognized, and occurs in a relatively restricted time frame (~13,100 to ~11,500 calendar years ago). Fewer comparisons have been made with stemmed points from the Plateau and Great Basin, which have considerable morphological variability and a time range that extends from 14,000 or more years ago to as recently as ~8,000 years ago. A similar broad time range is true for Alaskan stemmed points. Virtually all stemmed point morphologies are also present in the Corridor. Earlier findings from Banff National Park in southwestern Alberta clarified that at least some of these stemmed points are ~11,500 cal yr BP of age. Here I assess morphological variability for stemmed points in the greater Corridor region, making specific reference to the Poohkay assemblage from northwestern Alberta's Peace River country, which strongly resembles the McNine cache from Nevada. The relative abundance of both fluted and stemmed points in the Corridor has significant implications for our understanding of rapidly evolving genetic inferences about early PaleoIndigenous populations as deglaciation proceeded.

Ives, John [248] see Gilmore, Kevin

Ivy, Donald [98] see Tveskov, Mark

Izuho, Masami [55] see Gillam, J. Christopher

Izzo, Victoria [134] see Mink, Kirsten

**Jablonski, Lauren (Oklahoma Public Archaeology Network)**

[106]

*Chair*

**Jablonski, Lauren (Oklahoma Public Archaeology Network)**

[106]

*The History of Archaeology: Looking to the Past to Unravel Sexual Harassment in the Present*

In archaeology, sexual harassment has become a defining part of our culture and affects many professionals across all subfields. This paper is a part of ongoing research that focuses on the history of archaeology as a way to understand sexual harassment in our culture, and to find ways to change this aspect of our culture moving forward. Our field, like many in academia, is centered on mentor/mentee relationships. These relationships not only facilitate the passing of professional skills on to the next generation of archaeologists but also allow mentors to personally acculturate mentees into the culture of archaeology. Our system of informal apprenticeship creates a chain of personal mentorship and personal acculturation that allows past archaeologists to continue participating in the culture of archaeology. This creates a present culture that still allows sexual harassment. To understand how to face the prevalence of sexual harassment in archaeology, we first have to understand how it became so deeply rooted in our culture. This paper explores the history of archaeology as a resource for present and future change.

Jackson, Paul [6] see Filoromo, Steve

**Jackson, Rowan, Andrew Dugmore (University of Edinburgh) and Felix Riede (Aarhus University)**

[96]

*Objects of Adaptation: The Role of Play Objects in Adaptation to Environmental Change in the North Atlantic Islands*  
We present a comparative analysis of Norse and Thule play objects and practices (i.e., toys and games) in the North Atlantic islands, focusing on their role in enculturation and information transmission between generations. When considered together with environmental records, this information offers insights into processes of cultural path-dependence and limits to adaptation. We explore key differences in the adaptive toolkits of Norse and Thule cultures, and their role in the contrasting fates of these cultures during the Little Ice Age. A limited but steady growth of publications has drawn attention to the formative years in Viking society, where toys delivered vital information for surviving in environment and society alike. This paper builds on the concept of landscape learning by situating the context of spatial and limitational knowledges in the social knowledge that is passed between generations as cultural adaptations. We consider toys as progenitors of cultural and environmental knowledges for the Norse and Thule cultures, and integral to how they made sense of their environments. By comparing the style and symbolism of these artifacts, and using historical and ethnographic analogies, it is possible to explore the growing divergence of adaptive strategies in the changing environments of the medieval North Atlantic.

**Jaffe, Yitzchak (University of Haifa), Andrew Womack (Furman University), Dayna Thomas (Furman University) and Anke Hein (Oxford University)**

[121]

*Publication Trends in Research on Human Environment Interactions in Early China*

Over the last two decades, there has been an increasing move toward the use of archaeometric analyses to gain deeper insights into past human realities. In China, this can be seen most prominently in the growing body of research on ancient human-environment interaction by both archaeologists and paleoclimatologists. While interdisciplinary work is crucial to reach a better understanding of the past, significant challenges remain in successfully combining knowledge and methods of different disciplines. This makes the factors shaping this research trend in both fields an important matter to investigate. Using publication data available via the Web of Science database, we found that most of these publications appear in journals with an earth and planetary science focus as well as multidisciplinary venues rather than specifically archaeological or anthropological periodicals. In this contribution we consider what shaped these publication trends, such as journal rankings both within and outside China, a desire to showcase the scientific aspects of these projects, as well as a desire to engage with distinct academic circles.

**Jaillet-Wentling, Angela (PA DCNR)**

[18]

*Chair*

[187]

*Discussant*

**Jaillet-Wentling, Angela (PA DCNR) and Katherine Peresolak (Student Conservation Association)**

[18]

*Tackling Hard Histories in Penn's Woods: Exploratory Archaeology of Two Segregated CCC Camps*

A number of recent initiatives including the development of a Cultural Resources Program, Untold Stories interpretative work, and programming like Penn's Parks for All at Pennsylvania's Department of Conservation and Natural Resources (DCNR) had the cumulative effect of providing multiple opportunities for the agency to undertake telling the hard histories of Penn's woods. In partnership with the Student Conservation Association, DCNR's Pennsylvania Outdoor Corps created the Cultural Resources Crew to undertake

inventory, compliance, and research projects. Tackling our hard histories is a central focus of the new CR program and its crew's research, as it involves those stories left unsaid or untold due to limited traditional sources or a general unwillingness to talk about subjects like segregation and underrepresentation of various populations on public lands. In 2022, the crew's archaeological investigations focused on mapping and metal detecting two segregated Civilian Conservation Corps (CCC) camps (Companies 361-C and 2312-C) at Penn-Roosevelt and Pymatuning State Parks. The archaeology and interpretation of these sites helps to uncover the experiences and tell the stories of the young Black men living in the camps planting the industrially ravaged landscape and building a parks and forests infrastructure system in use today.

**Jaimes Betancourt, Carla (University of Bonn)**

[59]

*Surviving Traditions: Pottery with Freshwater Tree Sponge Spicules (Cauixi) in the Great Tectonic Lakes of Exaltation of the Llanos de Moxos, Bolivia*

The ethnic and linguistic diversity of the southwestern Amazon is one of the greatest in the world. This diversity is reflected in settlement patterns, types of monuments, spatial planning and use, cultivation techniques, and also in ceramic production. From AD 400 to the present, numerous ethnic groups of the Llanos de Moxos have produced a great variety of ceramic artifacts in which diverse pottery traditions have prevailed, changed, or innovated over time. This paper will present archaeological and ethnographic studies on the elaboration of ceramics with spicules of freshwater tree sponge (*cauixi*) in the Great Tectonic Lakes of Exaltation of Los Llanos de Moxos, Beni, Bolivia.

**Jakowchuk, Venice**

[154]

*Comparative Stylistic Analysis of Calixtlahuaca Projectile Points*

This paper discusses a comparative stylistic analysis of projectile points from the Postclassic (AD 1130–1530) Aztec city of Calixtlahuaca, located in the Toluca Valley of Central Mexico. Chemical sourcing of Calixtlahuacan obsidian has illustrated that the site was primarily supplied with obsidian from both West and Central Mexico. However, evidence shows that as the amount of central Mexican obsidian increased, the amount from West Mexico decreased. This comparative research will focus on comparing the style of points from Calixtlahuaca to styles from West and Central Mexican sites. Although it has been argued that functional classifications are problematic because the archaeologist is only seeing the final form of a projectile point, they are still useful for making inferences that can be tested. The main questions addressed are (1) do the styles represented at Calixtlahuaca reflect ties with both areas, (2) whether there is any evidence that the Calixtlahuacans were reusing points that are stylistically associated with earlier periods? This latter question is important because only about half the amount of obsidian was reaching Calixtlahuaca by the time of the Spanish conquest. This suggests a scarcity of obsidian, which might have resulted in the curation of earlier projectile points.

Jalandoni, Andrea [49] see Peterson, John

Jalbert, Catherine [65] see Ross, Jamie

Jambrina-Enríquez, Margarita [240] see Mallol, Carolina

James, Riley [183] see Powis, Terry

**James, Steven (California State University, Fullerton)****[241]***Hawaiian Petroglyphs and Pictographs: Patterns and Interpretations from Hawai'i, Maui, Moloka'i, O'ahu, and Kaua'i*

The Hawaiian Islands have a variety of rock art sites I have examined and photographed on five of the eight main islands over the past 50 years, with most of the research conducted more recently as summarized in this presentation. Some islands have only a few petroglyph locations, whereas the Big Island (Hawai'i) has the most with over 70 sites. In general, pictographs are relatively rare. Hawaiian anthropomorphic motifs include stick-figures that evolved into triangular-bodied elements followed by triangular figures depicted with muscles. Other petroglyph elements include dogs, outrigger canoe sails, and based on ethnographical and ethnohistorical sources, cupules used to place umbilical cords (*piko*) of newborn infants. Historical motifs depict rifles, sailing vessels, horses, and other introduced material culture, as well as alphabetical lettering taught to Native Hawaiians by missionaries. Although some rock art sites are protected by local and state agencies, many have been vandalized, and others destroyed by development of resorts and/or increased tourism, including showing rock art photos and site locations on internet blogs. For coastal sites, another emerging threat involves rising sea levels due to climate change, and some rock art sites have already been submerged due to subsidence from geological processes.

**James, Sydney (Arizona State University), Husna Mashaka (University of Nairobi), Sarah Mollel, Julius Ogutu (Universidad Complutense de Madrid) and Kathryn Ranhorn (Institute of Human Origins, SHESC, Arizona State University)****[2]***GIS-Based Approaches to Obsidian Studies in Eastern Africa*

Studies of obsidian transport during the Late Pleistocene of eastern Africa have been largely productive for reconstructing raw material procurement patterns and movement across landscapes. Due to a limited sample, however, these studies are often descriptive of particular sites and related explicitly to material provenance and transport distance, and little is known about the factors influencing procurement decisions. Archaeological and experimental studies from other contexts indicate that obsidians may have been preferentially selected for quality and/or symbolic properties. To study these relationships, quantitative geospatial methods have become common practice in other regions of the world but have yet to be fully utilized in eastern Africa. Using quantitative geospatial methods in conjunction with obsidian provenance data in later Middle and Late Pleistocene archaeological sites, we seek to answer questions such as the following: how do least-cost pathway distances generated in a GIS compare to commonly used straight-line distances? Preliminary results suggest some archaeological occurrences of obsidian movement over 50 km cannot be explained by proximity to source alone. The methods and results presented here are needed to build testable models to study obsidian selection preferences and landscape use in Late Pleistocene *Homo sapiens* populations.

James, Sydney [41] see Huang, Cindy Hsin-yee

Jampolsky, Marlene [155] see Krier, Jon

**Janes, Stephen****[127]***The Discovery of California Megalithic Structures: The Geology and Geomorphology of the Artificial*

The recent discovery of megalithic structures on the central coast of California was accomplished by geologic analysis of mounds and stone piles on the crest of Tomales Point in the Point Reyes National Seashore. These features were generally ignored by both geologists and archaeologists because at a distance they look like bedrock outcrops. However, the presence of two stone lines in the area suggested that prehistoric builders were active there. To test this hypothesis an analysis of the geomorphology surrounding the lines was conducted. Geomorphology indicates that this location on Tomales Point is unique to the region and supports the hypothesis. A detailed geologic examination of select mounds further supported the idea and revealed

evidence of previous construction activity. Confirmation of the presence of early visitors to the site was provided by the discovery of a circular cut into bedrock that appears to be a former roundhouse foundation.

**Jankovic, Ivor (Institute for Anthropological Research, Zagreb, Croatia), Darko Komšo (Archaeological Museum of Istria), Siniša Radovic (Croatian Academy of Sciences and Arts), James Ahern (University of Wyoming) and Rory Becker (Eastern Oregon University)**  
[47]

*Recent Insights and Research on Paleolithic of Istria: Examples from Romuald's Cave*

The recent decade saw a rapid rise in the research on Paleolithic sites in Istria. This renewed interest started with field surveys and continued with new research projects aimed at better understanding of biocultural patterns and adaptations of hunter-gatherers in the region during the Pleistocene. The research included new fieldwork at several sites, as well as analytical work on previously available samples. One of the sites where new excavations were conducted is Romuald's cave, situated in the Lim Channel in Istria. The cave was previously known as a prehistoric site, yielding material from the Iron and Bronze Age, as well as from the Upper Paleolithic. Our interdisciplinary work at the site resulted in new datasets (including analyses of anthropological and lithic material, new radiometric dates, sediment DNA, and geoarchaeological and geophysical work). Of particular interest is that the site was used both by Neanderthals during the Middle Paleolithic, as well as anatomically modern humans during the Upper Paleolithic. The latter were also responsible for the cave paintings, the first documented such case in the region. Research at Romuald's cave was supported by Croatian Science Foundation (grants no. UIP-11-2013-7789 and IP-2019-04-7821).

Jankovic, Ivor [47] see Ahern, James

Jankovic, Ivor [47] see Becker, Rory

**Jansen, Amelia (University of Alaska)**  
[122]

*Zooarchaeological Analysis of Alaskan Gold Rush Sites*

The current accumulation of archaeological investigations at far-north Alaskan Gold Rush sites either completely lack or severely underrepresent the zooarchaeological components at these sites. This data is vital and adds context to past and future archaeological investigations by enabling more accurate and inclusive interpretations of life in the mining-related settlements of the far north. This research is an analysis of previously unidentified and partially identified faunal assemblages from Gold Rush-era archaeological sites in interior Alaska. These sites include Coldfoot, Barnette Street (Fairbanks), Tofty, Wiseman, Eagle, and Uhler Creek Cabin. I use the data I generate from the analyses of these diverse sites and site types to determine how animals were being utilized by the residents of differing mining-related settlements. By comparing sites of different sizes and purposes I identify how domesticated and wild animals were differentially utilized in various places and circumstances. This complements analyses previously completed on trade goods at these historical sites while informing upon localized (wild) resource use. A formal study of these dynamics has not been completed leaving a large gap in our understanding of human-environmental interaction in far north mining-related settlements.

Jansen, Joana [185] see McClure, Richard

Jansson, Anna [150] see Snitker, Grant

**Janz, Lisa (University of Toronto)**  
[244]

*Identifying Animal Management Strategies in Pre-domestication Contexts*

The concept of domestication highlights a form of human intervention in animal reproduction that is at the extreme in a continuum of human-animal relations. Despite the extreme nature of this category of

interaction, domestication remains difficult to distinguish archaeologically and biologically. Moreover, there is increasing reason to believe that pre-domestication forms of management would have preceded biologically and archaeologically recognizable forms of domestication by hundreds or likely thousands of years. Such forms of human-animal relations are even more challenging to recognize in the archaeological record. This presentation frames the question of hunter-gatherer herd management within the context of a 7,000–8,000-year-old habitation site in far eastern Mongolia.

Janz, Lisa [244] see Brunson, Katherine

**Janzen, Anneke (Max Planck Institute for the Science of Human History)**

[203]

*Chair*

**Janzen, Anneke (Max Planck Institute for the Science of Human History), Lauren Malone (University of Tennessee, Knoxville) and Amy Mundorf (University of Tennessee, Knoxville)**  
[203]

*How Burned Is Too Burned? ZooMS-Based Identifications of Thermally Altered Bone*

Identifying skeletal remains to species can be a challenge in archaeological and forensics contexts. The high rates of fragmentation and often poor preservation of bones have rendered skeletal fragments specimens unidentifiable beyond broad categories, such as “large mammal.” Identification of skeletal specimens through Zooarchaeology by Mass Spectrometry (ZooMS), or peptide mass fingerprinting of bone collagen, offers an avenue for identification of morphologically ambiguous or unidentifiable bone fragments that is less expensive and requires less bone than aDNA analysis. However, burned bones, which are common in the archaeological record, are particularly challenging, as high temperatures denature collagen. Yet, recent preliminary research shows that some burned specimens still yield enough collagen for coarse identifications. This paper explores the degree of burning that can still reliably yield collagen for species identification. We present a system of visual criteria (e.g., bone color and texture) that will allow zooarchaeologists and other researchers, including forensics practitioners, to make informed decisions on whether ZooMS will be a good option for species identification.

Janzen, Anneke [71] see Malone, Lauren

**Jaouen, Klervia (Géosciences Environnement Toulouse/CNRS), Pauline Méjean (Géosciences Environnement Toulouse/CNRS), Benjamin Fuller (Géosciences Environnement Toulouse/CNRS), Jéssica Mendes Cardoso (Géosciences Environnement Toulouse/CNRS) and Zineb Moubtahij (Géosciences Environnement Toulouse/CNRS)**  
[252]

*The Potential of Zn Isotope Ratios ( $\delta^{66}\text{Zn}$ ) to Track Different Types of Plant Consumption*

There is currently a growing body of evidence that Zn isotope ratios ( $\delta^{66}\text{Zn}$ ) are a useful tool to assess the trophic level of past humans and animals from archaeological sites. However, the isotopic variability which has been previously measured in herbivorous species remains unexplained. In this contribution, we explore and attempt to explain the variability of Zn concentrations and isotope ratios in (1) food products and (2) teeth and bones of various species of herbivores from different geographical and archaeological contexts. Considering the bioavailability of Zn in different food products, we will then discuss the potential of  $\delta^{66}\text{Zn}$  measurements to track specific types of plant consumption among herbivorous and omnivorous species.

Jaouen, Klervia [3] see Cardoso, Jessica

Jaouen, Klervia [252] see Moubtahij, Zineb

Jara, Camila [237] see Alanis, Jorge

Jara, Camila [237] see Rowe, Sarah

**Jarl, Johan (UConn) and Angela Bruch (Senckenberg Research Institute)****[56]***Phytolith Assemblages as a Proxy for Paleoenvironmental Reconstruction in the Southern Caucasus*

The Southern Caucasus is a biodiversity hotspot, encompassing a spectrum of environments from temperate forests to semidesert steppes. Having seen hominin occupation since 1.8 Ma, the region offers a unique opportunity to study the expansion and evolution of the genus *Homo*, as well as their interaction with the local environment. Unfortunately, poor preservation of pollen and macrobotanical remains has made paleoenvironmental studies in the region difficult. Here, we present the first results of a pilot study investigating the phytolith assemblages of surface sediments from modern vegetation units. Through Linear Discriminant Analysis combined with the interpretation of relative abundances of phytoliths, this study is able to show the distinct phytolith signal produced by different vegetation units. In addition, we show how these modern phytolith assemblages can be used as a paleoenvironmental proxy in the reconstruction of past vegetation. Through the use of phytolith analysis, it is possible to obtain high-quality paleoenvironmental data that can be applied to questions pertaining to the local environment, and the interaction between ancient hominins and their surroundings, at various points in prehistory.

Jarman, Nicholas [244] see Taylor, William

Jarosova, Ivana [3] see Kvetina, Petr

**Jarquin, Juan (University of Nevada, Reno)****[235]***Life on the Edge: Late Holocene Hunter-Gatherers on the Abert Rim*

The archaeological record of the Late Holocene in the Lake Abert-Chewaucan Marsh Basin provides insights into hunter-gatherer mobility and response to climatic change. This paper aims to provide a framework and understanding of how hunter-gatherers adapted to living on the landscape of the largest North American fault scarp, Abert Rim, in south-central Oregon. Artifacts excavated from two house rings at the Poison Creek Rim Site yielded data regarding hunter-gatherer mobility in the Late Holocene. Using lithic analysis, obsidian sourcing studies, and geospatial modeling, I discuss how hunter-gatherers made use of the upland marginal environment of Abert Rim throughout the Late Holocene.

**Jarrett, Greer (Lund University)****[92]***Mapping Midgard: Reconstructing Mental Geographies of Viking Age Seafarers*

This project aims to reconstruct the mental geographies and sailing routes used by Viking Age communities along the Atlantic façade by combining experimental archaeology and critical cartography. This session will present some of the results of recent fieldwork conducted in Norway and explore alternative mapping methods for constructing critical and epistemologically diverse understandings of past peoples and their worldviews. Despite a growing body of evidence for the importance of maritime travel in the Viking Age, we still know surprisingly little about the sailing voyages themselves. In answer to this, a fieldwork campaign was conducted in western Norway between 2021 and 2022 that involved sailing over 1,500 nautical miles in a range of traditional, clinker-built square-rigged boats. These trials have revealed several important considerations about Viking Age seafaring and maritime geographies, some of which are notably absent in the relevant literature. Furthermore, conventional methods for representing these voyages are far removed from the experience of sailing, and of the consequent mental geographies that are conjured up by such experiences. A range of cartographic alternatives will be discussed that may help us come closer to Norse mental geographies and provide a new perspective on sailing, space and experience among maritime communities.

**Jazwa, Christopher (University of Nevada, Reno), Amira Ainis (California State University, Los Angeles), Ryan Anderson (Santa Clara University), Karim Bulhusen Muñoz (Instituto Nacional de Antropología e Historia) and Harumi Fujita (Instituto Nacional de Antropología e Historia)**  
**[71]**

*A Preliminary Chronology of Settlement and Subsistence Patterns in Cabo Pulmo National Park, Baja California Sur, Mexico*

We present the results of our preliminary analysis of the archaeological resources in Cabo Pulmo National Park (CPNP), Baja California Sur, Mexico. Since 1995, CPNP has yielded evidence for ecological recovery of marine resources, although long-term prospects are still in question. As important are the cultural resources in the park and surrounding area, where the archaeological record indicates long-term human use of marine resources. The region was occupied as early as 7120–6755 cal BP, with an increased density of sites within the last 2000 years. The faunal record from two excavated sites, D20 and D27, includes fish, marine turtle, mammal, bird, and shellfish remains, especially oysters, from the adjacent rocky intertidal shoreline. Fish, including sardine (*Sardinops sagax*), were recovered in all but five of the 23 excavated levels. The faunal record from these sites indicates consistent and dense occupation of two prominent points on the coastline for at least 2,000 years. Cabo Pulmo and the surrounding region are located between the more extensively studied La Paz region to the north and Los Cabos to the south, so our work contributes to our understanding of human occupation of the Gulf Coast of the Baja California Peninsula.

Jazwa, Christopher [42] see Banke, Peter

Jazwa, Christopher [122] see Firenzi, Alexandria

**Jefferys, Katherine**  
**[210]**

*Glass Beads from Saudi Arabia in the University of Oregon's Museum of Natural and Cultural History*

This paper will present information on a subsection of glass beads from a diverse collection of artifacts that are presumed to be from the Al Hasa Oasis region in Saudi Arabia and donated to the University of Oregon Museum of Natural and Cultural History (MNCH). Although glass beads and objects are a commonly studied artifact in the Middle East, little analysis has been done to date on glass beads from Saudi Arabia. Glass beads, as small portable objects, are ideal for studying trade and interaction networks. Here we discuss 17 beads that were chosen from the MNCH collection. A typological study and compositional analysis using LA-ICP-MS identified multiple glass bead types from a variety of locations and time periods. We conclude by considering the implications for understanding Saudi Arabia's place in global glass bead exchange networks.

Jenkins, Dennis [235] see Blong, John

Jenkins, Dennis [130] see Kingrey, Haden

Jenkins, Dennis [21] see Saper, Shelby

**Jenkins, Jessica (Flagler College) and Martin Gallivan (William & Mary)**  
**[203]**

*An Interdisciplinary Approach to Understanding Sustainable Oyster Harvesting Practices during the Woodland and Protohistoric Periods in the Lower Chesapeake Bay*

In 2021, an interdisciplinary team of archaeologists, marine biologists, and geologists was formed to answer the question: is it possible to infer which part of the estuary an oyster was harvested from based on morphology and bioindicators observed on archaeological shell? In the Lower Chesapeake Bay, there are three “zones” conducive to oyster growth—the intertidal, the shallow subtidal, and the deep subtidal. We have argued elsewhere that, except in the case of feasting, past peoples in the York River estuary, Virginia, harvested oysters sustainably by focusing their day-to-day collection on intertidal zones, leaving offshore subtidal parent reefs to spawn. To test this hypothesis, modern samples of oysters were collected from each zone in the York River. Attributes of modern oyster shells, including size, shape, presence of sponge

boreholes, and associated biofoul, were used to characterize variations among samples as they related to harvest zones. In this paper, we compare the results of the modern oyster study to previous studies of archaeological shell collected from Woodland and Protohistoric sites on the York River to determine if the oyster fishery was harvested selectively in the past in accordance with sustainable practices and ritual activities as previously hypothesized.

**Jenks, Kelly (New Mexico State University)**

[215]

*Chair*

**Jenks, Kelly (New Mexico State University)**

[215]

*Cañon de Carnué: A Place of Connection*

Cañon de Carnué (also known as Tijeras Canyon) is a place of transition—between the Rio Grande Valley and Great Plains, the Sandia and Manzano Mountains, the alpine forests and riparian bottomlands, and between the communities—human and nonhuman—that inhabit these environments. We often understand this canyon through the different places it connects, but perhaps it is more useful to focus on the canyon itself as a place of connection, and to consider how these connections shape the communities that occupy the canyon. In this paper, I explore the many connections made or maintained by the communities who lived at San Miguel de Carnué (LA 12924), a multicomponent archaeological site above Tijeras Creek near the west end of the canyon. I also consider how these connections, in this place of transition, could lead to transformation.

**Jennings, Justin (Royal Ontario Museum)**

[60]

*Out of Africa, or How Earlier Forms of African Governance Can Save the World*

One of the consequences of European colonialism is the narrowing of the world's political imagination. When colonists began to carve up Africa in the late nineteenth century, they were met with a dizzying range of governance systems—systems most famously pondered by academics in Fortes and Evans-Pritchard's (1940) *African Political Systems*. Ruins like those of Great Zimbabwe and Songo Mnara hinted at even further diversity in the past. This variation was seen as a problem to be solved, however, rather than an opportunity to learn. Only a few forms of government were proper, or even possible, and vast swaths of the continent were transformed to better meet Enlightenment ideals of strong rulers and representative legislatures. Still today, earlier forms of African governance are treated as intellectual curiosities, with little to offer the wider world. This paper challenges this view. In an era of late capitalism and ever-accelerating globalization, the sovereign nation-state model seems ill-equipped for the twenty-first century and beyond. We need to explore other ways of creating enduring collectives at all levels of government. By showing what can be learned from archaeological case studies, I underline the existential importance of understanding Africa's past.

Jennings, Justin [45] see Leachman, Robert

**Jensen, Alicia**

[182]

*Public Outreach for the Historic United Comstock Merger Mill*

The United Comstock Merger Mill, locally known as the American Flat Mill, was a cyanide mill constructed in 1922 on the eastern portion of the American Flat near Virginia City, Nevada. This mill, located within the boundaries of the Virginia City National Historic Landmark, represented one of the last large-scale efforts to mine and mill ore on the Comstock. The “last gasp” of the Comstock was unsuccessful, and the mill closed in 1926. After abandonment, the mill became a popular local gathering spot and a physical safety hazard. In late 2014, the Bureau of Land Management (BLM) demolished the mill after reaching an agreement with the

Nevada SHPO about how the mill would be documented and how that information would be shared with the public. This poster shares the multiple public outreach projects the BLM completed to share the history of the mill, including a documentary, interpretive kiosk, brochure, virtual tour, podcast, and mobile exhibit.

**Jensen, Anne (University of Alaska, Fairbanks/Bryn Mawr College)**

[96]

*Learning about a Place through Time: Kilusiktok Lake, North Slope, Alaska*

This paper examines landscape learning through the lens of a particular landform near Kilusiktok Lake. The landform has been used by humans for at least 2,000 years, as evidenced by radiocarbon dates on a burnt bone layer, right up to the present, based on coffee cans, meat packages from the local store with expiration dates, and 2022 Facebook posts. We look at how people with contrasting backgrounds (Iñupiat hunters of various ages who had been raised in the area, archaeologist who was raised in very different environment) first learned about the place. We also consider recent changes in the landscape, and how people are leaning about and adapting to them and to the downstream effects on travel and prey (primarily caribou) behavior, as well as a possible material correlates of this adaptation. We then consider how these examples may be applied to past movement into and use of this and similar landscapes.

**Jensen, Samuel (Brigham Young University)**

[249]

*A Reevaluation of Viejo Period Architecture and Construction in the Casas Grandes Region*

From 1958 to 1961 Charles Di Peso and Eduardo Contreras Sánchez conducted extensive archaeological excavations at Paquimé and the Convento sites in Chihuahua, Mexico. These excavations produced the data that forms the bulk of our understanding about the Casas Grandes archaeological culture during the Viejo period (approximately 700–1200 AD). In the published volumes reporting the findings of these excavations, Di Peso divided the Viejo period into three phases based on architectural variation through time. Since the publication of Di Peso's volumes, that tripartite division of the Viejo period has been heavily critiqued. Those critiques, however, have not proposed a formal revision to Di Peso's architectural typology or chronology. In this paper, I reexamine published archaeological data in light of architectural data from recent excavations at the Viejo period San Diego site in Chihuahua in order to more formally establish an updated architectural typology. Additionally, I evaluate the validity of the concept of a northern and southern zone within the Casas Grandes region, distinguished by architectural variation, that has recently taken hold in publication.

Jereb, Nathan [123] see Diciuccio, Laurel

**Jerrems, William**

[148]

*Chair*

**Jerrems, William**

[148]

*Pleistocene Horses in the Archaeological Record: A Focus on the Great Basin*

There is a long history of horse exploitation throughout Eurasia; for instance, the Boxgrove site, England (500 kya), the Schöningen site, Germany (350 kya), and numerous Late Pleistocene sites spread across Eurasia (from the Aurignacian thru the Magdalenian 45 kya–15 kya). The evidence suggests that horses were only second in line of importance to reindeer as an animal food source. Yet the only site in North America with definitive evidence of horse hunting/butchering is at Walley's Beach, Alberta, Canada (blood residue on Clovis tools). Horses proliferated in the Americas during the Pleistocene but vanished from North America 13,100 years ago. There are many instances where horse remains create a background noise in Great Basin rockshelters and caves but with only minimal evidence of human intervention. Is there enough evidence in

the Intermountain West to confirm the presence of horse hunters in the west during and possibly before Clovis times? I wish to review the evidence from several sheltered sites in the northwestern Great Basin, particularly Fishbone Cave on the shore of ancient Lake Lahontan, for the importance of horses to the Paleoamericas.

Jew, Nicholas [45] see Rospopo, Steven

**Jiang, Ming (Chengdu Cultural Relics and Archaeology Research Institute), Jade d'Alpoim Guedes (University of California, San Diego), Zhanghua Jiang (Chengdu Cultural Relics and Archaeology Research Institute), Zhiqing Zhou (Chengdu Cultural Relics and Archaeology Research Institute) and Rowan Flad (Harvard University)**

[202]

*Environmental Context and Archaeobotanical Results of the Chengdu Plain Archaeological Survey*

The constraints and advantages presented by the natural environment of the Chengdu Plain had important impacts on how ancient humans exploited and occupied this environment. This poster considers how that the Plain was subject to a high degree of geomorphological remodeling due to frequent flooding and erosion in the Longmen Chain. It is likely that this has impacted our ability to identify ephemeral archaeological sites, particularly those belonging to forager populations. Compared to the highlands that surround it, the Chengdu Plain also benefits from warmer temperatures, an almost frost-free year, and easily amenable water resources. All of these factors have made the plain an environment that is particularly well adapted to rice agriculture. Prior to CPAS, little survey archaeobotany had been carried in contexts like the Chengdu plain. The low-lying, flat, and deeply alluviated nature of the plain presented challenges to carrying out the types of archaeobotanical survey that has been employed with success in other regions. This poster summarizes the challenges we met when trying to target archaeobotanical remains in this unique environment and our results.

Jiang, Zhanghua [202] see Flad, Rowan

Jiang, Zhanghua [202] see Jiang, Ming

Jiang, Zhanghua [202] see Li, Shuicheng

**Jiménez Osorio, Liana (Universidad Nacional Autónoma de México /Instituto de Investigaciones Estéticas)**

[91]

*Santuarios Mixtecos de origen precolonial: Una herencia viva*

El tema de los santuarios y paisajes sagrados de origen precolonial en Ñuu Savi o Mixteca lo he estado investigado desde la arqueología, antropología, los códices y documentos coloniales. También han sido fundamentales las experiencias y aprendizajes que he tenido en diferentes rituales mixtecos. De esta manera, en esta plática me enfocaré en tres lugares sagrados de origen precolonial que están vigentes hoy en día como parte fundamental de la religión y cosmovisión Mixtecas. Antes de entrar de lleno al tema, primero hablaré del concepto de herencia viva, el cual me ha dado la pauta para abordar las continuidades y cambios en los santuarios actuales de origen precolonial. Después señalaré algunas características que definen a los santuarios.

**Joannin, Sebastien and Amy Cromartie (Cornell University)**

[56]

*Quaternary Vegetation and Climate in the Lesser Caucasus, an Update*

The numerous archaeological discoveries in the Lesser Caucasus document the crucial role that this territory had for humans more than 2 Ma. In particular, the scientific debate has highlighted its strategic position for phases of migration “out of Africa,” and expansion to the Eurasian continent. The role of climate has also been discussed as a forcing factor of Pleistocene phasing (Leroy et al. 2011). Two and a half million years

requires us to take into account all the forcing factors in contexts in which humans evolved. Thus, this includes large changes due to significant geodynamic activity and the terrestrial environments inherited from the Pliocene that have been modified by ever colder and longer climatic cycles. The diversity of ecosystems must be contextualized throughout the lens of tectonic uplift and the distribution of precipitation. While, our work does not cover the entire period, we highlight several sedimentary archives, placed end to end, as windows to this past through the pollen record. (Leroy, S.A.G., Arpe, K., Mikolajewicz, U., 2011. Vegetation context and climatic limits of the Early Pleistocene hominin dispersal in Europe. *Quaternary Science Reviews*, Early Human Evolution in the Western Palaeartic: Ecological Scenarios 30, 1448–1463. <https://doi.org/10.1016/j.quascirev.2010.01.017>)

Joannin, Sebastien [16] see Cromartie, Amy

Johnson, Bart [62] see Coughlan, Michael

Johnson, Benjamin [72] see Haefner, Joseph

Johnson, Eileen [239] see Hurst, Stance

Johnson, Eric [14] see Matthews, Christopher

Johnson, Erlend [93] see Bell, Ellen

### **Johnson, Jacob (Florida State University)**

**[75]**

*Tracking Temporal and Behavioral Patterns through the Distribution of Material Culture at the Evergreen Plantation*  
The Evergreen Plantation is a robust and well-preserved sugar cane plantation complex in Southeast Louisiana, that has its roots dating back to the formation of the Louisiana colony. Material culture from the plantation can provide an incredible insight into both temporal and behavioral patterns in the lives of free and enslaved individuals who lived at Evergreen from the mid 1700s until 1950. Analyzing the Evergreen Plantation Archaeological Survey's (EPAS) collection of artifacts and positioning these artifacts within the Plantation's landscape allow for the tracking of these patterns through the archaeological record. This will direct our understanding of how the land was utilized by the enslaved African American community, and then by the freed laborers of the complex throughout all stages of its history. The spatial data analysis aims to assemble a comprehensive detailing of the entire available collection of EPAS to track these patterns through multiple facets of plantation lifeways, most notably derived through ceramic and glass artifact morphology and deposition. Finally, excavations revealed a potentially significant religious structure, allowing analysis on how faith and religion impacted the free and enslaved lives on this plantation landscape.

### **Johnson, Jeremy (Confederated Tribes of Grand Ronde)**

**[121]**

*Archaeological Survey Feasibility of Postharvest Units within the Coast Range*

The Coast Range in Western Oregon is characterized by deeply incised canyons and a climate that promotes rapid growth and diverse communities of vegetation. Due to these characteristics, it is difficult to conduct archaeological investigations within the Coast Range. This problem is further exacerbated by a shortage of staff and lack of field opportunity due to a global pandemic that has left a backlog of unsurveyed postharvest timber units within the Confederated Tribes of Grand Ronde reservation lands. Some of these units have not

been visited for years, and have seemingly lost their window of opportunity of feasible survey. This study characterized postharvest units to determine the feasibility of conducting survey and to ascertain the existence and timing of a window of opportunity for survey following harvest. To this end, vegetation density and height were measured with, and compared to, ease of access and ground visibility within postharvest units completed up to six years prior. Results indicate that there is a window of opportunity that starts closing two years after harvest. Starting around year five, postharvest environmental conditions start to approach pre-harvest levels as rapid growing species are replaced with woody vegetation.

Johnson, Jeremy [69] see Hawks, Dustin

**Johnson, John (Santa Barbara Museum of Natural History), Thomas Stafford (Stafford Research Laboratories), G. James West (University of California, Davis), Heather Thakar (Texas A & M University) and Katherine Bradford (Santa Barbara Museum of Natural History)**  
[127]

*Arlington Springs Chronostratigraphy and Implications for Early Human Settlement along North America's Pacific Coast*

What may be the earliest dated human skeletal remains so far discovered in North America come from the Arlington Springs Site on Santa Rosa Island, California. To corroborate the 13,077–12,656 2-sigma cal BP age of this ancient Native American, stratigraphic investigations were undertaken to place this discovery in its chronological and paleoenvironmental context. Radiocarbon dating documents a sedimentary record spanning 16,000 years. The remains of Arlington Springs Man underlie a prominent black soil associated with the Younger Dryas period. A time series analysis of elemental platinum and palladium shows a pronounced peak at the base of the Younger Dryas black soil layer. Bayesian statistical analysis of over 80 radiocarbon dates refines our understanding of geochronological context of the earliest human presence in coastal California and correlates sedimentation rates with sea level rise at the end of the Pleistocene.

**Johnson, Lisa (University of Nevada, Las Vegas), Lucas Johnson (Far Western Anthropological Research Group), Arianna Campiani (Sapienza-Universita de Roma), Rodrigo Liendo Stuardo (Universidad Nacional Autonoma de Mexico) and Rosemary Joyce (University of California, Berkeley)**  
[172]

*Household Diversity in a Palenque Neighborhood: Preliminary Considerations*

Increasingly, archaeologists working in Classic period Maya cities have focused their attention on defining “neighborhoods” as a means to reconcile both a bottom-up and top-down approach. A consideration of Palenque’s urban form and patterns in the clustering of stone structures along built terraces makes the existence of neighborhoods within this densely populated city highly likely. However, neighborhood boundaries and dynamics have yet to be strongly defined and supported by excavation data. In this talk we will share some preliminary data following three field seasons of excavations in select residential groups. We consider lidar imagery revealing spatial proximity, shared topography, and bounded sectors created by waterways coupled with intensive excavations in and around structures and patios to recover artifactual data related to production, consumption, and discard practices. Preliminary data suggests there were considerable differences in the political authority, ritual emphasis, and daily practices across households that were spatially close and occupied contemporaneously. We are left asking, do these differences reflect a hierarchical social organization at the neighborhood level, and/or a difference in the intensity of face-to-face interaction due to spatial proximity and topography? These questions are yet to be resolved but will be explored further in future investigations.

Johnson, Lucas [172] see Johnson, Lisa

Johnson, Lucas [2] see Smith, Benjamin

**Johnson, Meghan (Archaeological Investigations Northwest Inc.)**

[171]

*Chair***Johnson, Meghan (Archaeological Investigations Northwest Inc.) and Terry Ozbun (Archaeological Investigations Northwest Inc.)**

[171]

*Recognizing Debitage Diagnostic of Particular Reduction Technologies at Lithic Scatter Sites in the National Forests of Eastern and Central Oregon*

The Pacific Northwest Region of the United States Forest Service is updating guidance for implementation of a 1984 Programmatic Memorandum of Agreement (PMOA) for management of lithic scatter sites in eastern and central Oregon National Forests. The guidance update emphasizes meaningful consultation with Native American tribes to address lithic scatter significance under National Register Criteria A–C. Under Criterion D, the guidance identifies methods for more technologically robust analysis of flakes and flaked stone tools. Since diagnosticdebitage attributes vary between technologies, the guidance focuses on key flake attributes that can help distinguish common reduction strategies from more rare technologies, and thus aid in improved evaluation practices. This presentation focuses on the diagnostic flake attributes of several technologies, both common and rare, found in eastern and central Oregon.

**Johnson, Myra (Confederated Tribes of Warm Springs)**

[144]

*Discussant*

Johnson, Norma [96] see Krasinski, Kathryn

**Johnson, Peri (University of Illinois, Chicago)**

[63]

*Chair***Johnson, Peri (University of Illinois, Chicago) and Ömür Harmansah (University of Illinois, Chicago)**

[63]

*When It Rains Now, It Is a Disaster: Heritage Landscapes during Climate Change*

Archaeological landscapes are not heritage landscapes similar to the picturesque; they are the living heritage of the contemporary inhabitants and stakeholders who live with the past, ecological destruction, and climate change. Our paper is informed by the Yalburt Yaylası Archaeological Landscape Research Project (2010–2021) in western central Turkey. At its inception, the project was designed to research the landscape of a thirteenth-century BCE monumental pool at the site of Yalburt Yaylası. In the winter of 2022, disastrous rain washed the asphalt of the rural road bisecting the site and deposited eroded bedrock and asphalt in the pool. Two months earlier, the preservation council had approved a project to install security cameras and fence the pool, as if the monument could be set aside from its landscape during climate change. Whereas research on ancient landscapes—particularly their geomorphology and phenomenology—is central to archaeological fieldwork, in the face of today’s ecological and heritage destruction, setting aside the ancient from contemporary political ecology repeats the mistakes of the imperial vision that set aside picturesque from industrial landscapes. Our paper focuses on our advocacy during our 2022 study season for a preservation project that allows for precipitation that now “rains a disaster (afet).”

**Johnson, Phyllis (Archaeology Lab, Augustana University)**

[154]

*Obsidian Blade Production, Social Inequality, and Agency at the Classic Maya Capital of Tamarandito*

Archaeologists studying the Maya have traditionally considered obsidian to be a luxury good that was often

tightly controlled by the elite during the Classic period. Archaeological evidence from the Classic Maya capital of Tamarindito in Guatemala challenges these long-held assumptions, however. At Tamarindito, multiple lines of evidence support the assertion that social and economic inequality existed between elites and so-called “commoners,” but evidence for significant production of obsidian within at least two low-status households (one of which holds the majority of all obsidian recovered from Tamarindito to date) illuminates the role of agency and choice within non-elite households at Tamarindito and begs archaeologists to further rethink both top-down and bottom-up perspectives on Maya obsidian production.

**Johnson, Sarah (University of Oklahoma), Tanvi Honap (University of Oklahoma), Cara Monroe (University of Oklahoma), Marc Levine (University of Oklahoma) and Cecil Lewis (University of Oklahoma)**

**[163]**

*Oral Metagenomes from Native American Ancestors Reveal Distinct Microbial Lineages in the Precontact Era*  
Disruption of the microbial community in the oral cavity, by diet, host genetics, or environmental factors, can lead to dysbiosis, promoting preferential growth of pathogenic microorganisms leading to a diseased state. The calcified matrix of dental calculus is a good source for ancient biomolecules belonging to bacterial species, allowing researchers to look at how pathogens and other bacteria have evolved through time. In collaboration with the Wichita and Affiliated Tribes, a federally recognized tribe in Oklahoma, USA, precontact agricultural Wichita ancestors from approximately 1250 to 1450 CE were paleopathologically assessed for dental disease and DNA was extracted from dental calculus. Double-stranded DNA libraries were uracil deglycosylase-treated and shotgun-sequenced with Illumina technology. DNA preservation was assessed, microbial composition was taxonomically profiled, and strain diversity was phylogenetically analyzed. Ancient oral microbial profiles were identified from 26 Wichita ancestors and several displayed relatively high amounts of bacteria affiliated with periodontitis. Geographic structuring was observed in the phylogenetic analysis of these bacteria and microbial profiles of the Wichita ancestors clustered with those of other precontact Native American individuals. Presented is the largest oral metagenome dataset from an ancestral Native American population and informs on oral bacterial ecology prior to colonial influence and industrialization.

**Johnson, Taryn (Texas A&M University), Bryan Hockett and Anna Linderholm (Stockholm University)**

**[43]**

*A Comparison of DNA Metabarcoding and Macroremains Analysis for Dietary Reconstruction using Coprolites from Bonneville Estates Rockshelter, Nevada*  
Coprolites are increasingly the subject of multiproxy analyses, but there is need to determine how the data, results, and interpretation of coprolite contents could differ depending on the methods chosen. This study presents a comparison of DNA metabarcoding and macroremains analysis performed on 10 coprolites from Bonneville Estates Rockshelter, Nevada. While the dietary information from both genetic and macroscopic remains largely conform to previous knowledge about subsistence practices from the site, the two methods show minimal overlap in identified taxa. The findings suggest that if genetic data is bolstered with a targeted comparative library, it may detect more digestible foods than macroremains analysis, while macroremains are likely to contain a large amount of less digestible but identifiable taxa. The two methods are complementary, but because they give different levels of data, they should be used together when possible.

Johnston, Carly [143] see Arakawa, Fumi

**Johnston, Cheryl (University of Cincinnati), Jennifer Jordan Hall (KYK9 Search and Reunite Services LLC), Kevin Schwarz (ASC Group Inc.), Andrea Crider (ASC Group Inc.) and Taylor Bryan (ASC Group Inc.)**

**[174]**

*Use of Human Remains Detection Dogs to Find Unmarked Precontact Human Burials in the Ohio Valley*

Remote sensing techniques, including magnetic survey and ground penetrating radar, are commonly used in archaeology as part of cultural resource management projects. In this presentation, we share our experience using a complimentary and nascent remote sensing technique to locate human remains on archaeological sites, human remains detection (HRD) dogs. Dogs (*Canis lupus familiaris*) have been used with increased frequency to locate human remains in forensic settings, particularly since 9/11/2001. Only recently have they been used to locate ancient human remains. HRD dogs have successfully located buried human remains at a Fort Ancient village site in the Ohio Valley, which dates from AD 1050 to AD 1275. The specialized HRD dogs found numerous human burials that were not detected by other modalities. Our results suggest that using these specialized HRD dogs in archaeological prospection is uniquely beneficial from a variety of perspectives. We will discuss the benefits of this search modality along with guidelines for proper site preparation.

Johnston, James [62] see Coughlan, Michael

**Jolicoeur, Patrick (University of Toronto)**

[219]

*Metalheads about the Polar Sea: Metal Use in the Eastern Arctic and Its Significance for Understanding Broader Interaction Dynamics*

The earliest metal use in the Eastern North American Arctic comes from the Pre-Dorset period (ca. 5000–2500 cal BP). However, evidence for the material being used regularly and outside its immediate source regions emerges millennia later in the Late Dorset period (ca. 1500–700 cal BP). While physical evidence of metal remains relatively rare at most Late Dorset period sites, proxy evidence for its use has demonstrated that the material was much more common than previously thought. Interestingly, metal did not “replace” lithic materials but rather operated in conjunction with them. While metal was seemingly used for a narrower set of activities than stone, it cannot be explained by physical material properties and availability alone. Furthermore, the geographically limited source regions for both copper and iron mean that metal is an excellent data source for understanding the extent and intensity of exchange networks during the Late Dorset period. This paper presents this new proxy evidence of metal-use and debates what this material meant to Arctic peoples and its role in connecting them across thousands of kilometers. Ultimately, metal-use is an important component for approaching broader interaction dynamics between different Arctic groups at this time.

**Jolie, Edward (University of Arizona)**

[248]

*Chair*

**Jolie, Edward (University of Arizona) and Benjamin Bellorado (Crow Canyon Archaeological Center)**

[248]

*Pathways to the Archaeology of Footwear*

This paper introduces the symposium “Approaches to Archaeological Footwear.” Evidence suggests that footwear has been an important component of human technology for at least the last 50,000 years. In addition to becoming a signature feature of dress and adornment in many cultures, footwear has also played an underappreciated role in human mobility and the colonization of diverse biomes. Footwear, including sandals, slippers, moccasins, and shoes, has historically been neglected in archaeological research, however. This is largely due to footwear’s perishability and the challenges to classification posed by its formal and structural variability. Despite these limitations, prior research demonstrates the potential of ancient foot dressing practices to contribute to archaeological questions relating to ancient economies, long-term technological change and innovation, social boundaries and identities, hierarchy and inequality, individual- and population-level health and demography, and population movement, among other things. Here we review the

often disparate threads of research involving different types of ancient footwear, as well as different methodological and theoretical approaches, to highlight the potential of such items for addressing a wide range of anthropological questions and articulate pathways for future research on archaeological footwear.

Jolie, Edward [248] see Coe, Marion  
 Jolie, Edward [248] see Weahkee, Mary  
 Jolie, Edward [245] see Welker, Martin

Joly, Delphine [114] see Ugalde, Paula

**Jones, Emily Lena (University of New Mexico)**

[48]

*Discussant*

Jones, Emily Lena [179] see Chapman, Larkin  
 Jones, Emily Lena [48] see Conrad, Cyler  
 Jones, Emily Lena [76] see Judkins, Abigail

**Jones, Eric (University of South Carolina), Annabelle Lewis (University of South Carolina) and Gabby Cruz**

[44]

*Wealth, Status, and Agricultural Production at a Mid-Nineteenth-Century Farmstead in Upstate New York*  
 We examine a sample of surface-survey-collected ceramics from the Cook Farmstead, which was in operation in Fenner, NY, during the second half of the nineteenth century. After the farm stopped operation around the turn of the century, the house remained in that location until the late 1930s, when it was moved a mile down the road. Since that time, the area containing the house has been largely undisturbed. The well-bounded dates, good census records, and small number of occupants for this site make this a good case for examining ceramic assemblages as they relate to particular residents. As such, we examine the relationship between farm economic production, household wealth, and status display using ceramic wares and farm production data from census records. Results suggest that household wares were related to status display in the nineteenth century, which contrasts with twentieth-century behavior where buildings and landscapes were more often used. We explore how and why that shift in the relationship between wealth, status, and materiality occurred.

**Jones, Jeffrey (Western Michigan University) and Tyson Hughes (Crow Canyon Archaeological Center)**

[90]

*Educational Programming and the Perceived Benefits of Participation at Crow Canyon Archaeological Center*  
 Crow Canyon Archaeological Center (CCAC) has a strong and lasting tradition of enjoining participants in the study of cultural continuity, change, and environmental adaptation in the desert Southwest, and serves as an innovative model for experiential learning through public archaeology. This presentation centers on educational programming at CCAC and the perceived benefits of participation. It provides background, context, and examples of curricular activities and discusses evolution over time. It will further report findings from an empirical study of students' lived experiences and meaning-making processes as they engage in such programming. We take an interpretive ethnographic approach in this research, positioning within curricular and programmatic structures to access situated perceptions and experiences. The research sample is comprised of middle and high school groups, a college field school, and adult programs that we tracked over a summer field season. Data sources include field notes, semi-structured interviews, and post-program surveys. This exploration of how participants experience transformational learning in the context of curriculum and

programs, strategic mission, and sense of place will focus on lessons learned and implications for the field. It may interest diverse scholars and practitioners working to promote cultural literacy through public archaeology and heritage education.

Jones, John [46] see Siegel, Peter

**Jones, Kara (UNLV)**

**[46]**

*Fishing Features in the Mojave Desert and Beyond: Implications at Ivanpah Dry Lake, NV*

The Mojave Desert is a host of many now desiccated Holocene lakes. Fishing features are rare along these lakeshores, but they do occur. Recent investigations at Ivanpah Dry Lake in the Mojave Desert along the California/Nevada border have revealed a complex of fishing features including fishing platforms and fishing circles, connecting this area to the fishing traditions seen throughout the region. This discovery increases the likelihood of similar finds in other understudied Holocene lakes in the area, specifically those known to host brine and fairy shrimp populations. In this paper, I discuss these features and place them in a regional context. The study area encompasses the Basin and Range province, covering areas from the Snake River Plain of southern Idaho to the Salton Sink in southern California and Northern Baja California. Four main lakes have been included: Silver Lake/Soda Lake, Cronese Lakes (East and West), Lake Cahuilla (now the Salton Sea), and our recent work at Lake Ivanpah (now known as Ivanpah Dry Lake).

Jones, Kara [168] see Roth, Barbara

**Jones, Lauren, Anna Linderholm (Centre for Palaeogenetics, Stockholm University) and Michael Waters (Texas A&M University)**

**[121]**

*They're Alright: Late Quaternary Fossil Pocket Gopher DNA Provides Nuanced View of Climate Changes at Hall's Cave, Texas*

Although considered pests to farmers and golfers alike, gophers—specifically pocket gophers (family Geomyidae)—can be excellent proxies for assessing climate change in archaeological contexts owing to their penchant for living in specific soil conditions. At the Hall's Cave site in Kerr County, Texas, geomyids are found in most of the radiocarbon-dated stratigraphic units, including those associated with periods of environmental change. In this study, we use ancient DNA to evaluate the distribution of geomyid species throughout the site in combination with the nearly 20,000 years of clearly defined stratigraphy to provide a finely-tuned view of the climatic changes experienced at Hall's Cave. In addition, this study will also focus on identifying what genetic adaptations and structural population differences in geomyids, if any, might have been driven by the fluctuating climate. Ultimately, we hope that the results of this study will aid in developing our understanding of why certain species are able to persist through ecological stress while others cannot.

Jones, Olivia [44] see Prascik, Bethanny

**Jones, Shelby (NM Office of Archaeological Studies), Eric Blinman (NM Office of Archaeological Studies), Jon Lohse (Terracon Consultants, Houston) and J. Royce Cox (NM Office of Archaeological Studies)**

**[239]**

*Archaeomagnetic Directional Studies as a Tool for Understanding Feature Form and Function: A Case Study of Two Burned Rock Features in a Multicomponent Site in East Texas, USA*

Directional archaeomagnetic techniques were used to propose use-history models for two burned rock features at archaeological site 41AN162, in Anderson County, Texas, USA. While common in the region,

such burned rock features are rarely associated with cultural artifacts that indicate their function. Archaeologists have debated how these features are related to human behavior in their creation, use, and abandonment. Archaeomagnetic studies can be employed to shed light on these questions. Thirteen oriented rocks were collected from two features. The rocks of Feature 5 were thoroughly heated and the vector results of the rock surfaces and interiors show a north and down direction nearly parallel to the expected field for the locality, implying that the rocks of the feature have remained substantially in situ since the feature's last significant heat exposure. Preserved magnetic remanences of the Feature 16 rocks were severely overprinted and have within-rock magnetic qualities that suggest reuse and lower temperature of use. The magnetic inclination data and archaeological context suggest that the rocks may have been heated as part of a covering layer rather than as a pit lining, while the declination orientations suggest the covering layer was removed to expose the target of the heating event.

Jong Haines, Julia [169] see Alders, Wolfgang

**Jonsson, Emily (University of Arizona) and Caitlin Stewart (Cornerstone Environmental Consulting LLC)**

**[45]**

*Settlement Patterns and Land Use on the Shivwits Plateau: Insights from a Cultural Resources Inventory on the Grand Canyon-Parashant National Monument*

Archaeological research on Virgin Branch Puebloan groups has primarily focused on the Moapa Valley and lowland Virgin areas, despite widespread occupation across modern-day southern Nevada, southwestern Utah, and northwestern Arizona. Only a small percentage of the Shivwits Plateau has undergone study by cultural resource inventories or academic excavations. This poster utilizes data from a cultural inventory of 1800 acres conducted prior to an undertaking within the Grand Canyon-Parashant National Monument. The results of this inventory and the density of cultural material identified lend themselves well to a small-scale analysis of settlement patterns and land use areas on the Shivwits Plateau. The identified site types and their associated cultural material indicate continuous occupation of the area with a potential change in land use through time.

Jopp, Zoe [181] see Crowley-Champoux, Erin

Jordan, Peter [92] see Fauvelle, Mikael

Jordan Hall, Jennifer [174] see Johnston, Cheryl

**Jovanovic, Mihailo (Catalan Institute of Human Paleoecology and Social Evolution [IPHES]), Katarina Bogicevic (University of Belgrade), Dragana Đuric (Natural History Museum Belgrade), Draženko Nenadic (University of Belgrade) and Hugues-Alexandre Blain (Catalan Institute of Human Paleoecology and Social Evolution)**

**[240]**

*Paleoenvironmental and Paleoclimatic Reconstruction of the Crvena Stijena Site (Montenegro, South Europe)*

The small vertebrates from Crvena Stijena are a good proxy for the investigation of the changes in the ecosystems in the past, related to climatic variations. We investigate the local paleoenvironmental and paleoclimatic changes that occurred in the area and compare the results with previously studied sites. Geographically, Crvena Stijena is at crossroads for many migrating species including Neanderthals. Our geographical focus is the Dinaric Alps, the massive mountain range, favorable for the creation of limestone caves. Small vertebrate remains are recovered by typical sieving-washing methods during ongoing

archaeological excavations. The archaeological site has very complex stratigraphy and chronology. Layers currently being selected for analysis are M4 and M5, considered to have been deposited during MIS 3 and possibly late MIS 4. More than 1000 specimens of bones and teeth were found, 310 were determined to the level of species/genus/family. The fauna corresponds to the beginning of the first half of MIS 3. The climate was probably colder than today and dry (indicated by the presence of *Chionomys nivalis* and *Dinaromys bogdanovi*), with rocky and open habitats, and reduced wooded areas. Nevertheless, herpetofaunal remains show elements of a warmer climate (*Vipera ammodytes*, cf. *Zamenis situla*, and *Lacerta viridis*).

**Joy, Shawn (SEARCH Inc.)**

[197]

*Building a Long-Term Underwater Economy Advancing Technology, Ecology, and Cultural Resources (BLUE TEC)*

Offshore wind is increasingly vital as the United States intensifies efforts to reduce its carbon footprint and improve energy security through renewable energy. Currently, the time and cost of planning, permitting, and building offshore energy projects are daunting, and mitigation for these projects is in its infancy. Building a Long-Term Underwater Economy Advancing Technology, Ecology, and Cultural Resources (BLUE TEC) uses emerging data and technologies to develop safe, effective, economical, and streamlined practices to advance the cultural permitting process while protecting sensitive offshore resources. This paper presents the lessons learned and paths forward for offshore wind cultural resource managers to protect and mitigate submerged precontact sites and preserve paleolandscapes.

Joy, Shawn [197] see Smith, Morgan

**Joyce, Arthur (University of Colorado, Boulder)**

[242]

*Chair*

**Joyce, Arthur (University of Colorado, Boulder)**

[242]

*The Power of Monuments in Ruin in Prehispanic Oaxaca*

This paper examines the materiality of two ruined monumental architectural complexes in prehispanic Oaxaca: the Main Plaza of the mountaintop city of Monte Albán in the Oaxaca Valley and the acropolis of Río Viejo located on the Río Verde's coastal floodplain. Both of these impressive complexes were important political and ceremonial centers through which urban communities were assembled. Although both fell to ruin during the prehispanic era, they continued to be places of intensive affect that were central to the constitution and transformation of more-than-human communities. The paper considers how the material vibrancy of these ruins differed in ways that both brought together and destabilized communities. After its abandonment, the Main Plaza, now viewed from afar by the people in the valley below, continued to assemble substances important to human well-being including rain, clouds, and sky. The slow deterioration of the plaza's durable stone masonry buildings was relatively rarely experienced by people, however. By contrast, the earthen architecture of the acropolis, still located in the center of the city, rapidly eroded and decayed in the tropical lowland climate. These processes of ruination actualized different capacities contributing to the coming together of some communities and the dissolution of others.

Joyce, Arthur [102] see Aguayo Ortiz, Elaine

Joyce, Arthur [91] see Ichikawa, Akira

Joyce, Arthur [175] see Mayes, Arion

Joyce, Arthur [127] see Perry, Gabrielle

Joyce, Arthur [242] see Rosado-Ramirez, Roberto

Joyce, Daniel [137] see Keevil, Trevor

Joyce, Rosemary [172] see Johnson, Lisa

Judd, Margaret [244] see Schmaus, Tekla

**Judkins, Abigail (University of New Mexico), Caitlin Ainsworth (University of New Mexico) and Emily Lena Jones (University of New Mexico)**

[76]

*Data Quality and Zooarchaeological Interpretation: Investigating Stability in the Human-Animal Relationship at Pottery Mound Pueblo (LA 416)*

The use of existing collections respects the finite nature of the archaeological record while allowing us to address important concepts such as resilience and stability. However, variables such as analyst skill, access to comparative collections, and recovery methods can impact analytical results. How does variability in data quality impact the research questions that zooarchaeologists ask? In this poster, we compare faunal samples recovered from different archaeological projects at Pottery Mound Pueblo to examine several specific aspects of data quality and explore how these differences impact other zooarchaeological measures such as richness and evenness. Our results highlight the importance of considering differences in data quality when conducting comparative analyses. Additionally, this poster provides a useful roadmap for future research by highlighting specific zooarchaeological measures useful for data quality assessment and suggesting areas of inquiry that should be avoided when data quality is poor.

Judkins, Abigail [48] see Conrad, Cyler

**Juengst, Sara (UNC Charlotte)**

[237]

*Chair*

Juengst, Sara [237] see Bowers, Mozelle

Juengst, Sara [237] see Cruz, Zindy

Juengst, Sara [237] see Duke, Guy

Juengst, Sara [237] see Stumpf, Mara

Juliusson, Arni Daniel [173] see Harrison, Ramona

**Kahn, Jennifer (College of William and Mary) and Dana Lepofsky (Simon Fraser University)**

[207]

*Digging Deep: Place-Based Variation in Mā'ohi Agricultural Production Systems across the Late Precontact Society Islands, French Polynesia*

Understanding the socio-ecological contexts of past agricultural systems in complex societies requires expansive datasets, particularly when the goal is to mesh top-down and bottom-up perspectives that generate data at different scales of analysis. Here, we bring together ethnohistoric and ethnoarchaeological documentation, archaeological data on settlement patterns and the distribution and potential productivity of agricultural systems, and ecological information on agricultural potential in five discrete polities in late precontact Mā'ohi society. Our sample can be divided into those polities that are elite- versus commoner-centric and those that are located in productive versus marginal agricultural landscapes. We explore how the lives of the farmers in each of these social-ecological settings might differ in terms of everyday life, the annual calendar, and more extraordinary events. We hypothesize, based on the association of agricultural sites to commoner households, as well as other archaeological and ethnographic evidence, that the labor demands will differ in these two general settings. We further hypothesize that farmers in commoner-centric settings will tend toward collectivism as a response to food pressures and tribute pressures, whereas the farmers in elite-centric settings, who have to contend with more frequent elite demands for tribute, will not have this adaptive response.

**Kallenbach, Elizabeth (Museum of Natural and Cultural History, University of Oregon)****[246]***Fiber Plants of the Northern Great Basin: New Radiocarbon Dates and Plant Identifications for Textiles from Paisley Caves, Oregon*

Early foraging communities in the Northern Great Basin engaged with a diverse and changing landscape over millennia. Archaeologists have developed settlement-subsistence models in relation to climatic shifts based on tool assemblages, dietary studies, and other datasets. In the current study, textiles from Paisley Caves are examined within the context of these models. New radiocarbon dates and fiber identifications using polarized light and scanning electron microscopy illustrate the cultural significance of specific textile plants since the late Pleistocene, and further refine our understanding of foraging practices and seasonal collecting in this area. The Paisley Caves textile assemblage includes basketry, fine cordage, rope, sandals, and netting for hunting and fishing. Textile manufacture and repair would have required collection and processing of several different fiber plants. Herbaceous dicots, or bast fibers, such as *Urtica dioica* (stinging nettle), *Apocynum* sp. (dogbane), and *Linum lewisii* (blue flax) were used to create fine string or cord, while *Artemisia* sp. (sagebrush), *Purshia* spp. (cliffrose or bitterbrush), *Juniperus* sp. (juniper) bark, and monocot stems such as *Schoenoplectus* sp. (tule) were used in basketry construction and other coarse-woven textiles. In particular, stinging nettle and dogbane were used interchangeably for netting and other fine cordage throughout the Holocene.

**Kamp-Whittaker, April (California State University, Chico)****[38]***Discussant***Kandel, Andrew (Heidelberg Academy of Sciences and Humanities), Boris Gasparyan (Institute of Archaeology and Ethnography, Armenia), Angela Bruch (The Role of Culture in Early Expansions of Humans), Anneke ter Schure (Centre for Ecological and Evolutionary Synthesis) and Sanne Boessenkool (Centre for Ecological and Evolutionary Synthesis)****[56]***Sedimentary Ancient DNA Metabarcoding for the Recognition of Human Plant Use at Aghitu-3 Cave, Armenia*

Our knowledge of plants used by Upper Paleolithic humans is limited by the survival of identifiable plant parts. In this study, we present the results of ancient DNA studies of cave sediments from Aghitu-3 Cave in the Armenian Highlands. The cave contains a detailed record of human settlement and environmental variability between 39,000 and 24,000 years ago. Finds include stone artifacts, faunal remains, bone tools, shell beads, charcoal, and pollen. We applied sedaDNA metabarcoding to the sequence and combined the results with pollen data to obtain a temporal reconstruction of plant assemblages available to early humans. Our results reveal a stratification of plant abundance and diversity where DNA preservation reflects periods of occupation, with higher diversity in layers with greater activity. Low pollen concentrations combined with high sedaDNA abundance indicate that plants may have been brought into the cave by animals or humans. We report that the majority of the recovered plants are useful as food, flavor, medicine, or for technical purposes, demonstrating the potential of the environment around Aghitu-3 Cave to support humans during the Paleolithic. This study represents the first application of plant sedaDNA analysis of cave sediments for the investigation of potential plant use by early humans.

**Kanezaki, Yuko (University Museum, University of Tokyo), Carlos Viviano, Otani Hironori, Yune Sato (University of Tokyo) and Jose Onofre (La Dirección Desconcentrada de Cultura de Huánuco)****[249]***New Evidence of Andean-Amazonian Interaction in the Early Horizon: Excavations at the Chaupiyacu Site, Monzón District, Peru*

This paper reports on first identified Early Horizon monumental architectural complexes in the Monzón district, Huamalíes Province, Huánuco, Peru. The Monzón River basin is a cloud forest area at an altitude of

approximately 1,000 m asl. This area is on the route between Chavin de Huantar, an important highland temple site in the Early Horizon, and the sites of the Upper Amazon such as Cueva de las lechuzas, Tingo Maria, or Tutishcainyo, Pucallpa. Identifying the Early Horizon architectural complexes in this area is extremely important for understanding Andean-Amazonian interactions during this period. We conducted the first excavation of the Chaupiyacu site in 2022. This site was built on a mountain ridge located at the confluence of two tributaries of the Monzón River. The entire ridge was terraced, and an artificial platform approximately 10 m high was built at the top. Excavation results indicate that the site was constructed in the first half of the Early Horizon and used until the end of the Early Horizon. While the architectural style showed the influences of contemporaneous mountainous sites, some of the local pottery styles had similarities with the Upper Amazon traditions.

**Kansa, Eric (Open Context / UC Berkeley)**

[195]

*Discussant*

Kansa, Eric [124] see Wells, Joshua

Kansa, Sarah [124] see Wells, Joshua

Kanungo, Alok [210] see Abraham, Shinu Anna

Kanungo, Alok [210] see Fenn, Thomas

**Kappelman, John (University of Texas, Austin), Matthew G. Hill (Iowa State University) and Frank Huffman (University of Texas, Austin)**

[170]

*Todd's Taphonomy: Addressing Questions Too Often Left Unasked*

Larry Todd has played a central role in applying taphonomy to studies of prehistoric human behavior. He developed standardized and, most importantly, reproducible methods of observational quantification. We here present studies of Trinil (Java) and Hadar (Ethiopia), both of which figure prominently in paleoanthropology. The results exemplify the depth of understanding obtainable from Todd's taphonomy. Trinil is the discovery site of the first *Homo erectus*. While most studies concentrate on the hominin remains, the abundant fossils in the bone-bed have been largely overlooked. In many sites with comingled fauna and *Homo* fossils, it is often shown that the fauna was human accumulated; our results from Trinil instead show that the fauna, including *Homo erectus*, was likely deposited as a single hyper-concentrated river deposit. Hadar is the discovery site of "Lucy" (*Australopithecus afarensis*). Her bone breakage patterns are consistent with those produced by a vertical deceleration event (VDE), or a fall from height; however, others have argued that non-arboreal Hadar taxa preserve similar breakage patterns, thus discounting this hypothesis. Our work shows that the compressive and displacement fractures seen in "Lucy" are not present in the non-hominin fossils, and a VDE remains the leading hypothesis for the cause of her death.

**Kappers, Michiel (InTerris Registries—QLC Inc.), Christina Giovas (Simon Fraser University), Claudia Kraan (NAAM Foundation, Curaçao), Kelsey Lowe (University of Queensland, Australia) and Yoshi Maezumi (Max Planck Institute for Geoanthropology)**

[121]

*Proyekto Paisahe Kultural di Kòrsou: The Environmental Legacy of Curaçao's Cultural Landscapes*

In 2022, the Curaçao Cultural Landscape Project (CCLP) initiated a long-term field investigation on the ecological legacy of Indigenous and European colonial occupation of Curaçao, in the southern Caribbean. Drawing together multiproxy records from human settlement, resource use, and environmental conditions

over ca. 4.500 years, this interdisciplinary project seeks to document past human-caused habitat and biodiversity change on this island. Using outcomes of our analyses, we aim to develop sustainability solutions for the present by connecting modern biodiversity to land-use history and providing data for restoration baselines. Here, we report on the findings of the first field season at the Jan Thiel and St. Marie bay landscapes, including results from newly identified sites, <sup>14</sup>C dating, marine sediment coring, geophysical survey, and geoarchaeological and zooarchaeological analyses. Transdisciplinary research such as this allows us to understand the transformation of Curaçao's landscape and link our work about the past to present and future policy challenges in heritage management and climate change.

Karahan, Arzu [232] see Coskunsu, Güner

Karakostis, Alexandros [232] see Ferar, Nolan

Karam-Tapia, Carlos [200] see Pelaez-Ballestas, Ingris

Karapandzich, Alina [142] see Steere, Benjamin

Karastamatis, Kallista [95] see Ahlman, Todd

**Karavanic, Ivor (University of Zagreb)**

[47]

*Chair*

**Karavanic, Ivor (University of Zagreb)**

[47]

*Submerged Paleolithic of the Eastern Adriatic: Research Results, Problems, and Perspectives*

For a long time, underwater archaeology has complemented the image of the past in different periods ranging from prehistory to the Industrial Age. In some regions, such as the Adriatic, it focused primarily on Greek and Roman periods, and on shipwrecks, while research on prehistoric sites has been rare but recently intensified. Paleolithic material was discovered from a few underwater sites at the Eastern Adriatic. The site of Kaštel Štafilić–Resnik (Dalmatia, Croatia) was systematically explored and along with Middle Paleolithic lithics contains also some Upper Paleolithic material. Paleolithic underwater sites provide important material for comparison with land sites and demonstrate that the hunter-gatherers of the Adriatic region occupied a much larger range of territory than documented from research based on land sites only. Therefore, this presentation synthesizes results of underwater Paleolithic research in Croatia focusing on the contribution of these results to a better understanding of landscape, mobility, and behavior of Paleolithic hunter-gatherers. It also discusses methodological problems and limitation of this research and perspectives of Paleolithic underwater archaeology. This research has been partially funded by the project “Last Neandertals at the Crossroads of Central Europe and the Mediterranean” (Croatian Science Foundation, HRZZ-IP-2019-04-6649).

**Kardulias, Drosos (University of Michigan), Jordan Schmidt (Ohio State University), Andrew Savidge (Ohio State University), Amber Swigart (Ohio State University) and Aaron Gonzalez (Ohio State University)**

[105]

*Arisen from the Ashes: Archaeology as Tabletop Gaming in “The Age of Silence”*

“The Age of Silence” is an ongoing *Dungeons and Dragons* campaign in which players' final challenge will be decolonization amid apocalyptic war, either leading a cultural revolution, or joining the forgotten beneath the ashen waste. Realistic material culture is central to the campaign, with agricultural terracing, boulloteria, funerary practices, and tel formation all tangibly significant. Players must consider landscape use, settlement

patterns, and processes of cultural change. Ultimately, saving the world will require inducing cultural change, against the overwhelming forces maintaining the mode of physical and spiritual production. The world itself is a multi-phase site, its cultural taphonomy of colonization, displacement, and inquisition bearing hints to the systems that produced its ruined state. Propaganda forces reliance on the material record, analogy with living peoples, and cryptic ethnographic interviews with subjects as diverse as imprisoned demigods and primordial dragons. Denizens of the deep and far places confront players with kinship systems, lifestyles, and worldviews designed to challenge players' preconceptions. Hominid evolution itself exists as both a mystery and a set of clues for players to follow and interrogate notions of race and diversity present not only within the real world but also *Dungeons and Dragons* as a subculture and product.

Kardulias, Drosos [160] see Kardulias, Paul Nick

**Kardulias, Paul Nick (College of Wooster) and Drosos Kardulias (University of Michigan)**  
[160]

*Insular Resilience at the Edge of Empire: The Early Medieval Kastras of Kalymnos, Greece*

Studies of the shifts following the Arab defeat of the seventh-century Roman Empire generally pass over the Aegean islands that bear the marks of warfare and societal upheaval in their landscapes. The island of Kalymnos has untapped potential to inform an understanding of Roman-Arab warfare in the periphery. This report discusses the several phases of the investigation to date. The initial stage focused on published literature about three seventh-century Roman kastra on Kalymnos to elucidate the dynamics of the island's fortification scheme as a component of the Byzantine/Roman Empire's defensive strategy. GIS analysis of three Roman fortifications elucidated ancient inhabitants' responses to conflict, including priorities of topographic selection and battlefield dynamics. In 2022, we tested the GIS models against conditions on the ground through field visits to the three sites, plus others from a range of periods. Locals provided vital information about access routes to the remote sites, adding key information and indicating possible future avenues to explore. This study has implications for the maintenance of imperial hegemony through local actions, threat responses in insular settings, the ways in which communities can survive cyclical violence, and the tactical details of a civilian populace's response to armed incursions.

Karkanias, Panagiotis [159] see Dusseldorp, Gerrit

**Karkkainen, Vanessa (California State University, Los Angeles), James Brady (California State University, Los Angeles) and Guillermo de Anda (INAH)**  
[81]

*Additional Insights into the Significance of Cave Formations: The Case of Balamkú*

As part of its investigation of subterranean Chichen Itza, the Gran Acuífero Maya (GAM) unsealed the entrance to Balamkú Cave in 2018. The entrance, located in a sinkhole, had been sealed and buried in an apparent act of deliberate termination. In addition, the entire first chamber of the cave including a staircase was buried with rock pulled from surrounding architecture. Before the cave was sealed, a large speleothem was deposited in the cave entrance. This was one of the largest stones used and stratigraphically one of the last stones deposited. It is thought that the speleothem had been set up in an altar structure near the entrance. This paper offers an interpretation of this feature.

**Kassabaum, Megan (University of Pennsylvania), Grace Riehm (University of North Carolina, Chapel Hill), Regina Lowe (University of North Carolina, Chapel Hill), Matthew Capps (University of Pennsylvania) and Vincas Steponaitis (University of North Carolina, Chapel Hill)**  
[95]

*The Return of the Large Enigmatic Pit: Investigating Off-Mound Areas at Pumpkin Lake*

The Pumpkin Lake (22JE517) mound in the Natchez Bluffs region of southwestern Mississippi was excavated as part of the Mississippi Mound Trail project in 2013. The single mound was determined to have been constructed during the Middle Woodland and early Late Woodland periods (AD 200–750). During the

summer of 2022, we returned to assess the extent of non-mound deposits at the site. Systematic surface collections and shovel testing determined artifact densities across the site, and magnetic gradiometry identified a variety of interesting anomalies. Excavation of one of these anomalies revealed an extremely large, precontact pit feature similar to those identified at the nearby Feltus site (22JE500), which was heavily utilized between AD 700 and 1200. Structural comparisons of these enigmatic features suggest tantalizing possibilities regarding connections across both space and time in the Natchez Bluffs and add important data to the ongoing debate about the function and meaning of these large pits to precontact people.

**Kassebaum, Theo (University of North Carolina, Chapel Hill)**

[128]

*Constructing the Herd: Critically Considering the Temporality of Human-Animal Relations in Archaeological Analysis*  
The concept of the herd is often deployed when discussing systems of animal management in the ancient past, sometimes explicitly but most often implicitly. Due to the nature of the archaeological record, zooarchaeological assemblages often compress multiple generations of livestock into a single dataset. Simultaneously, analysis partitions livestock into species categories that do not necessarily represent the composition of the living, managed, herd. Looking to ethnographic and textual records, evidence demonstrates that livestock can be managed in heterogenous groups that are often in flux, comprised of various ages, sexes, and species of animals. In this paper, I critically approach the notion of the “herd” through questions of temporality and memory. By focusing a lens on the “herd” at the Iron Age site of Tel Abel Beth Maacah, I discuss how temporality is constructed as a part of zooarchaeological analysis and the potential ramifications this has on the discussion of human-animal relationships.

**Kater, Thiago (University of São Paulo), Silvana Zuse (Federal University of Rondônia), Fernando Ozorio de Almeida (Rio de Janeiro State University), Richard Burger (Yale University) and Eduardo Góes Neves (University of São Paulo)**

[59]

*Petrographic and Technological Analysis of Ancient Polychrome Ceramics from Upper Madeira River, Amazonia*  
Several researchers have been showing that the southwestern Amazon is a center of cultural innovation and diversity in lowlands South America. Archaeological studies carried out in the last decades have also revealed that the region has ancient centers of ceramic production. At the upper Madeira River, southwest Amazonia, one of these occupations is related to the Pocó-Açutuba Tradition, one of the first ceramics in South America with polychromic painting, dating from the fourth millennium BP. At the Teotônio site, upper Madeira River, beside the considerable degree of variation in the temper, smoothing, polishing, and preservation of the sherds, there is also a postdepositional alteration in the layers where this material is found. To clarify this scenario and to propose a technological overview about these archaeological ceramics, this presentation will show data from macroscopic traces of manufacture provided by technological analysis integrated with a petrographic and archaeometric studies of these ceramics. This dataset gives information that allow to establish the technological elements of ceramics and their operative chain, the methods and choices of the potters, and finally, to suggest the different technological assemblages that could represent the identity of potters and their social environment and/or changes over time.

Kater, Thiago [59] see Pugliese, Francisco

Kater, Thiago [86] see Villagran, Ximena

Kater, Thiago [20] see Watling, Jennifer

**Kato, Hirofumi (Hokkaido University)**

[153]

*Current Issues of Archaeological Decolonization in Hokkaido*

Archaeologists have the authority to recognize and name archaeological sites. The Ainu, at this moment, are not guaranteed the opportunity to participate in this nomination process. Many archaeologists in Hokkaido are non-Ainu experts and are aware that they are researching the history and culture of others. However, it

is not fully understood that the participation of Indigenous peoples in surveys and research is part of Indigenous rights. This paper reports on the unresolved archaeological issues surrounding the Ainu—legally recognized in 2019 as Indigenous peoples of Japan—and their historical and cultural heritage.

Katugampola, Mangala [210] see Dussubieux, Laure

**Kaufman, Brett (University of Illinois)**

[22]

*Archaeology of the Town Square and the Emergence of Democracy in the Phoenician Mediterranean*

Popular government, or “democracy,” spread from Lebanon to the rest of the Mediterranean in the early first millennium BC. This form of state-level, consensus-based sociopolitical organization emerged as a face-to-face practice where members or citizens witnessed and participated in communal debates and decisions. While the Phoenician colonists themselves exercised their rights to assembly, they eventually incorporated and enfranchised indigenous societies, introducing their concept of the state through democratic institutions and urban planning. Historical and epigraphic evidence relay a famous example of one Phoenician national assembly with the Carthaginian People’s Assembly. In recent years, many other town squares that would have hosted assemblies have been excavated at Phoenician and Punic city-states in the Levant, the Iberian Peninsula, North Africa, Sardinia, and Sicily. In this talk, I propose that this phenomenon was not just an extension of contacts with Greece. Rather, it was a result of centuries of Phoenician investment in popular governance, expressed archaeologically through town squares established by the first Phoenician settlers. Through tracking instances of town squares or other planned city plazas, so can we reconstruct and date the spread of democracy.

Kaulicke, Peter [61] see Hernández Garavito, Carla

**Keach, Levi (US Army Corps of Engineers)**

[209]

*The Role of Geophysical Remote Sensing in the Management of Archaeological Resources within the US Army Corps of Engineers, Omaha District’s Missouri River Main Stem Dam System*

The US Army Corps of Engineers, Omaha District (USACE) has approximately 850,000 acres of land within its jurisdiction. Much of this land is rich in both historic and prehistoric archaeological resources and located on reservoir shoreline that is subject to erosion. Erosion is exacerbated by reservoir level fluctuation and fluctuations are intensified by frequent flood-drought cycling associated with climate change. To abate the destructive effects of erosion on archaeological resources, USACE has spent millions of dollars on bank stabilization and shoreline armoring to protect historic properties. However, with over 6,000 miles of shoreline under Omaha District management and ever-present budgetary concerns, USACE cannot protect every archaeological site. It is essential that significant sites under threat are identified and protected in a timely manner. Traditional phase II testing is invasive and disturbance to these areas creates conflicts within and between Tribal Nations and often fails to provide the information on archaeological deposits necessary to plan effective mitigation. Increasingly, USACE has turned to geophysical remote sensing to establish significance, identify deposit locations, and plan effective mitigation. This presentation will provide an overview of recent experiences and lessons learned in contracting for geophysical remote sensing services rather than traditional phase II testing.

**Keevil, Trevor (Purdue University), Melissa Torquato (Purdue University), Sarah Coon (University of California, Riverside), Daniel Joyce (Kenosha Museum Campus) and Erik Otárola-Castillo (Purdue University)**

[137]

*Archaeological Evidence of Human Hunting and North American Megafauna Extinctions: A Statistical Reassessment of the Fenske Bone Surface Modifications*

Archaeologists continue to debate what caused the mass extinction of North American megafauna at the end

of the Pleistocene—human hunting, climate change, or a combination of both. This debate persists because archaeologists lack standardized methodologies to relate unobservable human hunting behaviors with fossilized animal remains. Some researchers suggest human-induced bone surface modifications (BSM), such as cut marks, are the most direct evidence of human hunting in the past. However, nonhuman agent behaviors such as carnivore gnawing can create marks similarly shaped to butchery BSM that researchers mistakenly attribute to human actions. Ultimately, the lack of a standardized method for discriminating and identifying BSM prevents archaeologists from accurately estimating the number of sites in North America with evidence of human-megafauna interactions. This study reevaluates BSM evidence on the Fenske mastodon using high-resolution 3D profilometry, geometric morphometrics, and Bayesian inference. We compare the shape of Fenske BSM to BSM experimentally generated under known conditions, such as human butchery and carnivore feeding trials, to identify what past actions created them. Preliminary results indicate that the Fenske marks are similar in shape to butchery marks, supporting its assignment as a North American site with evidence of human-megafauna interactions.

**Kehoe, Alice (Retired Scholar)**

**[106]**

*Interrogating Decolonization*

“Decolonization” is now frequently used as the term for repatriating human remains and artifacts housed in institutions of the dominant European-derived societies of the Americas. The term does not fit a postcolonial position. “Decolonization” implies, as a derivative from an action verb, an agent performing an act, i.e., an agent of the dominant society’s institution removing the object from its colonial placement. Because most of the directors and employees of the dominant society’s institutions are themselves of European derivation, these agents will seldom be members of the object’s original community. Those from the original community will likely be in a subordinate role, receivers not agents who decolonize. The pair of roles remains within the colonial situation of European-derived dominance and power to act. “Postcolonial” is a very different term, an adjective describing the political stance of a person or situation recognizing these roles of dominance and subordination and working to respect, listen to, and if feasible, collaborate with First Nations persons and communities. In contrast to a decolonizing agent, a postcolonial person may have no authority over collections in institutions, no power to repatriate. Who has power is significant in the context of archaeological practice.

**Keith, Mackenzie (US Geological Survey), Maxwell Schwid (US Geological Survey), Laurel Stratton Garvin (US Geological Survey), Molly Casperson (US Army Corps of Engineers) and Rose Wallick (US Geological Survey)**

**[62]**

*Geomorphic Framework Development for Willamette Valley Reservoirs to Support Cultural Resources Management*

High-head, multipurpose dams and reservoirs constructed in the 1940–1960s in the Willamette Valley encompass a diverse array of landscapes utilized by humans for thousands of years. These reservoirs overlap numerous cultural sites that are subject to dynamic erosion and deposition processes. Although the reservoirs share broad-scale hydrogeomorphic processes, controls, and resultant landforms, each reservoir’s geomorphology is a distinct expression of local valley topography, streamflows, sediment inputs, shoreline erosion, and dam operations. For example, Fall Creek Lake is located in a steep, narrow valley draining the volcanic rocks of the Western Cascade Range; this setting combined with annual 50 m lake-level fluctuations that drain the reservoir have maintained primary tributary channels and created erosional channels and terrace landforms carved through unconsolidated reservoir floor sediments in the lower reservoir. In contrast, Fern Ridge Lake is located in a broad, low-gradient valley draining marine sedimentary rocks of the Oregon Coast Range; preliminary evaluation of this site reveals annual 15 m lake-level fluctuations have influenced different styles of erosion and deposition in multiple tributaries throughout the reservoir. Therefore, a geomorphic framework synthesizing the reservoirs’ geological, historical, and operational factors will aid cultural resource managers in their assessment and addressal of threatened sites.

**Kelley, Kathleen, Guangmau Xie (Guangxi Institute of Cultural Relic Protection and Archaeology), Qiang Lin (Guangxi Institute of Cultural Relic Protection and Archaeology) and Miriam Belmaker (University of Tulsa)**

[109]

*Confirming the Subtropical Paleoecology of Yahuai Cave in Guangxi, China, at 120 Kya through the Taphonomic Analysis of Rodent Remains*

One of the main questions in human evolution concerns the dispersal of modern humans into Eurasia. Given the current tropical environment of South China, we may wonder whether early modern humans entering this region could penetrate the rainforest to forage for food, and indeed whether the environment in this area was suitable for early hominins during their exodus from Africa around 100 kya. As a case study we present the small mammal remains from Yahuai Cave, Guangxi, China, that includes 53 excavated layers that date to 124 ka BP. A postdepositional taphonomic analysis was conducted on rodent post-cranial bones. Variables recorded included weathering, fragmentation, pits, perforations, color, abrasions, and rounding. Results suggest that the area was a warm, humid, dense forested environment. The area was most likely more humid than the contemporaneous Indochinese peninsula and confirms the result from species distribution.

**Kelley, Tess (Harvard University)**

[44]

*Documenting Indigeneity in the Peabody Museum's Ainu Collections*

The Ainu are an indigenous group currently inhabiting the Japanese island of Hokkaido. Traditionally the group practiced a hunter-gatherer lifestyle incorporating plant cultivation and trade, yet forced assimilation into the Japanese state in 1869 significantly altered this way of life. The Peabody Museum of Archaeology and Ethnology of Harvard University stewards a collection of roughly 300 Ainu artifacts, including clothing, weapons, ritual items, cookware, and photographs. These materials were donated overwhelmingly by a handful of Western collectors from the late nineteenth century to early twentieth century, and while they are relatively large in number, they do not constitute a representative survey of Ainu material culture, nor engagement with indigenous concerns. Rather, gaps and repetition in this collection reflect biases of the collectors. By examining these artifacts in conjunction with the Peabody's accession files, other associated artifact documentation, and the personal papers of these Western collectors, it is possible to explore what motivated them to acquire artifacts: what they viewed as their role in this process, the value judgements they made about the Ainu community, and their goals in making donations to Harvard. The Ainu example provides insight into the popularity and motivations of documenting non-Western cultures during this period.

**Kellner, Corina**

[112]

*Chair*

**Kellner, Corina**

[112]

*Mummy Bundles Found at Huaca del Loro*

Huaca de Loro in Nasca is an important Wari colony in the Nasca region. Two recent field seasons at the site revealed new information on the relationship between Nasca and Wari during the Middle Horizon (650–1000 CE), such as a D-shaped temple and an associated compound indicative of Wari presence and evidence of habitation areas to the east. In this paper, I describe the burial practices of people interred near the D-shaped temple at Huaca del Loro. Four individuals buried in a seated, flexed position wrapped in layers of textiles and cotton batting (mummy bundles, or *fardos*) were encountered in the associated compound to the north. Elite individuals were usually treated in this way on the coast during the Middle Horizon. Two individuals were buried together in a small circular tomb marked by three posts, while two were outside this round structure and possibly associated with young camelid offerings. X-rays show that one individual buried outside the structure is a child, while the others are likely adults. Additionally, there is some indication that

one adult may have been a secondary burial. We hypothesize that the compounds associated with this D-shaped temple were devoted to ancestor worship.

Kelly, Kaley [72] see Peltzer, Summer

**Kelly, Mary Kate**

[186]

*Discussant*

Kelly, Mary Kate [93] see Zender, Marc

Kelly, Melinda [170] see Hitchcock, Robert

**Kelly, Robert (University of Wyoming), Madeline Mackie (Weber State University), Erick Robinson (Boise State University) and Spencer Pelton (Wyoming State Archaeologist's Office)**  
[170]

*A Precontact, Late Prehistoric Decline in the North American Indigenous Population*

Lawrence Todd has long contributed to “big picture” research. Here we discuss one instance of such research using a new radiocarbon database (Kelly et al. 2022, *American Antiquity*) of >104,000 ages to discuss population trends of North America's Indigenous population of the past 13,000 years. We focus on the late precontact period and corroborate, with a larger, higher quality dataset, the conclusion of Peros et al. (2010) that the Indigenous population reached a peak at ~AD 1150. We rule out archaeological sampling as the cause of this peak. We then examine spatial trends in the timing of the precontact peak, showing that some areas reached a peak prior to AD 1150 and others not until European contact. We discuss issues involved in accurately characterizing the timing of the precontact peak in different areas and suggest possible causes, all interlinked, of the apparent decline.

**Kelvin, Laura (University of Manitoba) and Lisa Rankin (Memorial University)**

[14]

*The Individual and Collective Journeys of Community-Based Archaeology Participants*

The success of community-based archaeology projects is often measured on a larger scale by things like research outputs and community development. During this conversation between archaeologists and community members previously hired as student field technicians, we are interested in discussing the impacts that working on community-based archaeology projects has had on the individual including their connections to the past and communities, their futures, and their well-being. We will also reflect on how the process of doing archaeology and developing understandings of the past are formed on both an individual scale as well as through networks of partnerships, mentorships, and friendships. The underlying theme of this conversation is that successful community-based projects are transformative not only for the community and archaeology but also for the individuals who participate in them.

**Kemmerlin, Aspen**

[211]

*Exploring the Possibilities of Active Learning through Collections-Based Archaeology Courses*

Recent trends in archaeological pedagogy include the adoption of active learning models as well as courses that incorporate community and public archaeology frameworks. These shifts have primarily been centered on archaeological field schools and on-campus excavations. In contrast, despite the growing concern over legacy and orphaned collections that contribute to the “curation crisis,” less attention has been placed on the

potential for inquiry-based learning in lab or collections-based courses, particularly at the undergraduate level. Utilizing ethnographic methods, this study examines undergraduate experiences in introductory archaeology courses at Georgia State University (GSU). Located in downtown Atlanta, GSU is one of the largest institutions of higher education in the USA and its student body is one of the most diverse. Comparing student experiences in a traditional lecture course with those of students enrolled in a hands-on project lab with a legacy collection of archaeological material curated at the university, this paper explores the potential of lab-based courses as sites of active learning and as models for more inclusive and accessible archaeological education at higher education institutions. This study indicates that there are significant opportunities to utilize legacy collections in experiential courses that provide students with the requisite skills for professional archaeology.

**Kemp, Brian****[48]***Discussant***Kemp, Kathryn****[43]**

*The Four Corners Potato: A Starch Granule Analysis of Ground Stone Artifacts from 5MT3873, Cortez, Colorado*  
New research suggests the utilization of a wild potato (*Solanum jamesii*) may have been an important resource in the arid West in general and particularly among Ancient Puebloan communities. This research tests for the role of *S. jamesii* in Ancient Puebloan societies by expanding upon the research goals and archaeological investigations of the Ladle House site (5MT3873), a multicomponent Basketmaker III, Pueblo I-II site in Cortez, Colorado, specifically focusing on the wealth of food processing activities which occurred in the Pueblo II kiva/pithouse structure. The tests outlined here employ starch granule analysis of ground stone artifacts to yield data regarding the plant processing and grinding activities at the site, specifically to test for the presence of the *S. jamesii* potato as a food source for the Pueblo II occupants of Ladle House. The synthesis of these investigations lends to a more complete understanding of the plant foods utilized. The starch grain analysis combined with new pollen analysis of seven ground stone tools identified one possible, but not definitive, starch grain from the *S. jamesii* potato as well as provided a more complete picture of the overall plant utilization found at the Ladle House.

**Kennedy, Jaime (University of Oregon)****[62]***Chair***Kennedy, Jason (Lyon College), Sergio Chavez (Central Michigan University) and Stanislava Chavez (Wayne State University)****[176]**

*Mapping Agricultural Terraces on the Copacabana Peninsula, Bolivia, Using Multispectral Satellite Imagery*  
The Copacabana Peninsula of Lake Titicaca, in modern Bolivia and Peru, is a landscape that has been heavily modified through the construction of stone terraces on the slopes facing the shores of Lake Titicaca and the intermontane valley systems. Previous research by the Yaya-Mama Archaeological Project has demonstrated that terrace construction began during the Early Horizon period and continued through the Late Horizon occupation and represents accretional construction organized by small-scale communities united through religious ceremony and heterarchical organization. The quality of their construction is attested by the fact that many of the ancient terraces are still in use by modern Aymara communities. However, the difficult terrain, sheer scale of ancient construction, and the abandonment or destruction of the ancient terraces have prevented archaeologists from accurate measurements of the terrace system. This poster presents the results of a preliminary study using digitally mapped extant terraces from high-resolution Google Earth imagery as training data for a support vector machine learning classification of multispectral satellite imagery collected from Planet Labs. The terrace systems identified in this classification are compared with

archaeological sites recorded by ground surveys to re-create networks of agricultural activity between the ancient communities of the Copacabana Peninsula.

**Kennedy, Ryan (Indiana University) and Koji Lau-Ozawa (Stanford University)**

**[208]**

*Culinary Innovation and Political Action in a Japanese Incarceration Camp*

During World War II, the US incarcerated 120,000 Japanese Americans in 10 incarceration camps, a process that uprooted lives, separated families, and ruptured economic and cultural networks. Incarceration also shaped the culinary practices of incarcerated individuals constrained by institutional oversight, the goals of camp administrators, racism, and other factors. We ask how studying food practices in one camp, the Gila River Incarceration Camp located on the Gila River Indian Community Reservation in Arizona, can inform understandings of this site and broader approaches to culinary archaeology. We combine faunal, material culture, and historical data to show how individual action and the labor of incarcerated individuals drove innovation and change in camp cuisine. Whereas historical accounts suggest incarcerated individuals had little choice in food in the camp's early days, we show that small actions, from illicit cooking to hunting small game, led to relaxed camp rules and reshaped camp cuisine. Beyond highlighting the politics of food in institutional contexts, we also show how innovation and change at multiple levels can spring from small-scale actions. Ultimately, we argue that understanding ingredients, dishes, and flavors must be balanced with consideration of how context-specific politics shape the choices and possibilities of food choices in the past.

Kennedy, Ryan [217] see Lau-Ozawa, Koji

Kennedy, Sarah [70] see Zhu, Ruoyu

Kennedy Thornton, Erin [243] see Kinney, Emily

**Kennett, Douglas (UC Santa Barbara) and Jeffrey Ross-Ibarra (UC Davis)**

**[223]**

*Maize Domestication and Dispersal in the Americas*

Dolores Piperno's work during the last four decades transformed our understanding of maize domestication and dispersal in the Americas. To honor this legacy we synthesize current genetic, paleoecological, and archaeological data regarding the early development of this globally important staple crop. Genetic evidence indicates initial domestication from teosinte (*Zea mays*, ssp. *parviglumis*) in the Balsas region of southwestern Mexico by ~9,000 years ago. Piperno's work demonstrated early cultivation in this region and rapid dispersal through Central and South America soon after domestication. The earliest cobs from the highlands of Oaxaca (6250 cal. BP) and Tehuacan (5300 cal. BP) are small (2–4 rows) and aDNA indicates the domestication syndrome was not fixed. Secondary improvement of maize occurred in South America and Mesoamerica by at least ~6700 and ~4300 cal. BP, respectively, with larger, multi-rowed varieties appearing when isotope studies show increasing consumption consistent with maize as a dietary staple. Genetic data suggest a subsequent hybridization with teosinte and a wave of dispersal from the highlands of Mesoamerica, as well as additional gene flow between continents during this interval.

Kennett, Douglas [48] see George, Richard

Kennett, Douglas [68] see Hixon, Sean

Kennett, Douglas [228] see Hoggarth, Julie

Kennett, Douglas [218] see Noe, Sarah

Kennett, Douglas [163] see Palacios, Horvey

Kennett, Douglas [17] see Prufer, Keith

**Kerchusky, Sarah (USACE NWP)****[27]***Ceramics from Zorropata, a Middle Horizon Las Trancas Habitation Site in Nasca, Peru*

Early in the Middle Horizon (c. AD 650–1000), the Wari Empire expanded from its Ayacucho homeland and established at least three colonies in the SNR: Pacheco, Pataraya, and Inkawasi in the northern valley of the Southern Nasca Region. Pacheco, located in the Nasca Valley, was a probable Wari administrative/ceremonial center. Additional Wari-affiliated sites, including Inkawasi, Pacapacari, and Lambrasniyoq, are present in the zone upriver from the Nasca valley system leading to Ayacucho. In the Las Trancas Valley just west of Zorropata, Huaca del Loro was the largest Middle Horizon site in the Nasca region. Previously interpreted as a local Nasca stronghold against Wari power, new research suggests that Huaca del Loro has architectural and artifactual traits that link it to the Wari heartland as a colony vital to imperial control. Within this regional context, this paper discusses ceramic vessels at Zorropata employing the typological classification of the assemblage and INAA analyses of polychrome finewares. Previous regional INAA studies observed a pattern of Early Intermediate period polychrome fineware production near the regional ceremonial center, Cahuachi. INAA results from Zorropata support previous clay source studies and indicate that local polychrome fineware ceramic production continued during the Middle Horizon despite Wari encroachment.

**Kerig, Tim (ROOTS centre of excellence CAU Kiel)****[142]***Wet-Preserved Living Spaces: Measuring Social Inequality from Circum-alpine and Central European Pile and Bog Dwellings*

Neolithic and Bronze Age wet preserved settlements are among the most fascinating sites of European prehistory. The circum-alpine sites (“pile-dwellings”) in particular attracted attention early on: because of their excellent preservation, they promised an immediate interpretative access to the past. What it had been like appeared immediately visible. Today, dendrochronological dating and the digitization and surveying of a reliable sample of floor plans enables a comparison of the differences in size of the individual buildings as well as between settlements. Here, the measurement of Gini coefficients is appropriate as a measure of inequality. In the paper, the correlations of Gini measurements with settlement duration will be especially examined. If the buildings’ additions and alterations have been made according to the life stages of the occupants—for example, houses may have grown with the number of their occupants—then higher Ginis should be correlated with longer occupancy duration. However, a maximum Gini, which represents a maximum inequality, would also be expected. The work is part of the GINI project and received also funding by the DFG under Germany’s excellence strategy EXC2150–390870439.

Kerneder-Gubala, Katarzyna [152] see Picin, Andrea

**Kessler, Nicholas (University of Arizona), Dakota Larrick (University of Arizona), Christopher Baisan (University of Arizona), Jeffery Dean (University of Arizona) and Ronald Towner (University of Arizona)****[48]***Prospects for Dendrochronology and Isotopic (<sup>14</sup>C) “Wiggle-Matching” in the Southwest/Northwest*

The contributions of tree-ring dating to American archaeology are well known but the benefits of the technique have largely been restricted to the uplands of the northern Southwest. While tree-ring dates have been successfully obtained from a handful of sites in the Southwest/Northwest, dendrochronology has been hampered in the region by low sample depth, a lack of spatial and temporal overlap between archaeological material and living-tree chronologies, and tree-growth patterns that can confound cross-matching. As a response to these challenges, recent and ongoing projects are beginning to show the high potential for radiocarbon-tree-ring (<sup>14</sup>C wiggle-matching) studies in the Southwest/Northwest. Wiggle-matching is enabling large-scale dendrochronological projects in Northern Mexico and the desert basins of southern and central Arizona that aim to build high-resolution tree-ring-based chronologies and expand the scope of

socioecological research in the region. This paper briefly reviews the history of dendrochronology in the Southwest/Northwest and then summarizes recent and ongoing research to explain how dendrochronology will continue making fundamental contributions in this area.

Kestle, Caleb [176] see Reid, David

Key, Alastair [88] see Cebeiro, Adela

**Khachemoune, Nour (Harvard College), Aurora Allshouse (Harvard University), Kristine Richter (Harvard University) and Christina Warinner (Harvard University)**  
[29]

*Animal Management of the Late Classic Maya at Copán, Honduras, Using Stable Isotope Analysis*

In the late nineteenth century, Harvard Peabody Museum excavations at the Classic Maya site of Copán, Honduras, identified a large deposit of animal bones in structure 10L-36, a platform located in the El Cementerio area of Copán's Late Classic Palace Complex. Primarily associated with the eighth–ninth-century CE reign of Yax Pabsaj, 10L-36 is thought to contain the food waste of Copán elites and those who attended the royal complex. To date, little research has been conducted on the platform contents, but the application of archaeological science techniques to the 10L-36 faunal assemblage has great potential to reveal key information about the composition and procurement of animal products in elite Late Classic Maya diets. Here we apply zooarchaeological, ZooMS, and stable isotope (C, N) analyses to deer, rabbit, fowl, and dog remains within the 10L-36 assemblage in order to understand which species were primarily targeted for consumption and to explore potential evidence for maize foddering and management of domesticated and non-domesticated species.

Kharinskii, Artur [53] see Lieverse, Angela

Khreisheh, Nada [232] see Liu, Cheng

Kidd, Fiona [86] see Ownby, Mary

Kidder, Tristram [121] see Su, Kai

**Kielhofer, Jennifer (Desert Research Institute), Jessica Tierney (University of Arizona), Joshua Reuther (University of Alaska, Fairbanks Museum of the North), Ben Potter (University of Alaska, Fairbanks) and Charles Holmes (University of Alaska, Fairbanks)**  
[15]

*Adding to the Paleoenvironmental Framework for Early Settlement of Interior Alaska: New Perspectives on Local Changes in Vegetation and Hydrology from Plant Wax N-Alkanes*

Many paleoenvironmental reconstructions from interior Alaska are based on pollen assemblages from lacustrine cores, which are sometimes challenging to relate directly to terrestrial conditions experienced by early human occupants. Here we use compound-specific stable isotope analysis of plant wax n-alkanes ( $\delta^{13}\text{C}_{\text{wax}}$  and  $\delta\text{D}_{\text{wax}}$  values) to infer local, site-specific conditions on spatial scales relevant to humans. This molecular approach contributes to the paleoenvironmental framework for human colonization and occupation of this region from the Late Glacial period (~14,000–11,000 cal yr BP) through the Holocene. Our  $\delta^{13}\text{C}_{\text{wax}}$  values become more positive from the Late Glacial to the Holocene, interpreted as heightened

evapotranspiration and/or evaporative stress on plants over time. Both  $\delta^{13}\text{C}_{\text{wax}}$  and  $\delta\text{D}_{\text{wax}}$  values are more tightly clustered during the Late Glacial than the Holocene, reflecting more consistent evaporative conditions across these sites during early human settlement. The Younger Dryas (12,900–11,700 cal yr BP) stands out as a period of lower evaporative stress and likely more vegetative homogeneity. These results indicate that several interior sites experienced large changes in effective moisture and evaporation over time, which may have played a larger role in floral and faunal shifts and human paleoecology than other environmental factors, such as temperature.

Kielhofer, Jennifer [127] see Henry, Edward

Kievman, Hayley [232] see Greenwald, Alexandra

Kilibarda, Zoran [240] see Marojevic, Vasilije

**Killick, David (University of Arizona)**

**[216]**

*Discussant*

Killick, David [166] see Chiu, Scarlett

Killick, David [166] see Stephens, Jay

**Kim, Alexander (Harvard University)**

**[244]**

*Discussant*

**[244]**

*Chair*

**Kim, Habeom (Independent Scholar) and Gyoung-Ah Lee (University of Oregon)**

**[220]**

*Comparing Population Dynamics in the Inland and the Coastal Regions during the Chulmun Period (10,000–3500 cal BP) in Korea*

This study examines the population dynamics during the Chulmun period (10,000–3500 cal BP) in Korea by analyzing paleoenvironmental proxies and  $^{14}\text{C}$  dates. It specifically focuses on the differences between the inland and the coastal regions concerning the period's population decline phase in the context of changing climatic conditions. The study suggests spatially differentiated patterns of population decline, where the magnitude of the decline in the coastal region was much less than that of the inland region during the population decline phase. This finding indicates that even if climate change played a key role in the process leading to the Chulmun's population decline phase, its impact was likely distinct between inland and coastal regions. The study discusses the long tradition of mobility-based subsistence strategy in coastal regions as a potential factor contributing to the detected regional differences in the population dynamics.

Kim, Heegeun [220] see Kwak, Seungki

Kim, Jinwoo [220] see Lee, Sungjoo

**Kim, Nam (University of Wisconsin, Madison)****[213]***Warfare and the Rise of Sociopolitical Complexity in Southeast Asia*

Archaeologists have long been interested in the development of social complexity and associated institutions of governance and political control. Within Southeast Asia, historical societies such as Angkor provide insights around premodern state societies. This paper deals with evidence from the late prehistoric era, addressing the role of coercive power and warfare in the emergence of early state-like institutions. The paper features data from the Co Loa site of present-day Vietnam. The ancient settlement provides a context of emergent sociopolitical complexity that was unprecedented in Southeast Asia, one that was shaped by both its geographic positioning as well as its interactions with societies of neighboring regions. How did leaders and rulers emerge, consolidating political power? How did societies develop novel forms of social organizations? How did militarism, coercive power, and organized violence contribute to these momentous changes? For the Co Loa case, political uses of violence, in combination with its disruptive effects, led to movements of people and large-scale shifts in social topographies on both local and regional levels. Ultimately, the paper considers not only how wars made states in Southeast Asia but also how states made use of war.

Kimbell, Jenni [82] see Lohse, Jon

**King, Adam (SC Institute of Archaeology and Anthropology), Sheldon Skaggs (Bronx Community College) and Terry Powis (Kennesaw State University)****[115]***A Granite Tool Producing Community on the Western Periphery of Pacbitun, Belize*

Between 2012 and 2014, a small mound was excavated on the periphery of the Pacbitun site, a medium-sized ancient Maya center located in the Belize River Valley of west-central Belize. That mound revealed a record of the production of 4,000 granite mano and metates dating to the Late Classic period. Since those excavations, a total of 22 similar mounds were recorded with 11 tested, confirming the existence of a granite tool production community. In this paper we present elements of the production process along with initial data on the geographic extent and dating of granite tool production at Pacbitun.

**King, Paul (Body Piercing Archive) and Franz Manni (Musee de l'Homme, Paris, France)****[226]***Resurrecting Piercing: Experimental Archaeology at a Global Scale*

Across continents, material evidence of body piercing jewelry abounds in the archaeological record. However, the varying procedures and processes of piercing, healing, and stretching these wounds for adornment remains unfamiliar to most archaeologists. This PowerPoint presentation discusses the early self-experimentations that led to the development of the Euro-American body piercing industry. From the late nineteenth throughout the twentieth century, shared personal correspondence, illustrations, and photographs document the adaptations, innovations, successes, and failures that came to coalesce a current community's collective knowledge. Understanding the processes of these secretive explorations provides insights into many of the cross-cultural practices of the past for which no clear records remain.

**King, Stacie (Indiana University)****[91]***Discussant***King, Stacie (Indiana University), Elizabeth Konwest (Indiana University) and Marijke Stoll (Indiana University)****[242]***Ancestors and the Power of Ruins in Nejapa and Tavela, Oaxaca*

There are numerous examples across the Nejapa region of Oaxaca that demonstrate the ways archaeological ruins retain meaning and power through time. This paper highlights ruins in the sites of Majaltepec, Los

Picachos, Cerro del Convento, Hacienda San José, and the modern town of Santa Ana Tavela to show how ruined, abandoned places—whether located in the remote wilderness or in the middle of urban areas—were never really considered to be unoccupied or uninhabited space. Based on research in Nejapa and Tavela, ruins are often considered to retain vibrancy and are (and were) typically treated respectfully and carefully. Some, like Los Picachos and Cerro del Convento, were charged with spiritual valency that required petitions, which were made visible in the form of people placing offerings at the site. Other long-abandoned buildings, including the Hacienda San José and a prominent house in contemporary Tavela, require avoidance even though their owners have long since passed away. Part of what makes all these ruins powerful and meaningful is their association with difficult historical events and with ancestors generally, which gives them spiritual potency.

**Kingrey, Haden (Washington State University), Geoffrey Smith (University of Nevada, Reno), Dennis Jenkins (University of Oregon), Lisa-Marie Shillito (Newcastle University) and John Blong (Washington State University)**

**[130]**

*Starch Grain Analysis of Late Pleistocene–Early Holocene Coprolites and Ground Stone from Two Northern Great Basin Rockshelters*

Recent macrobotanical analyses of late Pleistocene rockshelters in the Great Basin have shown that plants have always made up a portion of Indigenous peoples' diets. This is despite a relative lack of ground stone technology in these sites' Pleistocene strata. Ground stone technology increased in frequency by the early Holocene, signifying people's intensification and investment in seed gathering, processing, and consumption. Researchers have applied starch grain analyses of early Holocene ground stone in the Great Basin to establish the significance of roots, tubers, and other underground storage organs in addition to seeds. Both seeds and underground storage organs can be rich in carbohydrates which provided calories and helped people avoid protein poisoning, commonly known as "rabbit starvation." We present and interpret the results for starch grain analyses of coprolites from the Paisley Caves and ground stone from the Little Steamboat Point-I rockshelter. This research provides evidence that Great Basin people pursued carbohydrate-rich plant foods throughout the Pleistocene–Holocene Transition. Archaeologists' utilization of both macro- and microbotanical analyses provides researchers with more information to identify diets of the past and to help explain changes in foraging behavior and technology.

**Kinney, Emily (Washington State University) and Erin Kennedy Thornton (Washington State University)**

**[243]**

*Zooarchaeological Explorations at Aventura, Belize*

This paper presents the results of a broad zooarchaeological analysis conducted on remains recovered from a variety of contexts at the ancient Maya community of Aventura (Corozal, Belize). Because this is the first analysis of faunal remains from Aventura, it provides valuable information about life in the community including local ecology, subsistence, and household cooperation. The zooarchaeological remains from Aventura are also relevant to broader discussions of trade and sociopolitical relationships within the context of northern Belize, and may be compared to the evidence for economy and exchange indicated by other artifact classes. The Aventura faunal assemblage is also relevant to discussions of zooarchaeological taphonomy and recovery methods within the Maya lowlands. The assemblage was recovered during general excavation and also through selective use of soil flotation to recover microremains. The distribution of recovered fauna from across site contexts will thus be used to discuss faunal preservation and disposal patterns in this region of the Maya cultural area.

Kinney, Joseph [181] see Moriarty, Matthew

Kirby, Matthew [224] see Knell, Edward

Kirk, Jason [118] see Motta, Laura

Kirkpatrick, Glen [177] see Baley, Tyler

**Kirkpatrick, Molly (US Forest Service)**

**[145]**

*Assessing the Potential for a Late Pleistocene–Early Holocene Occupation at the Tahkenitch Landing Site (35DO130), Siuslaw National Forest, Oregon Dunes National Recreation Area*

While archaeologists hypothesize that early peoples initially migrated into the Americas along the Pacific coast, environmental changes associated with postglacial sea-level rise may have destroyed or obscured such early sites. In coastal areas currently above sea level, early sites are difficult to find due to terrestrial processes of landscape erosion and deep burial. To expand our knowledge of where other early sites might be located, we must work to first find late Pleistocene-aged terrestrial deposits. The Tahkenitch Landing site (35DO130), although currently lacking late Pleistocene-aged cultural components, is suspected to hold many of the stratigraphic qualities we should be seeking in the landscape of the Oregon coast. Geoarchaeological investigations at the Tahkenitch Landing site resulted in the identification of well-stratified late Pleistocene–early Holocene aged deposits. Radiocarbon dating of these deposits reveals a landscape history that span the period from ~42,000 to 3000 RYBP. Importantly, this study revealed the presence of a paleosol developed on aeolian sand buried beneath known midden deposits that dates from 13,111 to 10,112 RYBP. The discovery of these late Pleistocene-aged deposits reveals important stratigraphic targets for future archaeological exploration at the Tahkenitch Landing site and in the larger Oregon coast region.

Kisielinski, Caroline [15] see Norman, Lauren

Kisielinski, Caroline [88] see Potter, Bethany

Kissel, Emma [210] see Hanson, Tayla

Kistler, Logan [245] see Lin, Audrey

Kistler, Logan [71] see Loiselle, Hope

**Kitchel, Nathaniel (Dartmouth College)**

**[89]**

*Chair*

**Kitchel, Nathaniel (Dartmouth College)**

**[89]**

*The Late Pleistocene/Early Holocene Occupations of Northern New England: Evidence for Regional Resettlement?*

In the northern New England, the end of the Younger Dryas was marked by rapid warming and the transition from a landscape of open tundra and spruce parklands to closed canopy forest. The human groups that first settled in the region around 12.7 ka employed distinctive stone tool technologies that included fluted points. After the end of the Younger Dryas, human livelihoods undergo marked changes although the details of this transition are poorly resolved. It is clear, however, that social systems that had persisted for nearly 1,000 years transform evidenced by changes in mobility, settlement practices, and stone tool manufacturing techniques. This period is also marked by a nearly 1,500-year-long gap in archaeological <sup>14</sup>C dates. Here I

discuss the current state of research into the human occupations of the Pleistocene/Holocene transition in northern New England outlining the, albeit limited, evidence suggesting the appearance of “Agate Basin Variant” points in the region represents the resettlement of a largely depopulated area.

Kitchel, Nathaniel [177] see Alperstein, Jonathan  
Kitchel, Nathaniel [55] see Casana, Jesse

Kitchen, Andrew [203] see Thomas, Ariane

Kitteringham, Lia [127] see Henry, Edward

Kiyasbek, Galymzhan [141] see Dupuy, Paula

**Klarich, Elizabeth (Smith College) and Elizabeth Arkush (University of Pittsburgh)**  
**[22]**

*Breathtaking Landscapes, Big Questions, and Fabulous Feasts: Celebrating the Contributions of Dr. Charles Stanish*  
In this introductory paper, we celebrate Dr. Stanish’s impact from both personal and professional angles. We review some of the major contributions of Dr. Stanish’s career over four immensely productive decades, including long-term research projects in several regions and “big ideas” that have significantly influenced Andean archaeology. We also especially take the opportunity to share our personal experiences working with him, from the Lake Titicaca Basin to the Field Museum of Natural History, the University of California, Los Angeles campus, and beyond. Over those years, Stanish’s impact as a mentor, scholar and friend was profound and his influence continuing. Here we take a whirlwind tour of the lessons we have learned from his unique combination of deep knowledge and dedication, generosity and enthusiasm, creativity, and humor.

**Klarich, Elizabeth (Smith College)**  
**[164]**

*Chair*

Klarich, Elizabeth [164] see Smith, Scott

Klassen, Sarah [109] see Fletcher, Roland

Klassen, Stanley [224] see Danielson, Andrew

**Klehm, Carla (University of Arkansas)**  
**[169]**

*Discussant*

**Klehm, Carla (University of Arkansas), V. Camille Westmont (Sewanee: The University of the South) and Kaitlyn Davis (University of Colorado, Boulder)**  
**[16]**

*Remote Sensing and Dynamic, Unique Landscape Perspectives*

Remote sensing has been fundamental since the establishment of landscape archaeology, from capturing site layout to aiding in the synthesis of human-environmental relationships. Geospatial technology and its analytical software continue to advance at an accelerated pace and are considered almost integral to

archaeological research. Critical reflections by scholars about the data acquisition, analysis, and visualization remind archaeologists that remote sensing data is not neutral, even when sensors are passive. For example, decisions about processing directly tie to what we see as do features of “significance” and the scales archaeologists use to derive their conclusions. This paper considers how remote sensing, especially very high-resolution UAV and satellite-derived imagery, provides an exceptional and expressive perspective about the decisions and risks human societies engage with over time. We examine active (lidar) and passive (RGB, multispectral) data derived from case studies from the historical US Southeast, precolonial southern Africa, and precontact US Southwest to take a comparative look at the dynamic and uniqueness of 2.5/3D data. We discuss how remote sensing, as a methodological tool, can be used as a palimpsest with quantitative and qualitative attributes to conceptualize connectedness of people to place—not just what happens where, but why and why then.

Kleist, Mari [173] see Walls, Matthew

**Klembara, Nathan (Binghamton University)**

[132]

*The Position of Archaeology within the Academic Disciplines: Contemporary Views from Practicing Archaeologists*

Archaeology has long occupied a fruitful and yet uneasy position within academia in the United States. Anthropological archaeology has long drawn methods and theories from the natural sciences, social sciences, and the humanities, which in many ways has expanded the interpretive and analytical possibilities of the discipline. However, it has also caused much debate and epistemic anxiety over what archaeology actually “is” and where it fits within the classificatory nexus of the academic disciplines. This ultimately leads to questions such as: What should the constitutive goals of archaeology be? Which philosophies of science should we look toward to guide our research? Is there a “proper” archaeology, and what might that look like? Drawing on both quantitative survey data and a series of ethnographic interviews with practicing and publishing archaeologists, in this paper I present the current range of thoughts on these questions within contemporary archaeology. In doing so, I highlight the diverse and complex, and at times messy and contradictory, views that archaeologists hold about the epistemic status and positionality of our discipline, and how this impacts the knowledge we produce about the past.

**Klesner, Catherine (Institute for the Study of the Ancient World, New York University)**

[141]

*Chair*

**Klesner, Catherine (Institute for the Study of the Ancient World, New York University)**

[141]

*Early Islamic Glazed Ceramics from Bukhara and Tashkent: An Archaeometric Analysis*

This paper presents the results of the archaeometric analysis of 150 early Islamic style glazed ceramics from Central Asia. The glazed ceramics, introduced to the region in the ninth century CE, served as important cultural markers and demonstrated the intentional affiliation that the residents in Mā Warā' an-Nahr developed with the wider Islamic World. While an increase in research in the past 10 years has characterized the production of Islamic glazed ceramics, some of the largest historical cities in Central Asia have yet to have any systematic study of their glazed ceramics, including the Samanid capital Bukhara. Here I present the study of “Samanid”- and “Karakhanid”-style glaze ceramics recovered from the cities of Bukhara, Paykend, Tashkent, and Taraz. Through compositional analysis by neutron activation analysis (NAA) and complementary technological analysis by electron microscopy, I characterize the provenance of finely decorated glazed pottery from these centers to determine the scale of local production and technological developments during the Samanid and Karakhanid period. This research provides key insights into the extant of “Samanid”- and “Karakhanid”-style slipware ceramics in the eastern Islamic World, and addresses questions about the degree of technological similarity between these major production centers.

**Klessig, Barbara (Humboldt State University; University of Exeter)****[196]***Chair***Klessig, Barbara (Humboldt State University; University of Exeter)****[196]**

*Textiles, Tools, and Trepidation: Experiments in Creating Bone and Antler Tools Used in the Production of Textiles*

Tools used in the creation of textiles can be made of numerous materials, including stone, clay, metal, wood, bone, and antler, just to name a few. Numerous experiments in creating tools, such as spindle whorls, loom weights, needles, combs, and weaving battens have been carried out at living history centers, conferences, and other events with several material types being researched. This poster looks at the process of collecting, cleaning, and prepping the material for tool creation. The collection of bone and antler, degreasing and cleaning of the bone, and the reducing of bone and antler to workable size and proportion are part of the process that has not been examined to the extent that other parts of the process(es) have. When working through this process a number of questions came to mind, including would the textile producer have gone through this process herself or would she have had someone prepare and/or create these particular material types for her? If she was creating the tools from beginning to end, what process(es) was used in the cleaning and prepping of the bone and antler? Inquisitive minds want to know, including myself, with this poster being a preliminary venture into answering these questions.

**Klokler, Daniela (Universidade Federal de Sergipe [UFS]), Bruno Silva (Universidade Federal de Sergipe [UFS]) and Beatriz Trindade (Universidade Federal de Sergipe [UFS])****[55]***Archaeogaming and Shell Mounds*

Archaeogaming is a new found topic in archaeological trends. The publication of the homonymous title by Andrew Reinhart, in 2019, seems to have swung ajar a door that lots of us have been carefully creeping into: the prospect of uniting archaeological theory, methods, and practice with the enjoyment of possible worlds. From that standpoint, we present some notes from an archaeological gameplay experience. This experience was part of a research project that aimed at gameplay as a form of scientific dissemination for the general public, and a pedagogical tool for archaeology classes. The game chosen was *Sambaquis*, released in 2019 by ARISE, a Brazilian study group on archaeology and electronic media. The participants were Bruno S. R. da Silva, project coordinator, Beatriz Trindade, associated student, and Daniela M. Klökler, archaeological specialist in Brazilian shell mounds. Our goal was to test the waters of such an encounter, as a means of expanding our abilities to communicate with the general public, and to contribute with the knowledge we so passionately work to create. The results were fruitful and showed us that archaeological gameplay can be a symmetrical locus of experience, demanding the expertise of a professional in both fields—archaeology and entertainment.

Klotsko, Shannon [113] see Braje, Todd

Klotsko, Shannon [62] see Futton, James

**Knapp, Gregory (University of Texas, Austin)****[54]***Discussant***Knell, Edward (California State University, Fullerton), Matthew Kirby (California State University, Fullerton), Jan Taylor (Bowers Museum, Santa Ana, California) and Albert Garcia (GIS Services, Orange County, California)****[224]***A Model and Test of Paleoindian Land Use at Pluvial Lake Mojave in California's Mojave Desert*

Fluctuations in the extent and productivity of wetland habitat influenced Great Basin Paleoindian land use strategies. Paleoindians responded to resource fluctuations using a "wetland transient" strategy represented

by frequent moves between pluvial lakes, or a “wetland stable” strategy characterized by comparatively long stays at resource hotspots. To assess the optimal land use strategy for pluvial Lake Mojave, we build an optimal foraging theory inspired model that predicts Paleoindians at Lake Mojave optimally selected a wetland stable strategy when the patch-rank (comparatively extensive wetland habitat) was high and a wetland transient strategy when the patch-rank (comparatively little wetland habitat) was low. We test these expectations using data—presence/absence of midden and residential structures and four lithic ratios—from 13 Paleoindian sites around Silver Lake, one of two playa lakes that formed pluvial Lake Mojave. We conclude that Silver Lake was a low-ranked resource patch during Paleoindian times and thus optimally exploited using a wetland transient strategy, which the archaeological evidence supports. The paper concludes by comparing this result to later period sites around Silver Lake and other Great Basin pluvial lakes to assess whether the Paleoindian land use strategy around Silver Lake is anomalous or part of a broader trend.

**Knobloch, Patricia (Institute of Andean Studies), Milosz Giersz (University of Warsaw, Poland), Brandi MacDonald (Archaeometry Lab at MURR) and Michael Glascock (University of Missouri Research Reactor)**

[139]

*Partnering for Power: Castillo de Huarmey Relations with the Wari*

By Middle Horizon Epoch 2 (AD 800–850) the Wari polity was a generation old and assumed to reflect a complex hegemony based on ruins of a cosmopolitan capital in the Ayacucho-Huanta valley and artifact associations among ethnically distinct communities throughout the Andes. The complexity includes shared artistic expression in pottery styles as well as installations of dominance such as Pikillacta and incursions such as Jincamocco’s changed settlement patterns. Castillo de Huarmey’s remains exemplify a complex relationship within Wari hegemony. One means of studying this relationship is presented through comparing pastes of two ceramic samples using instrumental neutron activation analysis. One sample from Wari’s heartland came from two university collections: (1) 103 sherds from the Peabody Museum of Natural History, Yale University, were submitted to the University of Missouri Research Reactor (MURR); (2) 119 sherds from Phoebe A. Hearst Museum, UC-Berkeley to the Lawrence Berkeley National Laboratory (LBNL). The second sample was 77 sherds from Castillo de Huarmey that were submitted to MURR. Michael Glascock and Brandi MacDonald completed the MURR analyses in 2017–2018. Frank Asaro, Helen Michel, and Elizabeth Holtzman completed the LBNL analysis in 1977. Results suggest that Wari initiated contact and supplemented a relationship that strengthened Huarmey’s authority.

Knudsen, Dan [111] see Thomas, Jayne-Leigh

Knudson, Kelly [29] see de la Rosa-Martinez, Marcos  
Knudson, Kelly [134] see Hall, Sarah

**Ko, Ilhong (Seoul National University Asia Center [SNUAC])**

[220]

*Social Interactions along Korea’s Southern Coastline: The Legacy of the Protohistoric Port of Neukdo (ca. Second Century BCE to First Century CE)*

The southern coastline of the Korean Peninsula acted as a stage for maritime interactions from as early as the Neolithic. However, with the establishment of an international port of trade at Neukdo Island, the range of the maritime network in operation along Korea’s southern coastline expanded to areas as far away as Primorsky Krai in Russia and China’s Central Plains. Research on Neukdo Island has mainly focused on the movements and connections that took place at this port during its heyday, dating from the second century BCE to the first century CE. This paper aims to explore the history of the maritime network in which Neukdo Island functioned as a key node by comparing the distribution of foreign objects—of those dating to the period prior to, and after the establishment of Neukdo—that have been found in southern Korea. Preliminary results suggest that although the international trade port itself was only in existence for around

three centuries, the legacy of the maritime network formed by the port's existence remained strong and played a crucial role in shaping the nature of social and economic interactions in the East Asian world.

Kocer, Jacqueline [48] see Conrad, Cyler

Koch, Sandra [245] see Welker, Martin

**Koch-Michael, Leah**

[178]

*A Comparison of Mesolithic Danish Logboats and Pacific Northwest Canoes*

Background: Pacific Northwest ethnographic information about canoe usage and building techniques can be compared to the many Danish mesolithic logboats currently in the archaeological record. Both maritime cultures created watercraft from single tree trunks. There are no surviving precontact Pacific Northwest canoes, and many Danish mesolithic logboats. Conversely, there is no ethnographic information for Danish mesolithic maritime cultures, whereas the Pacific Northwest has postcontact ethnographies and historical sources showing a dynamic but continuous use of single-trunk boat technology. Method: A comparison of single-trunk watercraft technology, environmental similarities, and prehistoric population patterns in similar maritime cultures. Watercraft technology ties together environment and social organization in a way few other artifacts do, becoming Hein Bjerck's human-boat-machine. Results: Single-trunk watercraft technology was developed in the face of similar environmental pressures and resources, and the comparison illuminates technological convergence between temporally and geographically distant cultures. Conclusion: An adaptation to and reliance on single-trunk maritime watercraft contributed to the formation of decentralised societies with semipermanent settlement patterns, and resource management, allowing stable population growth.

**Koehnen, Fiona and Kelly Bush (Equinox Research and Consulting International Inc.)**

[149]

*Introducing Archaeological Methods to Elementary School–Age Students: Outreach Contributing as a Solution to the CRM Labor Crisis*

Introducing younger students to CRM through the fun of archaeological method we are reclaiming the narrative around CRM as a great career choice and we are starting early. Five to 15 year olds are particularly good at engaging with the hands on nature of the study of material culture. Supporting existing curriculum goals including the *Since Time Immemorial: Tribal Sovereignty in Washington State* (2018), is a natural fit for archaeological methods. We are presenting and sharing proven hands on activities used inside and outside of classrooms to help introduce kids early and repeatedly to this great career. Using STEM as inspiration for archaeological activities we will share several techniques that can be used with minor changes at more than one grade level to support the Washington State curriculum. The goal is to both provide another format to teach the scientific method, use technology, apply to engineering problems and use math while reinforcing CRM/Archaeology as a viable and desired career option.

**Koenig, Charles (University of Wyoming)**

[130]

*Chair*

**Koenig, Charles (University of Wyoming), Leslie Bush (Macrobotanical Analysis), J. Kevin Hanselka (Texas Department of Transportation), Chase Mahan (University of Wyoming) and Amanda Castañeda (Wyoming State Historic Preservation Office)**

[130]

*Early Holocene Earth Oven Cooking in Southwest Texas*

Eagle Cave (41VV167) is a dry rockshelter in the Lower Pecos Canyonlands of Texas containing a 13,000-year record of hunter-gatherer lifeways. Beginning around 10,500 cal BP, Lower Pecos foragers began

constructing earth ovens to bake plants—and likely animals—signaling a major shift in subsistence. Alston Thoms refers to this transition as the “carbohydrate revolution,” and researchers in Texas have argued the inclusion of desert succulents in the diet shortly after the Pleistocene/Holocene transition signals economic intensification linked to population growth. However, most earth ovens in Texas date to the late Holocene, and most early Holocene oven sites are open air and lack the organic preservation to evaluate how earth oven cooking, and forager diets more broadly, shifted in response to changes in population size and climate. Using archaeological data collected during recent excavations at Eagle Cave, this presentation examines how earth oven use fluctuated in relation to population and climate from ca. 10,500–5500 cal BP while also considering how social factors such as aggregations or feasting may have contributed to subsistence intensification.

Koenig, Charles [241] see Castañeda, Amanda

**Kohler, Tim (WSU/SFI/CCAC)**

[1]

*Discussant*

[142]

*Chair*

**Kohler, Tim (WSU/SFI/CCAC) and Amy Bogaard (University of Oxford)**

[142]

*Summary of Results to Date in Light of Existing Models for the Development of Wealth Inequality*

In this paper we summarize key results from the previous papers in this symposium, all of which report preliminary findings of the Global Dynamics of Wealth Inequality (GINI) Project. As Lauren Bacall sings in “To Have and Have Not”: how little we know! Archaeologists have assembled the grand outlines of increasing wealth inequality in a few of the world’s best-known regions, but huge dark areas remain away from those selected lamp posts. Moreover, we should not assume that even in these better-known regions the processes of increasing wealth inequality are monotonic. Outstanding questions that we begin to address here include how much do Giniis respond to various technological and social innovations? (These vary from region to region, but would often include increased importance of cultivated cereals, draft animals, development of institutional arrangements protecting differential wealth such as the state, and the increasing importance of enslaved labor). How general is social resistance to development of inequality, and can we differentiate this from low inequality simply due to low surplus? Do Giniis respond differently to development of draft and portage domesticates? And so forth. This paper is intended to summarize the results to be examined and critiqued by the discussants.

**Kohut, Lauren (Winthrop University)**

[73]

*Farming Landscapes under Stress: Modeling Access to Pastures and Fields in the Late Intermediate Period Colca Valley (1100–1450 CE, Arequipa, Peru)*

The Late Intermediate period (1100–1450 CE) in the highland Andes of South America has long been characterized by warfare and climate stress. These conditions almost certainly had profound impacts on ancient farmers. It has been suggested that climate changes compelled farmers to diversify by cultivating crops in a greater range of ecological zones or by combining cultivation with herding of native camelids (llamas and alpacas). At the same time, increased risk of warfare may have constrained farmers, encouraging more intensive use of lands and resources proximate to hillforts. Here, remote sensing and geospatial modeling are combined with local ethnographic and historic data on farming and traditional ecological knowledge to model the distribution of farming ecotopes and their articulation with Late Intermediate period settlement patterns in the Colca Valley. Prior work in the valley, including archaeological survey of hillforts and local paleoclimate reconstructions, attest to local experiences of conflict and prolonged drought. The results suggest that farmers across the valley responded by prioritizing access to a diversity of resources but developed wildly

different defensive strategies to secure access to those resources. These findings provide insights into human adaptability in the face of shifting social and environmental contexts.

**Kolata, Alan (University of Chicago)**

[61]

*Discussant*

**Kolb, Charles (National Endowment for the Humanities [retired])**

[216]

*Chair*

**Kolb, Charles (National Endowment for the Humanities [retired]), Kostalena Michelaki (Arizona State University) and Sandra Lopez Varela (UNAM)**

[216]

*Introduction: Ceramics and Archaeological Sciences*

In any academic discipline, the sociology of knowledge, involving the creation and sustenance of networks, is often as important as the knowledge itself to discover and disseminate scientific information. This session celebrates and reveals the critical role of Frederick R. Matson (†), Charles C. Kolb, and Louana M. Lackey (†) in creating and sustaining the knowledge of ceramic studies for three and a half decades. Through their work in writing, reviewing, and fostering an international and interdisciplinary climate of interaction, Kolb and Lackey initially, then Kolb on his own, and finally with the help of López Varela and Michelaki, have brought together more than 300 scholars, practitioners, and students from at least 15 nations in annual meetings at the American Anthropological Association. In 2023, Ceramics and Archaeological Sciences is looking forward to continuing this long tradition at the SAA by presenting research from around the world, at various scales, using various methods and theoretical approaches that remain true to potters and their pots. The Society for Archaeological Sciences, a vibrant association, supports this new future-looking venture standing up strongly for applying science and technology to serve humankind through archaeological practice.

**Kolhatkar, Manek**

[132]

*CRM Workers Are Key to Changing Archaeology: Epistemic Lessons from Quebecois Practitioners*

Cultural resource management (CRM) archaeology is the most common way for archaeologists to practice their craft in North America. As the field's major workforce, CRM workers occupy a strategic position to change the discipline. In this presentation, I argue that an epistemic injustice framework can help CRM workers organize by participating in the collective creation of knowledge regarding their practice. Epistemic injustice places knowledge within power struggles to explain how various power dynamics come into play to exclude various groups from participating into the collective construction of knowledge about the world, how this exclusion works at subverting people's development and ability to act, and how epistemic frictions are mandatory to enacting political change. To illustrate my point, I draw from my work as an organizer among Quebecois CRM workers between 2017 and 2020 to show how they started organizing by repossessing their right to collectively voice their concerns about their practice, as well as their right to be heard; how this led to epistemic frictions with some of their employers; how these frictions led them to create their first sector-wide archaeological union, one of the first in Canada. I conclude with a general view of the challenges that lie ahead.

**Kollias, G. Van (Brandeis University)**

[64]

*Reorienting Frontiers and Borderlands: Recent Research on the Usumacinta River*

Frontiers and borderlands are often conceptualized as places of precarity, where uncertainty characterizes

communities outside the purview of authority. In contrast, borders evoke the presence of a reinforced authority where physical and political structures have been put in place to fortify a territory. However, these approaches often simplify or distill complex social realities which focus on inside-out perspectives of state authority and political structures in the ancient past. This paper explores frontiers and borders as places for the production and expansion of community, identity, and interaction. Foregrounding the frontier as an active place of political agency this paper asks how we may reorient our interpretations of ancient territorial politics and their dominions. Investigating the interstices of Lacanja Tzeltal and Piedras Negras along the Usumacinta River provides a unique opportunity to contrast the effects of conflict and political machinations among Ancient Maya Royal courts on the countrysides, frontiers, and borders of their territories. Drawing from archaeological excavation, survey, and lidar-derived landscape modeling this discussion posits how we may investigate variation in settlement patterning and material culture in the interstices of Lacanja Tzeltal and El Cayo, Chiapas, Mexico, two of the region's major antagonists in the ancient past.

Komšo, Darko [47] see Ahern, James  
 Komšo, Darko [47] see Becker, Rory  
 Komšo, Darko [47] see Jankovic, Ivor

**Konwest, Elizabeth (Indiana University, Bloomington) and Marijke Stoll (Indiana University, Bloomington)**  
**[242]**

*Ruins in the Daily Life of San Antonio La Baeza from the Prehispanic Past to the Modern Day*

What role do ruins play in the lives of descendant peoples? Surrounding the small mountain pueblo of San Antonio La Baeza are numerous ruins dating to different time periods. For example, below the modern pueblo are large, deep rockshelters that have been occupied from the Late Formative up until today and are covered in rock paintings. Dispersed across the ridgeline of the nearby Cerro San Antonio lies the monumental archaeological site of prehispanic La Baeza. Directly above the pueblo is Cerro El Gallo, another hill with archaeological features whose name is based on mythic stories. The pueblo possesses eighteenth-century colonial documents for purchase of the land where the modern settlement lies. Finally, the oldest pueblo residents were born and baptized in the nearby Pueblo Viejo. Past and present peoples live among these remnants of their ancestors and interact with them on a daily basis. This paper investigates the role of ruins in the constitution of the San Antonio La Baeza community from the Late Formative period to the modern day.

Konwest, Elizabeth [242] see King, Stacie

**Kooiman, Susan (Southern Illinois University, Edwardsville) and Rebecca Albert (Santa Barbara Museum of Natural History)**  
**[140]**

*Ancient Indigenous Cuisine: Multiproxy Investigations of Food Choice and Cooking*

The application of pottery function analysis alongside analysis of adhered food residues on ancient pottery offers new insights into past foodstuff selection and cooking methods, aka cuisine. Identification of phytoliths and starches present in carbonized food residues provides evidence of specific plant species processed in ceramic cooking vessels, while modes of cooking can be inferred from use-alteration pottery analysis, specifically the characterization of carbonized food residue patterns on interior vessel surfaces. These approaches were collaboratively applied to pottery collections from various Middle and Late Woodland sites in the Northern Great Lakes of North America, revealing diachronic variation in exploitation of plant resources and changing styles of food preparation over time. When these data are assessed in context with chemical food residue analyses, macrobotanical and faunal remains, and ethnographic and ethnohistoric information, additional insights into regional culinary traditions are revealed. Collectively, this study serves as the basis of a model for investigating ancient cuisine in contexts from around the world.

**Koon, Hannah (University of Bradford) and Mandi Curtis (University of Bradford)****[134]**

*Changing Diets: Using Stable Isotopic Micro-sampling Approaches to Explore Dietary Changes throughout Life*  
Isotope analysis of bulk carbon and nitrogen from tooth dentine and bone collagen are now commonly used in studies of dietary reconstruction from past populations. Teeth do not remodel once formed, so bulk dentine values provide an “average” dietary signal from the few years of childhood when the tooth was formed. Bones, on the other hand, continue to remodel throughout life. Therefore, a bulk bone collagen signal might represent decades or even a lifetime average. The research presented here is focused on refining micro-sampling techniques in both teeth and bone to allow for greater temporal resolution in dietary isotope analysis. Initial results from modern and archaeological human teeth and modern animal bones with known grazing histories suggest that these high-resolution methods can detect changes in dietary input that are masked by more traditional sampling approaches. Our sampling approach to teeth detected peaks in the incremental dentine isotope profiles suggestive of nutritional stress and seasonal dietary shifts. Our histologically informed micro-sampling method of animal bones showed site specific differences in isotope values and also provided the ability to detect shifts in husbandry practices/location during the lifespan of the animal.

Koons, Michele [137] see Baxter, Erin

Koperkiewicz, Arkadiusz [30] see Gaddis, Katherine

**Kopperl, Robert (Willamette Cultural Resources Associates)****[107]***Moderator***Kopperl, Robert (Willamette Cultural Resources Associates) and Eleni Petrou (University of Washington)****[122]**

*Pacific Herring: Methodological and Interpretive Considerations of a Keystone Species for Zooarchaeological Analyses*  
Bones of the Pacific herring, abundant in many Pacific Northwest shell middens, are increasingly recognized as important indicators of past complex foodwebs and the ecosystemic role of humans. For decades, zooarchaeologists interpreted the presence of herring bones at these sites as reflecting indigenous fishing during a limited late winter-early spring season based on the conventional wisdom of commercial herring fisheries and studies with limited time-depth by fisheries biologists. Recent increasingly sophisticated studies of the Pacific herring genome paint a much richer mosaic of variability for herring spawning behavior across space and deeper time, in both a cyclical annular sense and an absolute diachronic Holocene trajectory. We review some methodological considerations at a macroscopic scale for using archaeological herring bones for such studies, and the interpretive potential of resulting ancient DNA analyses. A recent aDNA study of archaeological herring bones from several southern Salish Sea assemblages provides a case study. Methodological considerations at a macroscopic scale include construction of diachronic analytic units with good chronological control, and sampling appropriate skeletal elements for aDNA extraction at the molecular scale. Interpretive considerations include recognition of hypothetical causes of change in genomic composition of herring represented in a particular archaeological component.

Kopperl, Robert [37] see Taylor, Amanda

**Kornfeld, Marcel (PiRL—University of Wyoming)****[159]**

*Developing Methods of Hunter-Gatherer Archaeology in Western North America: 1983–2022 (or, from Map-O-Matics to Total Stations)*

Although not the Paleolithic in the classic sense of the word, prehistory of North American western Plains and Rocky Mountains is a study of stone tool–using hunter-gatherers. Excavation techniques changed radically

over the past 70 years perhaps stimulated by theoretical concerns and questions. In this presentation we briefly review the earlier parts of this period of developing methods, focusing on the last 20 years. Today's cutting edge techniques using digital instruments, preliminary in-field recording, and analysis of recovered artifacts have resulted in creating an extremely high-resolution archaeological record unavailable to earlier investigators. Results of several site databases are highlighted and evaluated, illustrating drawbacks, benefits, and possible future directions.

Kornfeld, Marcel [229] see Lynch, Elizabeth

Koropecykj, Damian [30] see Bassett, Hayden

Korzow Richter, Kristine [71] see Millien, Sebastian

Kosby, Luke [181] see Moriarty, Matthew

**Kosiba, Steve (University of Texas, San Antonio)  
[164]**

*To Build a Mountain and Raise a People: Making and Inhabiting an Inka God's House (Wanakawre, Cuzco, Peru)*

Over the past three decades, anthropological archaeologists have engaged in a vibrant interdisciplinary conversation about the production of space. Rejecting earlier viewpoints that saw social space as the passive product of cultural worldview or political strategy, archaeologists developed innovative approaches to document how space actively shapes and is shaped by human activity, a dialectic often called "spatial practice." Jerry Moore, in particular, has advanced a viewpoint that moves beyond the binaries of this dialectic to ground our understanding of social space in the materiality of the physical environment. Moore's work on the most common of built forms—the dwelling—defines space as a never-ending material process. His research centers on the materials that shape social life: the logs that manifest cultural concepts of permanency and home; the adobe bricks that are the stuff of expert knowledge and skill; the cane that is essential to the reverberation of sound and the circulation of ideas within village communities. In this paper, I celebrate Moore's contributions by applying his analytical and methodological lenses to the mountain temple of Wanakawre (Cuzco, Peru), arguing that Inka ideas of "home" were in part manifested through practices of gathering, sustaining, and recycling the materials of a deity's house.

Koski-Karell, Daniel [42] see Sabo, Allison

Koster, Lucy [53] see Schulting, Rick

**Kosyk, Katrina (McGill University)  
[247]**

*Music and Sound Practices in the Puebla-Tlaxcala Valley*

More than a means for communication, sound, and music contributed to the formation of identities in the Puebla-Tlaxcala valley during the Late Postclassic to early colonial period. In particular, sonic assemblages contain multisensorial data that can be used to identify how knowledge and musical practices are shared among communities. These communities used sound and music in all forms of activities, including rituals and aesthetics. Yet, little is known about the composition of these assemblages and how they contributed to a broader sensorial experience unique to these communities. To better understand how communities may have shared musical knowledge in the Puebla-Tlaxcala valley, I turn to archaeological collections of three of the four *señoríos* that once formed the capital of Tlaxcallan in the late prehispanic period. Additionally, I discuss how ancient musical instruments continue to play a role in ritual performances of contemporary and remote communities of the Sierra Norte de Puebla.

Kottermair, Maria [49] see Peterson, John

**Kovacevich, Brigitte (University of Central Florida)**

[83]

*Discussant*

Kovacevich, Brigitte [43] see Batres, Kimberly

Kovacevich, Brigitte [100] see Clark, Jessica

**Kovach, Tanner (University of Connecticut)**

[56]

*Chair*

**Kovach, Tanner (University of Connecticut), Yannick Raczynski-Henk (University of Leiden), Ellery Frahm (Yale University), Artur Petrosyan (Institute of Archaeology and Ethnography, NAS RA) and Daniel Adler (University of Connecticut)**

[56]

*Organization of Technology at Solak-I, an Upper Paleolithic Open-Air Site in the Armenian Highlands*

Solak-I is an Upper Paleolithic open-air site located in central Armenia discovered by the Kotayk Survey Project. An obsidian-rich lithic assemblage totaling about 2,500 artifacts was recovered from six stratified horizons and subjected to techno-typological attribute analysis. Core reduction appears predominantly aimed at the production of bladelets from formal and informal cores. Reduction was primarily unidirectional, but final stages of bladelet core use-life were often characterized by bidirectional knapping to extend the use of near exhausted or ruined cores. The toolkit is likewise characterized by tools made on bladelet and small blade blanks, predominantly in the form of laterally retouched pieces. Occupation intensity indexes suggest little early-stage reduction, high retouch frequency, and low reduction intensity, pointing to a pattern of high mobility and curation and decreased occupation duration. Obsidian artifact sourcing shows a similar pattern, with high levels of local raw material procurement and intermittent transport of raw material over distances of at least 250 km. The metric and technological attributes of Solak-I are compared to other published Upper Paleolithic sites in the Armenian Highlands to assess the place of this site in the regional sequence, adding to our understanding of *Homo sapiens* behavior during the Late Pleistocene in Armenia.

**Kovacik, Peter (Boston University)**

[215]

*Living on the Edge: Uncovering Quotidian Life of the Eighteenth-Century Land Grant Community of San Miguel de Carnué*

Following the approval of their application for a community land grant east of Albuquerque in 1763, several New Mexico families of diverse origin ventured into the Tijeras Canyon in hopes of improving their status by managing lands in this colonial buffer zone. The constant threat of Apache raids, however, meant the initial plaza-centered settlement of San Miguel de Carnué (LA 12924) lasted only few years (1763–1771), leaving minimal historical evidence of life in the village. This paper explores interactions between the past residents of San Miguel de Carnué and the surrounding environment, using paleoethnobotanical samples collected during the 2022 New Mexico State University (NMSU) archaeological field school. Because the paleoethnobotanical remains resulted from routine activities such as wood/fuel harvesting and food preparation/consumption, they shed light on several aspects of quotidian life at this eighteenth-century community that are otherwise lacking in the historical record.

**Kowalski, Jessica (Arkansas Archeological Survey)**

[169]

*From Bluffs to Floodplain: A Spatial Approach to Mississippian Communities in the Ozarks of Arkansas*

Mississippian (ca. AD 1000–1500) occupation of the Ozarks in Northwest Arkansas is known through few

multiple-mound ceremonial centers in river valleys and from rockshelters along limestone bluff lines. Few permanent habitation sites are recorded, and understanding how sites articulate in a larger settlement system is a major research question for the area. Using a combination of spatial datasets, including aerial imagery, lidar, and near-surface remote-sensing, characteristics such as site location, size, proximity, and layout are examined. Based on these variables, settlement appears largely unchanged from the preceding Woodland period indicating the strong influence of tradition in shaping Mississippian lifeways, despite the introduction of mound ceremonialism and major changes in subsistence.

Koyiyumptewa, Stewart [90] see Ermigiotti, Paul

Kraan, Claudia [234] see Giovas, Christina

Kraan, Claudia [121] see Kappers, Michiel

Kramer, Karen [50] see Greaves, Russell

**Krasinski, Kathryn (Adelphi University), Angela Wade (Chickaloon Village Traditional Council), Norma Johnson (Chickaloon Village Traditional Council) and Fran Seager-Boss (Chickaloon Village Traditional Council)**  
**[96]**

*Landscape Learning and Climate Change: A Perspective from South-Central Alaska*

The circumpolar north is one of the most rapidly warming places on the planet, resulting in changing vegetation, precipitation, and fire regimes along with altered animal migration cycles. Combined these trends are transforming once familiar places into environments to which people are unaccustomed, perhaps even new environments. Here we present a case study of collaborative community-participatory archaeology where ongoing fieldwork in a changing landscape is providing new perspectives on landscape learning in south-central Alaska. Detailed knowledge of geographic principles along with webs of relationships and interconnections throughout the landscape facilitate effective landscape reading especially when people engage in fine-tuned observations of changes. We see this reflected in the archaeological record as well as current practice.

Krasinski, Kathryn [15] see Wygal, Brian

**Kraus, Michael (Bureau of Land Management)**  
**[182]**

*3D Printing and Scanning Artifacts: A Means of Public Engagement*

3D printing and scanning technologies may have progressed to a level where the interested public can start to affordably engage with agency archaeologists and artifacts in a new way. Simple 3D scanning applications for smartphones now allow for rendering print files of small objects such as projectile points in a completely unobtrusive way. Artifacts that members of the public find can be recorded and re-created using easy-to-operate 3D resin printers without leaving the location they were found. This means a physical connection for the public to the artifacts that they find without the removal of important data. This technology can also be useful in creating inexpensive teaching aids that everyone can safely interact with. In the near future, it will be possible for someone to contact their local archaeologist send them photos and a scan along with an artifact's pertinent information, and in return receive a replica that they can share and cherish while learning about the artifact and its importance. 3D technologies can give archaeologists the means of physically connecting the public to the artifacts they find without removing artifacts from the landscape.

**Krause, Samantha (Texas State University)**

[17]

Chair

**Krause, Samantha (Texas State University), Tripti Bhattacharya (Syracuse University), Sheryl Luzzadder-Beach (University of Texas) and Timothy Beach (University of Texas)**

[54]

*The Anthropogenic Wetlands of Northwestern Belize: Decades of Research and New Horizons for Study*

It is now clear that wetlands were critical resources for populations throughout human history in the Maya Lowlands of Belize and adjacent regions, and that these wetlands serve as important ecosystems and cultural heritage zones today. In northwestern Belize, decades of research have transformed our understanding of wetland paleoecology, system response to climate perturbations, and human resource use. Our recent excavations and lidar survey demonstrate that Maya farmers managed riparian wetlands in northwestern Belize to a much greater spatial extent than previous estimates, in some places beginning widespread cultivation starting as early as 2100 cal BP, with evidence of farming and management ending as late as 690–620 cal BP. This paper reviews past coring efforts across varied wetlands of northwestern Belize and then synthesizes previous datasets and records with new information and proxies, with the goal of providing new insights into regional wetland use and change over the Holocene. Through this work, we seek to improve the chronology for ancient wetland use and enhance our understanding of wetland resources used by the ancient Maya over various cultural periods and environmental shifts in this region.

Krause, Samantha [17] see Brouwer Burg, Mariëka

Krause, Samantha [17] see Luzzadder-Beach, Sheryl

Krause, Samantha [54] see Smith, Byron

Kresse, Megan [165] see Shi, Stone

Kretzler, Ian [14] see Gonzalez, Sara

**Krier, Jon (University of Oregon), Christopher Ruiz (University of Oregon) and Marlene Jampolsky (University of Oregon)**

[155]

*Longevity: The Archaeology of a Chinese Gift Store and Restaurant in Eugene, Oregon's Market District*

Over the span of more than a year from 2019 to 2020, University of Oregon Museum of Natural and Cultural History archaeologists monitored construction work for an affordable housing project in downtown Eugene, Oregon. During the monitoring, Chinese artifacts were found, which opened a window onto the poorly documented history of diasporic Chinese immigrants in Eugene. Archival research, artifact analysis, and a combination of newspaper articles and advertisements revealed the story of a Chinese-American family (Wing Kee and Marie Westfall) living in Oregon and owning and operating a restaurant and gift shop in the early twentieth century against a backdrop of both national Chinese exclusion laws and Oregon-specific prohibitions against Chinese ownership of property.

**Kroot, Matthew (Arizona State University)**

[183]

*Home Economics at Pre-pottery Neolithic B Al-Khayran? Reconstructing Residential Unit Economic Behavior through Knapped Stone Analysis at a Small Site in West-Central Jordan*

The shift from primarily foraging to predominantly farming economies that occurs during the early Neolithic of southwest Asia is commonly seen as a transition not merely in subsistence practices but economic relations as well. Many researchers argue that new forms of households emerge by the end of this time

period, which serve as both residential and economic units. In this presentation, I look at residential and economic behavior at Middle Pre-pottery Neolithic B (MPPNB) al-Khayran in the west-central Jordanian Highlands to see if and how these dynamics are manifested at the site. I analyze the knapped stone assemblage from al-Khayran in order to understand the range of economic behaviors enacted at the site and how they contrast with the behaviors attested to in residential contexts at other sites of the southern Levantine MPPNB. Results show that al-Khayran was likely occupied by a single residential unit comparable to typical village-based households of the time period, which enacted both household maintenance activities and intensive cereal production. These results reinforce the argument that newly emergent households functioned as economic units during the early Neolithic, while also expanding our understanding of MPPNB residential practices and their relationships to subsistence systems.

**Krug, Andrew (University of Oklahoma), Matthew Pailles (University of Oklahoma), John Carpenter (INAH-Sonora) and Guadalupe Sánchez (INAH-Sonora)**

[48]

*Sclerochemistry in Northwest Mexico: Evaluating Marine Shell Conveyance through Stable Isotope Analysis*

This paper presents an updated interpretation of marine shell exchange in the NW/SW. Isotopic analyses of marine shell can yield novel insights into regional trade networks. Our paper reviews C and O assays from archaeological assemblages in the NW/SW. These results demonstrate that the northern stretches of the Sea of Cortez are significant procurement locations for late precolonial communities, which counters previous macro-regional models of conveyance. Recent and ongoing research now focuses on assessing the viability of exchange corridors through the Sierra Madre Occidental. These efforts highlight the need to incorporate regional political and ritual economies, the need for greater sampling of archaeological assemblages, and the expansion of baseline isotopic profiles in the Sea of Cortez.

**Krupa, Krystiana (University of Illinois, Urbana-Champaign)**

[105]

*Chair*

**Krupa, Krystiana (University of Illinois, Urbana-Champaign), Rhianna Bennett (LG2 Environmental Solutions), Anna Coon (Association for Washington Archaeology) and William Farley (Southern Connecticut State University)**

[105]

*Establishing a Space for Archaeologists in Gaming: The Development of the ArchaeoGaming Collective*

The subdiscipline of archaeogaming has gained traction over the last several years, applying archaeological methods to and in video and tabletop games. Archaeology as a field focuses on concepts of space and place (and their roles in the past) quite literally, and it lends itself well to game applications including built environments and environmental storytelling. Part of the proposed presentation will discuss applying archaeological knowledge and practices to game worlds and how these are used to immerse players in games. The expansion of archaeogaming as a subdiscipline has created the need for a different kind of “space”: one where researchers addressing these topics can participate in a community and exchange ideas. Virtual communities utilizing online spaces such as Discord became particularly attractive during the early phases of the COVID-19 pandemic. In summer 2020, the ArchaeoGaming Collective (AGC) established a Discord server to meet the needs of the growing archaeogaming community. The AGC has since developed an annual virtual conference and has led to a variety of collaborative research projects and conference symposia involving its members. This presentation will describe the development and evolution of the AGC and its goals for both the archaeogaming community and the public.

Krupa, Krystiana [124] see Bader, Alyssa

Krupa, Krystiana [124] see Hargrave, Eve

Krupa, Krystiana [136] see Hawkins, Rebecca

**Krus, Anthony (University of South Dakota)****[64]***Chair***Krus, Anthony (University of South Dakota), Edmond Boudreaux III (Mississippi State University), Charles Cobb (Florida Museum of Natural History) and Brad Lieb (Chickasaw Nation's Heritage Preservation Division)****[64]***Big Data for Late Mississippian Depopulation: A View of Vacant Quarter Chronologies from the Canadian Archaeological Radiocarbon Database*

Over the past decade, the Canadian Archaeological Radiocarbon Database (CARD) has expanded to include entries on over 100,000 radiocarbon dates from the lower 48 states, serving as a freely accessible database that can help reassess big picture questions involving archaeological chronology. In this paper, we use data from CARD to contextualize the timing and tempo of the Vacant Quarter depopulation in the Eastern Woodlands, which impacted Mississippian (AD 1000–1700) polities centered in the confluence of the Mississippi, Ohio, and Tennessee Rivers in the AD 1400s–1500s. We have also obtained 133 new radiocarbon measurements from archaeological samples that robustly date Late Mississippian polities in two of the Vacant Quarter subregions: the Upper Tombigbee River and the Middle Cumberland Region. We use chronological hygiene considerations to evaluate the quality of the legacy radiocarbon data on CARD and Bayesian chronological modeling of this data to assess the timing of Late Mississippian sites within the Vacant Quarter. Through considering data compiled on CARD and newly obtained radiocarbon data for addressing a big picture question, we provide a larger commentary on the utility of legacy data compilations in chronologically driven archaeological research.

Krzepkowski, Marcin [251] see Gembicki, Maciej

Krzepkowski, Marcin [251] see Ragsdale, Corey

Krzepkowski, Marcin [251] see Wysocka, Joanna

**Kuckelman, Kristin (Crow Canyon Archaeological Center)****[90]***Thirteenth-Century Villages and the Depopulation of the Northern San Juan Region by Pueblo Peoples*

The initial 40 years of research conducted by the Crow Canyon Archaeological Center included several excavation projects that focused on a primary stated research goal of the center: discover why Pueblo peoples completely and permanently vacated the northern San Juan region late in the thirteenth century. Excavations conducted at sites of numerous pueblos constructed and occupied during the final decades before depopulation yielded a plethora of data indicating that drought, subsistence stress, and inter-pueblo warfare were among stimuli associated with this historic and pivotal depopulation. In this paper, I review, synthesize, and contextualize results of this crucial research.

Kuehn, Stephen [15] see White, John

**Kuijt, Ian (University of Notre Dame)****[108]***Discussant***[184]***Chair***Kuijt, Ian (University of Notre Dame) and Arkadiusz Marciniak (Adam Mickiewicz University, Poznan, Poland)****[184]***How Many People Lived in the World's Earliest Villages? Reconsidering Community Size and Population Pressure at Neolithic Çatalhöyük*

Some researchers hold that Near East Neolithic agricultural villages were composed of thousands of people and that these villages existed as an evolutionary starting point on the path to rapid population growth and urbanism. Reevaluating the settlement of Çatalhöyük, Turkey, in this paper we outline how historical estimates of Neolithic population levels are disengaged from current archaeological and ethnographic data. To gain a more nuanced and robust understanding of Neolithic site demography we develop multiple population scenarios and outline how spatial packing of buildings and building use-life are critical in estimating past population levels. In contrast to historical views of Çatalhöyük being occupied by 3,500–10,000 people, we estimate between 600 and 800 people would have lived at Çatalhöyük East during an average year during the Early (7100–6700 cal BC) and Middle (6700–6500 cal BC) phases, and between 200 and 400 people would have lived at Çatalhöyük East during an average year during the Late (6500–6300 cal BC) and Final (6300–5950 cal BC) phases. Collectively there is a clear need to reconsider arguments for population pressure as a driver of the Forager-Farmer transition, the development of food production, and the emergence of social inequality in the context of early agricultural villages.

Kuijt, Ian [162] see Vazquez Fiorani, Agustina

**Kupprat, Felix (Universidad Nacional Autónoma de México)**  
[158]

*Discussant*

Kupprat, Felix [189] see Lockett-Harris, Joshua  
Kupprat, Felix [147] see Longstaffe, Matthew  
Kupprat, Felix [204] see Reese-Taylor, Kathryn  
Kupprat, Felix [93] see Vázquez López, Verónica

Kurin, Danielle [10] see Black, Valda

**Kurnick, Sarah (University of Colorado, Boulder)**  
[131]

*Chair*

**Kurnick, Sarah (University of Colorado, Boulder) and Samantha Fladd (University of Colorado, Boulder)**  
[131]

*Inequity Critiques: Fit, Prestige, and the Don Quixote Effect*

Over the last 35 years, scholars have produced an ever-increasing number of publications critiquing sexism and androcentrism in contemporary archaeological practice. Various studies have considered the relationship between intersectional gender identities and the completion of doctoral degrees, submission of external grants, and publication of peer-reviewed articles, among other activities. Such studies demonstrate that, despite women having received the majority of PhDs in anthropological archaeology in the United States for over 20 years, there still exist significant gender disparities in prestigious scholarly practices. This introductory paper to the organized session “Beyond Leaky Pipelines: Exploring Gender Inequalities in Archaeological Practice” summarizes the history and current state of archaeological equity critiques—perhaps better termed inequity critiques—and identifies potential new avenues of intersectional research. Specifically, this paper highlights the need to examine more critically concepts such as fit and prestige that may unintentionally perpetuate exclusion, and suggests that contemporary archaeological gender disparities may usefully be understood as what Pierre Bourdieu has termed the hysteresis of habitus or the Don Quixote effect—the consequence of individual habitus not changing at the same rate as social structures.

Kurnick, Sarah [131] see Bishop, Katelyn  
Kurnick, Sarah [131] see Fladd, Samantha

Kurnick, Sarah [131] see Hoppes, Kelsey

Kurnick, Sarah [242] see Puente, Nicholas

**Kusimba, Chapurukha**

[22]

*Forty Years of Community Archaeology, Archaeology of Listening, and Working Together in the L. Titicaca Basin*

One of the most critical issues facing archaeology today remains how to best figure out research on problems that are significant to living peoples, particularly those descended from prehistoric and historical populations that we study. We have learned how paradigms antithetical to local historical sensibilities can harm the community and alienate professional archaeologists. Yet despite these pumps, archaeology has made remarkable progress in its quest to understand the past in all its dimensions. Each generation of archaeologists has tinkered with ways to refine theories, methods, and practices to address enduring questions, changing interpretations, and their relevance. My paper will revisit the idea of community archaeology, the archaeology of listening and working together through the review of the career of Professor Charles Stanish in the Andes. What lessons might others glean from Professor Charles Stanish's praxis?

Kuwanwisiwma, Leigh [90] see Bernardini, Wesley

Kuwanwisiwma, Leigh [90] see Ermigiotti, Paul

Kuzminsky, Susan [69] see Rangel, Esteban

**Kvetina, Petr (Institute of Archaeology Prague, Czech Republic), Sylva Drtikolova-Kaupova (National Museum, Czech Republic), Ivana Jarosova (Anthropos Institute, Moravian Museum, Czech Republic), Zdenek Tvrdy (Anthropos Institute, Moravian museum, Czech Republic) and Frantisek Trampota (Institute of Archaeology Prague, Czech Republic)**

[3]

*Neolithic Dietary Practices: Comparison of Stable Isotopes and Dental Microwear*

The aim of the paper is to reconstruct Middle and Late Neolithic dietary practices in Central Europe with the help of complementary evidence of stable isotope and dental microwear analysis. From a total of 171 individuals, carbon and nitrogen isotopic values were measured in bone collagen from 146 humans and 64 animals, and 113 individuals were included in buccal dental microwear analysis. The samples were divided into two newly established chronological phases: Neolithic B (4900–4000 BC) and Neolithic C (3800–3400 BC). A small but statistically significant shift in human carbon isotopic values to higher  $\delta^{13}\text{C}$  was observed during the Neolithic C, probably reflecting the underlying change in plant growth conditions. Dental microwear results showed a tendency toward higher meat consumption in adults during Neolithic C but were not reflected in the  $\delta^{15}\text{N}$  values. The positive correlation between nitrogen isotopic values and dental microwear characteristics of a meaty diet observed in the adult sample suggests that meat rather than milk was a dominant source of animal protein. We believe that the documented shift represents the change between the early Neolithic way of life and the new economy and social structures of the later period.

**Kwak, Seungki (Kyungpook National University), Sujung Lee (Kyungpook National University) and Heegeun Kim (Kyungpook National University)**

[220]

*Beyond "Maritime": New Approaches in Understanding Foodways of the Neolithic Coastal Dwellers in the Korean Peninsula during the Early-Middle Holocene*

This study investigates the subsistence and foodways of Neolithic coastal foragers in the Korean Peninsula using an innovative method of organic chemistry. The Neolithic subsistence practice in the Korean peninsula is characterized as "maritime hunting-gathering-fishing." Throughout the Neolithic period, people occupied

islands and coastal regions, creating hundreds of shell middens. In coastal and island settings, subsistence studies rely heavily on shell middens because faunal remains are well preserved. This study aimed to provide new evidence related to prehistoric foodways by directly analyzing potsherds and sediments using organic residue analysis. The potsherds and sediments were collected from well-known Neolithic coastal and island sites located in the southern part of the Korean Peninsula. Preliminary results suggest that Neolithic subsistence was more dynamic and varied than is posited by models focused on marine resources.

**Kwoka, Joshua (University at Buffalo)**

[236]

*Lithic Debitage, Thermal Damage, and Other Signs of Conflict*

While fortifications speak to the potential for conflict, indicators of actual warfare are difficult to discern. The ancient Maya produced few lithic implements that were strictly martial in nature. Furthermore, evidence of destruction events, such as large-scale fires, preserve poorly in tropical environments. However, recent research conducted at La Cuernavilla indicates that lithic artifacts can provide valuable information concerning large-scale fires. This paper discusses the significance of thermal damage present on lithic debitage, as well as other signs of conflict.

Kyaw, Pyiet Phyo [109] see Macrae, Scott

**Kyorlenski, Georgi (UCLA)**

[189]

*Building Alliances, Return to Origins, and Monumental Failure: Huascar's Royal Estate at Kañaraqay and the Inca Civil War (1528–1532)*

Although the Inca civil war (1528–1532) set the stage for the transatlantic encounter in the Andes, it has been relegated to a historical footnote. This is largely due to the fact that the relatively short Inca imperial period (or Late Horizon, 1440s–1532) has been mostly studied as a monolithic whole. Yet Inca material culture varies dramatically through both time and space. Since building was both one of the most potent expressions of Inca power in the Andes and one of the main expectations for its rulers, Huascar's royal estate at Kañaraqay, built during the war, offers a glimpse at the geopolitics of the terminal days of the Inca empire. The choice of location, site planning, and its urban character point to a narrative of return to origins through which Huascar attempted to attract support in the conflict with Atahualpa. His ultimate failure sheds light on how monumental construction projects might have been a tool for power acquisition rather than a mere reflection of the power of their patrons.

**LaBelle, Jason (Colorado State University)**

[170]

*Chair*

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

[170]

*Low and Slow: Landscape Taphonomy of High-Altitude Landscapes within the Southern Rocky Mountains of Colorado*  
Over the past 10 years, survey crews from CSU's Center for Mountain and Plains Archaeology examined the alpine ecosystem of the Colorado Front Range, recording a variety of sites such as game drives, lithic and ceramic scatters, and ice patches within Rocky Mountain National Park and adjacent wilderness areas. We take a "low and slow" survey approach—often finding more artifacts with such methods but also examining how these sites came to be used and reused, buried, and exposed over past millennia. Taking this site-less approach, we better view these as cumulative landscapes registering the ebb and flow of human occupation, with some locales showing near continuous use for millennia and others, short-term and perhaps one-time use. One of LC Todd's greatest lessons is in freeing oneself of long held assumptions—to claim yourself as

ignorant and then taking the necessary steps to build germane knowledge to better inform the question at hand. In this presentation, we highlight some of the ignorance we have sought to overcome in this work, and lesson's inspired by Todd to better improve our knowledge production and interpretation.

LaBelle, Jason [170] see Hill, Matthew G.

**LaDu, Daniel (University of Southern Mississippi)**

[151]

*Revisiting Interaction Sphere Theory*

As both a universal cultural influence and important catalyst for change, diffusion matters. I advocate for the restoration of the Interaction Sphere as a rigorous theoretical means of rehabilitating the concept of diffusion. We begin with the history of this construct in order to place its architects and tenets in their proper developmental context. The formal attributes of this behavioral theory are illustrated using three indigenous North American “circle-maps,” and exemplified through their application to the complex issue of Plaquemine cultural emergence in the Lower Mississippi Valley. I conclude by highlighting the advantages, limitations, and potential of Interaction Sphere Theory.

**LaGrasta, Kaitlin (Johnson, Mirmiran & Thompson [JMT])**

[6]

*Horizons of Color, Shape, and Size: A Stratigraphic Analysis of Glass Beads in Fur Trade-Era Onöndowa'ga:' (Seneca) Towns*

George Hamell's 1992 paper “The Iroquois and the World's Rim: Speculations on Color, Culture, and Contact” considers color symbolism in the Seneca (Onöndowa'ga:') context to contemplate the metaphysics of the colors red, black, and white in Seneca cosmology and material culture. While widely cited within archaeological scholarship, Hamell's work has its limitations; however, considering broad color categories in archaeological analyses of glass beads can be more suitable than the fine-grained specificity of the Kidd and Kidd (1979) typology. As such, archaeological scholarship of glass beads has begun to implement these broad color categories to examine entire assemblages and to compare multiple assemblages. This paper applies this emerging research and methodology to a smaller scale: within individual features. This paper examines glass bead color, as well as shape and size, in fire-related pit features in the Seneca towns of Ganondagan (ca. 1670–1687) and White Springs (ca. 1680–1715). This holistic approach has several outcomes: to establish a depositional chronology of features within each site, to understand the activities and daily lives of people who resided these towns, and to identify dynamic, generational trends in Seneca glass bead use.

Laló Jacinto, Gabriel [172] see Paris, Elizabeth

Lamb, Madison [201] see Forest, Marion

**Lamb, Trevor (Boston University)**

[43]

*Food, Fuel, or Fluke? The Interpretive Potential of Microbotanical Remains Recovered from Burnt Residues on Koniag Pottery from the Malriik Site (KOD-405), Kodiak Island, Alaska*

On Kodiak Island, Alaska many aspects of life changed during the Koniag Phase (650–200 BP): houses became larger and side-rooms were built to store food, social status and labret wearing intensified, community buildings known as qasgit (“men's houses”) were built, and people began to use pottery. Zooarchaeological evidence demonstrates that marine mammals, marine fish, and salmon were important foods, and lipid evidence suggests that pottery was used to cook or render oil from whale blubber and salmon. Ethnohistoric records demonstrate that starchy roots, bitter leaves, tender shoots, and berries are important plant foods

for contemporary Alutiiq people and their ancestors, yet there is limited archaeological evidence revealing how plant foods were incorporated into meals during the Koniag Phase. Here, I present my preliminary analysis of phytoliths and wood charcoal fragments recovered from burned food adhered to the interior of Koniag Pottery. My results suggest that the identification of leafy greens may be challenging, but starchy tubers and woody shoots may be identifiable. I suggest that understanding how animal and plant foods were combined to make meals can improve understandings of gender and status based eating and feasting practices that arose during the Koniag Phase.

**Lambert, Spencer (Southern Methodist University)**

[122]

*A Preliminary Study on Food and the Emergence of Archaic States in the Hawaiian Islands*

Archaeologists approach the topic of ancient foodways in two major ways: by focusing on “diet” and adaptation to local environments, or more recently, by focusing on “cuisine,” through culturally specific rules about how food is acquired, prepared, consumed, and discarded. Few, however, have attempted to consider how changes in diet and cuisine have articulated with periods of major social change, such as the transition for chiefdom to state societies. The Hawaiian Islands are an excellent case study for examining diet, cuisine, and inequalities in access to food during the transition to an archaic state. Ethnohistoric and archaeological evidence indicates that archaic states formed in the Hawaiian Islands around AD 1600. With these sociopolitical changes came a complex hierarchical system, monumental architecture, intensive agricultural production, and strict religious food restrictions. This study presents preliminary zooarchaeological data from Kohala and Kona, Hawai'i Island. This research examines how meat diet and cuisine changed over time, as well as evidence for unequal distribution of food between commoners and elites.

**Lamoureux-St-Hilaire, Maxime (Mount Royal University)**

[93]

*Chair*

[158]

*Moderator*

**Lamoureux-St-Hilaire, Maxime (Mount Royal University) and Tomas Barrientos (Universidad del Valle)**

[93]

*A Functional Approach to Classic Maya Regal Palaces: Case Studies from La Corona and Cancuen*

Regal palaces, found in the epicenter of great many polities, were a defining element for most Classic Maya political regimes. While they varied in size and shape, all regal palaces seem to have anchored two essential dimensions of Classic Maya politics: the household of royal families and the administrative-ceremonial cores of regimes. In this paper, we take a functional approach to palatial architecture and propose a terminology for the different, yet complementary activities that occurred within regal palaces and facilitated the operation of political regimes. We focus on the regal palaces of La Corona and Cancuen, Guatemala, where residential, communicational, economic, administrative, and ceremonial activities operated in a pragmatic and complementary fashion. These five types of activities are identified through architectural, artifactual, and geoarchaeological evidence. The results of our comparative study suggest that, even if the same set of activities occurred in these architectural institutions, their spatial organization differed significantly. These differences help us identify how the architectural institutions that anchored these polities in place reflect their distinct, yet comparable regimes.

Lamoureux-St-Hilaire, Maxime [93] see Canuto, Marcello

Lamoureux-St-Hilaire, Maxime [106] see Morales Forte, Rubén

**Lancaster, JD (Desert Research Institute), Teresa Wriston (Desert Research Institute), Molly Casperson (US Army Corps of Engineers), Loren Davis (Oregon State University) and Jillian Maloney (San Diego State University)**

**[62]**

*Geoarchaeological Investigations in the Upper Willamette Valley and Western Cascade Mountains, Oregon*

The rivers of the Upper Willamette Valley and Western Cascades have drawn people to their resource rich banks since the Late Pleistocene with evidence of human habitation variably preserved as the watersheds evolved. Since the US Army Corps of Engineers (USACE) constructed the Willamette Valley Project, a system of 13 dams and reservoirs in six subbasins, preservation of landforms that may contain archaeological evidence have been influenced by 50–80 years of cyclical seasonal inundation, water level fluctuation, and erosion. To help USACE manage resources within the system but also provide a regional stratigraphic and environmental framework for future research we are using an interdisciplinary approach to locate submerged and potentially buried archaeological sites. Our phased approach includes a newly developed regional archaeological context and research design, archaeological landscape sensitivity modeling, and summer boat-based geophysical investigations that inform winter sediment sampling in drawn down reservoirs. Analysis of recovered cores and auger samples will provide information on the age and character of the landforms, periods of landscape stability, and paleoenvironments, which will then be used to calibrate the archaeological landscape sensitivity model. This presentation reviews ongoing work and preliminary data retrieved from six of the Willamette Valley Project reservoirs.

**Landa, Yesenia (University of Texas, Austin), Sheryl Luzzadder-Beach (University of Texas, Austin), Thomas Garrison (University of Texas, Austin), Timothy Beach (University of Texas, Austin) and Byron Smith (University of Texas, Austin)**

**[236]**

*Feeding a Citadel: Subsistence Practices*

La Cuernavilla is an ancient Maya site situated in the El Zotz Biotope in the central Petén of Guatemala. This study focuses on the paleoenvironmental changes, agricultural subsistence, and occupational trajectories of La Cuernavilla, based on data gathered from across the larger landscape between 2009 and 2017 on the Proyecto Arqueológico El Zotz (PAEZ). Soil cores, water samples, and soil samples were collected from the cival, reservoir, dam, bajo, flattened terrain adjacent to the bajo, and the surrounding features near La Cuernavilla, providing insights into past environments and subsistence strategies. Results from pollen, phytolith, eDNA, and water chemistry analyses show changes in the paleoenvironment and climate throughout time. At a regional scale, recent hydrological data reveals an emphasis on manipulation and control of water for both agriculture and consumption. Within the flattened terrain adjacent to the bajo, the dearth of material culture suggests this area was used for agriculture rather than settlement. This case study highlights how the ancient Maya adapted subsistence practices during times of environmental or resource stress.

Landau, Kristin [210] see Larson, Katherine

**Landin, Nils**

**[75]**

*A Review of the Antiquity and Distribution of Intertidal Fishing Technology in Southeast Alaska and Future Research Inquiry*

Important questions related to the innovation of intertidal fishing on the Pacific Northwest Coast of North America remain, including when and where different versions of this technology were first used. This poster provides a brief overview of this phenomenon in Southeast Alaska using GIS. Additionally, we offer suggestions for future research using remote sensing and geoarchaeological methods, as well as Tlingit oral history, to investigate the antiquity of this technology and its relationship to the migration of clans, as well as changes in salmon abundance over time.

Landis, Catherine [16] see Witt, David

Landon, David [135] see Reinhart, Katharine

**Landvatter, Thomas (Reed College) and Brandon Olson (Metropolitan State University of Denver)**

**[69]**

*Investigating Imperialism on Early Hellenistic Cyprus: Excavations at Pyla-Vigla, 2019 and 2022*

Since 2008, the Pyla-Koutsopetria Archaeological Project (PKAP) has been excavating the site of Pyla-Vigla, located on a small plateau near Larnaca, Cyprus. Early small-scale excavations (2008, 2009, 2012, 2018) revealed what appears to be an early Hellenistic (330–250 BCE) fortification. In the early Hellenistic period, Cyprus was undergoing a massive political and cultural transformation, as the island moved from being ruled by a heterogeneous collection of city-kingdoms to eventual incorporation as a province of the Ptolemaic Egyptian state. With little evidence of substantive later occupation, Vigla is an ideal case study for examining fortifications as mechanisms of imperial consolidation and coercion in a pre-modern context, both in terms of the physical markers of an imperial presence (i.e., the fort itself) and in terms of the people who were the instruments of consolidation (i.e., the soldiers resident at the fortification). Beginning in 2019, a larger-scale program of excavation was begun at Vigla, focusing on clarifying the occupation history of the site; defining the nature and extent of the fortification system; examination of the early-Hellenistic ceramic corpus; and examination of domestic activity areas. This poster presents the results of excavations in 2019/2022, focusing on the fortification system and domestic areas.

**Lanoë, François (University of Arizona), Joshua Reuther (University of Alaska) and Gerad Smith (University of Alaska)**

**[15]**

*The Porcupine Tail Site Complex and the Concentration of the Archaeological Record on Isolated Hills of Interior Alaska*

The archaeological record in any landscape tends to be differentially concentrated on specific landforms, because such landforms favor both the recurrence of human activities over successive periods of time and the postdepositional preservation of their material traces. In this paper we present results from recent excavations at two neighboring sites (Hollembaek's Hill and North Gerstle Point, which we collectively term the Porcupine Tail [*nuun che*] site complex after the Dene name for the landform) and discuss how they are representative of elevated and isolated landforms of interior Alaska. Both sites have yielded, in limited excavation windows, numerous archaeological components whose number nears that of stable surfaces (paleosols), and which generally contain the entire regional archaeological sequence. We argue that this concentration of the archaeological record relates to the geomorphic and geographic characteristics of the landforms and is representative, if perhaps more marked, of many of the interior Alaska sites. We further discuss the ways in which our vision of the archaeological record may reflect, or alternatively distort, the actual settlement and mobility patterns of past interior Alaska people.

Lanoë, François [15] see Crass, Barbara

**Lansche, James**

**[176]**

*Towers in the Northern Periphery*

New research in the northern portion of Bears Ears National Monument reveals unique forms of late twelfth-century Ancestral Pueblo towers that vary from nearby Cedar Mesa and Hovenweep. This poster presents a study of towers in Beef Basin, a large valley north of the Abajo Mountain Range draining into the Colorado River, and examines the unique architecture, placement on the landscape, internal features, as well

as their positioning in the ritual landscape that distinguishes them from Ancestral Pueblo towers farther south and east. This project implements the use of lidar, viewshed analysis in GIS, and pedestrian survey of previously unrecorded acreage in Bears Ears National Monument. The lidar, in particular, has revealed cultural landscape features including prehistoric roadways and field systems suggesting a robust occupation of the basin. These methods combined with an in-depth comparison to previous tower studies conducted in southeastern Utah provide more context for these unique towers as integral and defining features within the Beef Basin cultural landscape.

Lapham, Heather [128] see Briggs, Rachel

LaPlante, Emily [121] see Hackenberger, Steven

LaPlante, Samantha [181] see Moriarty, Ellen

**Lapp, Jennifer**

[156]

*Moderator*

[156]

*Discussant*

Lara, Barbarita [57] see Balanzategui, Daniela

Lara, Catherine [59] see Bray, Tamara

**Larkin, Karin (University of Colorado, Colorado Springs)**

[156]

*Discussant*

**Larkin, Karin (University of Colorado, Colorado Springs), Fawn-Amber Montoya (James Madison University) and Robert Butero (United Mine Workers of America)**

[14]

*Long-Term Collaboration and Advocacy around the Ludlow Massacre*

The 1913–1914 southern Colorado coalfield strike and Ludlow Massacre had lasting impacts on labor law reforms that occurred in Colorado and the United States over the subsequent decades. The Colorado Coalfield War Archaeological Project (CCWAP) worked with the United Mine Workers of America union to focus an archaeological lens on the social and material conditions leading up to the strike and massacre and their aftermath. A decade after the project concluded, the Ludlow Centennial Commemoration Commission formed to commemorate the 100-year anniversary of the strike and massacre. Work by the Colorado Coalfield War Archaeology Project and Ludlow Centennial Commemoration Commission offers a longitudinal example of the power of collaborative public scholarship. In this conversation, we discuss issues around identifying appropriate descendant communities and other stakeholders with which to collaborate, the importance of building and maintaining relationships within and beyond academia, and the political nature and power of public archaeology, advocacy, and stewardship. While the collaborative experiences described here were unique, the lessons are widely applicable. The goal in sharing these ideas is to illustrate the importance of maintaining relationships with descendant communities after the end of project funding and exemplify the wide impact of well-designed collaborative public archaeology.

**Larmon, Jeannie (Historical Research Associates)****[57]***Environmental Justice and the Water Temple at Cara Blanca, Belize*

Nestled between stark white limestone cliffs and freshly burned agricultural fields, the Cara Blanca, Belize, water temple complex sits teetering on the edge of a 60+ m deep cenote. The Ancestral Maya built the structures so as to integrate the structure and the landscape—with materials from the Cara Blanca waters and items (such as water jars) that connected construction and use of space. This “ecological transformation,” which was a pivotal community space for Ancestral Maya during the Terminal Classic period, has subsided into the landscape, becoming heavily overgrown and partially falling into the water. Today, the infrastructure of the space, the water temple complex, is playing a pivotal role in the protection of the landscape, including the health of the Cara Blanca waters. This paper will explore the duration of infrastructural intention and impact of archaeological infrastructure on movements of environmental justice.

**Larmon, Jeannie (Historical Research Associates)****[194]***Moderator*

La Rosa, Juan Carlos [28] see Bak, Judyta

**Larreina-Garcia, David (UPV-EHU: University of the Basque Country) and Blanca Maldonado (Colmych)****[13]***Extracting Copper from Sulphidic Ores: The Jicalán Viejo Smelting Site*

Contrary to other Mesoamerican cultural and political entities, the Purépecha Empire is renowned for its remarkable development of metallurgical production. Ongoing research at the site of Jicalán Viejo involves the analysis of technical materials, including ore and fragments of furnace walls. This research has identified a multi-step process—each step rendering different types of slag—to reduce copper from sulphidic ores and to gradually reduce the metal from complex ores. While the reverse engineering to reconstruct the *chaîne opératoire* of the technological process is still at an early stage, one of those steps is visible in Jicalán rendered slag cakes, which bear numerous unreacted inclusions. This slag type is most commonly associated with copper or lead/silver smelting processes and has been found widely around the Mediterranean, the Alps, and north China. These different productions span a very long chronological range and an apparent long distance from one another, indicating that this is not a cultural practice but a technological one. Therefore, this paper intends to thoroughly document and characterize this slag type in Jicalán and compare it with similar by-products found elsewhere to approach this conspicuous type of slag.

Larreina-Garcia, David [125] see Maldonado, Blanca

Larreina-Garcia, David [13] see May-Crespo, Jose

Larreina-Garcia, David [13] see Pedroza, Berenice

Larreina-Garcia, David [13] see Sanchez Guerrero, Andres Francisco

Larreina-Garcia, David [13] see Velázquez-Maldonado, Luis

**Larrick, Dakota (University of Arizona), Christopher Baisan (Laboratory of Tree-Ring Research [LTRR]), Charlotte Pearson (Laboratory of Tree-Ring Research [LTRR]) and Hugo García Ferrusca (Instituto Nacional de Antropología e Historia)****[74]***Radiocarbon Wiggle-Matching on a Dendrochronologically Dated Timber Sample from Paquimé*

Paquimé, or Casas Grandes, is one of the largest and most complex archaeological sites in the North American Southwest. Paquimé was of central and wide-reaching importance in the cultural region referred to as the Gran Chichimeca during the Medio period (AD 1200–1450), and therefore remains of crucial

significance to borderland archaeology (Minnis 2003). Tree-ring dates for Paquimé published in 1966 by S. D. Scott suggest that major construction at the site occurred in the fourteenth century, with the latest date being CE 1338 (Scott 1966). Of the 80 samples dendrochronologically dated by Scott, only this one extends into the fourteenth century. All other samples dated to the mid-thirteenth century or earlier, making the CE 1338 date a significant outlier. Subsequent researchers have reanalyzed many of these timbers and questioned the veracity of this date (D. Stahle, personal communication). We propose to do a radiocarbon wiggle-match of the samples to either definitively confirm or refute Scott's published date. This poster will present the results of our radiocarbon wiggle-matching, which will contribute significantly to the understanding of Paquimé.

Larrick, Dakota [48] see Kessler, Nicholas

**Larson, Kara (University of Michigan)**

[76]

*Chair*

**Larson, Kara (University of Michigan)**

[76]

*A Zooarchaeological Application of Adaptive Cycling and Risk Mitigation at Tell el-Hesi, Israel*

Human societies do not operate as a stagnated phenomenon but instead experience stacked cycles of adaptation, resilience, and possibly collapse. Identifying and teasing these cycles in the archaeological record can be difficult and have often been applied to hunter-gatherer case studies. This research attempts to apply an adaptive cycling model to Tell el-Hesi, an early urban locale in the Southern Levant, to identify periods of adaptation and resiliency. The site is characterized by rapid development, a series of prolonged occupations during the height of the Early Bronze Age II–III (3050–2300 BCE), and rapid collapse. Faunal remains from the Early Bronze Age occupation at the site are selected as the mode of analysis and are used as an indicator of potential adaptive cycles. Faunal remains are entwined with prehistoric economy and are an excellent reflection of adaptive cycling. The results of this case study suggest that changes in occupants' diet breadth occurred across different occupational layers with an increase in diet breadth prior to collapse at Tell el-Hesi, demonstrating the potential for the use of faunal remains to identify small scales of adaptive cycling operating at an early urban locale in the Southern Levant.

Larson, Kara [76] see Luurtsema, Anna

**Larson, Katherine, Kristin Landau (Loyola University Chicago) and Laure Dussubieux (Field Museum)**

[210]

*Ancient Beads from Southeast Asia at the Corning Museum of Glass*

In 2026, the Corning Museum of Glass—a world-renowned institution for glass studies in upstate New York—will update its major permanent exhibit of historical glass, “35 Centuries of Glass.” This reinstallation is committed to telling a more global, inclusive, and contextualized history of glass that features little-known and understudied objects in its collection, including in particular over 25,000 beads from Southeast Asia. A substantial portion of these beads originate from archaeological sites in Malaysia, and are thus key to understanding the role and life histories of trading ports around the Indian Ocean. Were these beads produced at major manufacturing sites in India, like Arikamedu, and shipped to Malaysia for further distribution? Were industrious entrepreneurs in Malaysia recycling broken glass pieces into beads for resale? We submitted a sample of 150 beads for LA-ICP-MS analysis at the Field Museum and report on our initial results here. Findings will be incorporated into Corning's new exhibit to tell a more complex, accurate, and holistic story of glass around the Indian Ocean in antiquity.

Larson, Mary Lou [229] see Lynch, Elizabeth

**Lasisi, Olanrewaju (William & Mary)**

**[60]**

*Indigenous Hermeneutics and the Contribution of Africa to Skyscape Archaeology*

Since the discoveries of the astronomical orientation of Stonehenge in the 1960s, several scholarships have employed skyscape archaeology to answer questions about state formation and consolidation of complex societies. The majority of these works have focused outside Africa, particularly on cultures in Latin America, China, Australia, and several Bronze Age cultures in Europe. Aside from North Africa, not much from the rest of Africa has contributed to skyscape archaeology scholarships. This is mainly because it requires an indigenous epistemological approach to explore questions of how ancient sub-Saharan African ancient civilizations used their observations of the sky to design their landscapes and organize their polities. This presentation explores some of the recent archaeological works in the Yoruba region of the Bight of Benin and proposes some indigenous hermeneutical approaches for doing skyscape archaeology that can be replicated in other parts of Africa. It presents archaeological, ethnographic, and linguistic evidence for the intentionality of astronomical practices by ancient Yoruba cultures, and shows that it requires an indigenous hermeneutic approach to interpret these shreds of evidence. This will allow Africanist archaeologists to use case studies from Africa to contribute to global debates for conducting skyscape archaeology.

Lata-Pinto, Gloria [125] see Hirth, Kenneth

**Latosky, Shauna (University of Northern British Columbia) and Pascale de Robert (Institute of Research for Development)**

**[226]**

*To Wear, or Not to Wear: Symbolism and Technology of Lip-Plates in Mursi (Ethiopia) and Mebêngôkre (Brazil)*

This chapter offers a comparative look at the labrets of the Mebêngôkre (Brazil) and Mursi (Ethiopia) with a special emphasis on how lip-plates are made, worn, valued, and evaluated at a normative level. By normative, we mean the historical, technical, symbolic, and discursive ways in which such practices are understood by the Mursi and Mebêngôkre in question, but also how normative views clash with those of outsiders, and/or have lost their symbolic significance for insiders who are either abandoning the traditional practice of wearing the labret, or whose reason for wearing it has changed. Ethiopian authorities, for example, tend to regard certain bodily practices, like the pottery lip-plate, as a “harmful,” “backward,” and coercive practice. While an increasing number of Mursi girls and women are abandoning the practice, some Mursi still view the wearing of labrets as a way to freely express womanhood. Young Mebêngôkre men no longer wear the lip-plate, which is said to make enunciation in Portuguese difficult, but piercing the lower lip is still practiced on infant boys to develop oratory.

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

**[219]**

*Red Metal, Domestic God: Prehistoric Copper Use in the Middle Atlantic Region*

Raw metals have been used by prehistoric peoples throughout the world. In the Middle Atlantic region of the United States, the most favored metal was copper. Copper objects of all kinds were seen as holding major religious and ceremonial significance. While there is evidence of Old Copper Culture artifacts in the region, it pales in comparison to evidence from the Early to the end of the Middle Woodland periods. This paper lays out my ongoing research on copper artifacts in the region and the uses and potential meanings of copper. Individual copper object types and measurement analysis are also described. I then show results of my sourcing studies and their implications on and interpretations for trade and exchange. Lastly, I present my thoughts on copper and its role in the participation of a mortuary ceremonialism program that may have originated from the north.

Lau, Annie [209] see Lowe, Kelsey

Lau, Hannah [101] see Budner, Hannah

Lau, Hannah [122] see Hoyt, Delia

Lau, Hannah [44] see Ives, Charlotte

Lauer, Tobias [87] see Negrino, Fabio

### **Laughton, Jennifer (University of Alberta)**

**[53]**

*Bite into This: Interproximal Wear Facets in Middle-Holocene Hunter-Gatherers*

In this dental anthropology project, the use of interproximal wear facets of teeth will be measured and studied to assess changes in facet size between Mesolithic, Neolithic, and Early Bronze Age hunter-fisher-gatherer populations. These populations hail from the Latvian Stone Age site of Zvejnieki, and from numerous Neolithic and Bronze Age sites across the Cis-Baikal region of Siberia, Russia. I will present the associations (or lack thereof) between facet size and diet, looking to see if there is a change in facet size with the introduction of pottery in the Neolithic, or whether different diets (i.e., fish vs. game) can be elucidated from them. For the Cis-Baikal, any associations found can be supported by extant dietary stable isotope data. Previous studies have suggested that interproximal wear facets show differences in diets among populations, and if this holds true, the samples above will provide evidence of 4,000 years of dietary prehistory.

### **Lau-Ozawa, Koji and Ryan Kennedy (Indiana University)**

**[217]**

*Diaspora on the Block: Neighborhood Archaeology as Theory and Method*

The archaeology of diaspora has grown in many directions during the first two decades of the twenty-first century. It has become a key way of understanding the short-term and long-term connections between people and communities defined by movement and migration. However, archaeologists of diaspora still at times struggle with old models of interpretation that seek out ethnic markers in material culture or signs of acculturation. How then do we move past these paradigmatic pitfalls? In this paper we look to the concept of the neighborhood as a potential avenue away from a cul-de-sac of theoretical stagnation. Neighborhoods, spatially proximal areas in towns and cities, often comprise multiple diasporic communities in close contact. Ethnic and racial lines are not necessarily neatly maintained challenging fixity or fluidity binaries when approaching diasporic communities. Thinking of the neighborhood as an interpretive model in itself challenges us to think past siloed communities and look to the distinct ways in which social identities and networks are dynamically shaped by living space in urban contexts. Utilizing material from Santa Barbara's Nihonmachi, we attempt to think through material culture through the lens of the neighborhood, appreciating the blurred lines across the multiple communities living on the block.

Lau-Ozawa, Koji [208] see Kennedy, Ryan

### **LavenderNees, Sarah (Kent State University) and Michelle Bebber (Kent State University)**

**[219]**

*Hopewellian Meteoric Iron Use: An Experimental Approach for Exploring Production and Function*

Hopewell artisans were innovative and highly skilled craftspeople, demonstrating proficiency with a wide variety of exotic materials, including meteoric iron. Here we explore the material properties of this unique raw material in terms of production and possible function. In this study, objects made from meteoric iron from Ohio Hopewell contexts are examined for evidence of manufacturing techniques and for wear patterns that may signal their use in specific ritual and/or functional contexts. Samples of iron similar in composition to

the meteoric iron used by Ohio Hopewell are used to replicate archaeological specimens via cold working. Replicas are subjected to a variety of functional and repetitive tasks (rubbing, burning, breaking, prying, piercing) to assess how such treatments affect the iron objects, and which marks result from specific actions. The replicas are then compared to archaeological samples to assess similarity in patterning. Experimental approaches such as these can better elucidate past human behavior regarding the use and production of novel raw materials such as the Hopewellian use of meteoric iron.

**Lawlor, Anne**

[246]

*Plant Fiber and Foraging Tools in the Eastern Great Basin*

Analysis of the plant fiber from eastern Great Basin sites show a pattern of continuity in their selection and use over time, suggesting they were regularly preferred for specific tools. Archaeologists currently have no quantitative explanation of what may have influenced forager fiber choices. Explaining why a forager has chosen a particular material for a tool requires knowledge of how that material affects the way the tool works and how it contributes to the forager's capture success. This study examines Great Basin plant fiber usage as it relates to two attributes that were likely important to foragers: processing time and the mechanical properties of the materials. Clarifying a fiber's strength and strain tolerances gives some insight into why they may have been regularly selected. Utilizing experimental processing, ethnographic resources, and mechanical engineering data I evaluate seven plant fibers commonly used in the prehistoric eastern Great Basin. Results show there are significant differences between plant fibers that likely affected the function of important tools such as nets, baskets, and snares.

**Lawrence, Dan (Durham University), Valentina Tumolo (Università degli Studi della Tuscia-Viterbo) and Pertev Basri (Durham University)**

[142]

*Exploring Long-Term Trends in Wealth Inequality in Ancient Southwest Asia*

Investigating how different forms of inequality arose and were sustained is key to understanding the emergence of complex social systems, and archaeology has much to contribute to this discussion. In this paper we investigate inequality in ancient Southwest Asia using a variety of proxies for wealth including household size, storage capacity, and burial goods. Our results suggest that inequality increased from the emergence of farming to the rise of large territorial empires, and we link this to changing forms of social and political organization. We see a step change in levels of inequality around the time of the emergence of the first urban sites at the beginning of the Bronze Age. However, urban and rural sites were similarly unequal, suggesting that outside the elite the inhabitants of each encompassed a similar range of wealth levels. The situation changes during the Iron Age, when inequality in urban environments increases and rural sites become more equal, but less wealthy. This transformation coincides with a shift in landscape investment and organization, including large-scale irrigation projects and settlement dispersal, which likely increased agricultural productivity. Our results allow us to comment on the relationships between different forms of social organization and inequality over time.

**Lawrence, Dawn (National Forests in Florida, USFS)**

[225]

*Chair*

**Lawrence, Dawn (National Forests in Florida, USFS) and Jeffrey Shanks (National Park Service)**

[225]

*More Than a Footnote to History: Rediscovering the Maroon Community at Prospect Bluff*

The fort at Prospect Bluff was not only a post held by the British during the War of 1812 but also, and perhaps most importantly, one of the largest maroon communities in North America. The British

proclamation offering freedom to enslaved people in the United States in exchange for service in the British Colonial Marines made the fort a beacon not only to the enslaved but also to maroons already living free with the Seminole in the relative safety of Spanish Florida. After the destruction of the community in 1816, the details of this site of antislavery resistance were largely forgotten, allowing myth and misunderstanding to flourish. Now, new archaeological investigations at the fort have been used to strip away the inaccuracies rife in both the primary sources and the modern retellings to rediscover the lost story of the diverse community of freedom seekers who used the fort not just for defense but as their home. Taken together with a commitment to further study, connecting the academic community with research opportunities, and working in tandem with descendant communities, these efforts will elevate this highly significant maroon society to its deserved place in national and international history.

Lawrence, Dawn [225] see Shanks, Jeffrey

**Lawres, Nathan (University of West Georgia) and Matthew Sanger (National Museum of the American Indian)**

[9]

*A Glaring Absence: The Need for Native Philosophy in Ontological Archaeologies*

The Ontological Turn has become thoroughly entrenched in archaeological research, providing both new avenues of topical research as well as strong influences over the discipline as a whole. It has provided a needed shift to thinking outside the traditional archaeological box, taking many steps in the right direction. Yet, in the majority of cases, archaeologists involved in ontological studies are theoretically dependent on Western philosophers, which perpetuates and reifies the use of colonial frameworks for understanding an archaeological record created by Indigenous peoples. We argue that by divorcing ontological studies from these Western-centric philosophies and replacing them with Native philosophies that discuss overlapping topics provides one means of helping to decolonize the discipline while also providing more culturally appropriate frameworks for understanding the archaeological record. In this paper we highlight topical areas of overlap between ontological archaeologies and Native philosophies to show where and how these philosophies can provide more appropriate frameworks of understanding.

Lawres, Nathan [181] see Carter, Andrew

Lawres, Nathan [181] see Edmondson, Joel

**LaZar, Miranda (University of Arizona), Joshua Reuther (University of Alaska, Fairbanks Museum of the North), Scott Shirar (University of Alaska, Fairbanks Museum of the North), Liza Mack (Denali Commission) and Nicole Misarti (University of Alaska, Fairbanks)**

[29]

*Cultural and Ecological Relationships between the Unangax̂ and Seabirds on Sanak Island, AK*

Seabirds were, and continue to be, an important resource for the Unangax̂ living in the Aleutian Archipelago, AK. In addition to food, birds were used as raw material for everyday and ceremonial clothing, tools, and objects. They also play an important role in Unangan ontologies, appearing in transformative processes. Sanak Island, the easternmost island in the Aleutian chain, offers a unique opportunity to study the cultural and ecological relationship between the Unangan and seabirds, as archaeological excavations have yielded over 17,000 bird bones that span ~4,000 years of occupation on the island. We examine how temporal changes in environmental conditions may be impacting what seabirds were available to humans, where they could be found on the landscape, and if this influenced the use of birds as a resource in Unangax̂ communities. To do this, we combine zooarchaeological analyses with bulk stable isotope analysis of  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  of nine seabird taxa and compound-specific stable isotope analysis of amino acid (CISA-AA) of Phalacrocoracidae. These multiple datasets will be used to determine shifts in primary productivity, seabird diets, and seabird foraging location. This provides an ecological backdrop for further investigation of human/bird relationships that includes culturally driven, agency-based change.

Lázaro Tovar, Marcela [200] see Ibarra López, Miguel

**Lazazzera, Adrienne and Matthew Nowakowski (Air Force Civil Engineer Center)**

[65]

*Sustainable Curation for Federal Land Managers*

Recent changes in federal policy on curation of archaeological and archival records are prompting federal land managers to reexamine best practices for preserving and sharing valuable national heritage. Some of the policy changes include new guidelines for deaccessioning federal archaeological collections and transitioning to digital information repositories. Such a transition, in particular in the face of climate emergencies, has presented some challenges in determining which practices are sustainable as long-term solutions. This paper presents data across multiple Air Force installations in the eastern United States as a means to identify emerging needs and risks in managing archaeological site data and associated records. We outline the major shifts in policy and their associated impacts, examine the measures adopted to address them in the near-term, and explore potential long-term solutions for sustaining good stewardship.

**Leachman, Robert (University of California, Merced), Justin Jennings (Royal Ontario Museum), Christine Giuntini (Metropolitan Museum of Art), Joanne Pillsbury (Metropolitan Museum of Art) and Beth Scaffidi (University of California, Merced)**

[45]

*Stable Isotope Analysis ( $\delta^{13}C/\delta^{15}N$ ) of Archaeological Feathers from Corral Redondo, Arequipa, Peru*

Feathercrafts were vital to prestige economies of the ancient Americas. Therefore, understanding the mechanisms and sources of feathered textile production can illuminate the nature of the trade networks that supported elite socioeconomic pursuits. In the 1940s, local farmers discovered an unprecedented cache of feathered textile panels wrapped in Wari-style face-neck jars in the mining village of La Victoria, Arequipa, Peru. The panels, most of which are conserved at the Metropolitan Museum of Art, are constructed of Amazon blue and yellow macaw feathers, camelid fiber yarn, and woven cotton backing. They are well-known for being some of the largest intact archaeological featherworks ever recovered and appear to be products of the Wari Empire (ca. 600–1000 CE). However, we still do not understand where these exotic feathers were procured from and why they were deposited in this seemingly remote location. Paleodietary analysis of the feather, yarn, and backing elements ( $n = 25$ ) indicates incredibly diverse diets for the three classes of organisms composited together in these enormous pieces. This suggests that crafters tapped into trade networks that ranged from the Central Andean coast, the highlands, the eastern slopes, and well into the Amazon basin, at least by the Middle Horizon.

**Leader, George (College of New Jersey), Rachel Bynoe (University of Southampton), Theodore Marks (New Orleans Center for Creative Arts), Dominic Stratford (University of the Witwatersrand) and Abi Stone (University of Manchester)**

[212]

*Namib IV: Assessing Acheulean Technology in Relation to Depositional Processes in an Arid Landscape*

Namib IV is an Earlier and Middle Stone Age interdunal pan site in the Namib Desert's Sand Sea. New investigations of this hyper-arid landscape are piecing together the hominin occupations in relation to dry/wet climatic cycles. Hominins at Namib IV occupied the site multiple times using raw material from the !Khuiseb River to knap tools allowing them to exploit the limited resources in this environment. This paper discusses the lithic technology in relation to the deposit formations and its association with fossilized fauna providing a better understanding of hominin movement across this landscape.

Leader, George [114] see Marks, Theodore

**LeBlanc, Megan (University of Florida)****[16]**

Chair

**LeBlanc, Megan (University of Florida)****[16]***The Tacahuay Legacy: Landscape Modification and Reuse on the South Coast of Peru*

The Tacahuay Quebrada has a long geologic history of flood events, as well as human occupation. Around 12,000 years ago, early inhabitants lived along the coastline of this landscape. Through time, people moved away from the ocean to settle along the channel, floodplain, and elevated terraces of the quebrada. In 2022, the IMEND archaeological project investigated the fourteenth-century Miraflores Event at Tacahuay Tambo. This presentation will discuss the history of use and reuse of the floodplain through time. Survey and excavations conducted in the main and northern channel of the Tacahuay Tambo drainage recovered artifacts from precontact to colonial periods. Additionally, excavations of the fields and remote sensing data uncovered a history of reshaping the landscape by both geological events (like El Niño floods) and humans. These changes have turned the Tacahuay landscape into a complex record of human history. Ultimately, this research addresses how dynamic landscapes become legacy landscapes through human modification and memory.

LeBlanc, Megan [71] see Pluta, Paul

Le Cabec, Adeline [252] see Moubtahij, Zineb

**Leckman, Phillip (Statistical Research Inc.)****[215]**

Chair

**Leckman, Phillip (Statistical Research Inc.)****[215]***A View from Above: The Dynamic Human Landscapes of the East Mountains*

The diverse natural and social environments of the uplands east of Albuquerque have shaped equally diverse and overlapping human landscapes. In this paper, a variety of geospatial analyses are employed to trace the dimensions of East Mountain settlement through time, beginning with the region's early farming communities and continuing through the land grant communities of the nineteenth century. By examining the ebb and flow of human settlement in Tijeras Canyon and along the margins of the Sandia and Manzano Mountains, I identify common threads running through the area's communities through time but also identify contrasts hinting at intriguing differences between them. These observations are then considered in terms of the historical and cultural forces that shaped them, as well as the particular lens through which previous archaeologists have interpreted these patterns.

LeCompte, Joyce [43] see Deo Shaw, Jennie

**LeCount, Lisa (University of Alabama), Jason Yaeger (University of Texas, San Antonio),  
Bernadette Cap (University of Texas, San Antonio) and Borislava Simova (Tulane University)****[93]***Tangled Web: Political Pragmatics in the Mopan River Valley*

We explore the pragmatics of Classic Maya politics in the Mopan River valley of western Belize during the Classic period. Drawing on Okoshi-Harada's (2012) reconstruction of sixteenth-century Maya political dynamics and Inomata's (2006) view of polities created through the interaction among social agents in specific

historical and spatial contexts, we see Classic Maya political dynamics as anchored less in territorial control than power over people, as established through face-to-face interactions, public performances, and coercive strong-arm tactics. Rather than a contiguous zone of control, polities were demarcated by a ruler's jurisdictional power over allied or subjugated headmen who had direct control over land and people. Because Maya politics were personal, the ways in which authority was communicated and demands were made to headmen differed, both through time and, at any given time, space. Using data from the closely spaced centers of Xunantunich, Actuncan, and Buenavista del Cayo, we argue that the rulers of Xunantunich—as proxy for the larger kingdom of Naranjo—employed political theater and threat of warfare to become locally dominant early in the Late Classic period. Their control was never complete, however, and within a few generations, older polities centered at Actuncan and Buenavista del Cayo regained independence.

**Lee, Craig (Montana State University), Michael Neeley (Montana State University) and Elizabeth Horton (Yellowstone National Park)**

[94]

*Precontact Animal Migrations and Intercept Hunting Strategies*

Drivelines are a recognizable aspect of indigenously engineered landscapes on the High Plains and Rocky Mountain Front. Frequently associated with bison “kills,” these features are a subject of persistent interest to archaeologists. While the traditional ecological knowledge (TEK) of many Indigenous groups encodes knowledge of driveline systems—and the features have been studied by generations of archaeologists—a disconnect exists in the application of this grounded knowledge to modern animal management. One of the largest driveline complexes in North America lies in the northern portion of the GYE in the Paradise Valley of the upper Yellowstone River drainage to the north of Yellowstone National Park. This complex is an example of an intercept hunting strategy emplaced along a migratory corridor. The level of landscape level engineering undoubtedly reflects one of the routes by which bison (historically), as well as other migratory species, seasonally moved from higher elevation summer grazing to more temperate habitats down valley. In addition to sharing context on High Plains driveline systems, the primary goal of this paper is to serve as a starting point to spur broader awareness, investigation, and understanding of the Paradise Valley drivelines and their relevance to understanding large mammal migration to lower elevation.

**Lee, Gyoung-Ah (University of Oregon)**

[220]

*Discussant*

[220]

*Chair*

Lee, Gyoung-Ah [99] see Fang, Yuan

Lee, Gyoung-Ah [220] see Kim, Habeom

Lee, Gyoung-Ah [220] see Lee, Hyunsoo

**Lee, Hyunsoo (University of Oregon)**

[220]

*Chair*

**Lee, Hyunsoo (University of Oregon) and Gyoung-Ah Lee (University of Oregon)**

[220]

*Niche Construction of Coastal Farming: Archaeobotanical Approach at the Gungokri Site (150 BCE–400 CE)*

This paper examines niche construction and traditional ecological knowledge that was sustained over 550 years along the southern coast in Korea with an example from the Gungokri site. Traditional subsistence method along the coast and islands in Korea was based on a combination of farming and fishery, and we found this resilient strategy extended into the dawn of historical period from 150 BC to AD 400. Our data

comes from plant remains from floated sediments and starch granules extracted from vessels recovered from Gungokri. Our research suggests that Gungokri residents practiced a rotation of crops in wetland and upland farming to reduce soil nutrition loss from seawater and soil erosion. At the same time, they actively harvested wild plants from forest edges and wetlands as well as fishing, shellfish gathering, and hunting. Niche construction and cultural inheritance of complex subsistence based on seasonally variable resources likely increased resilience and flexibility in the coastal adaptation.

Lee, Jiyeon [220] see Lee, Sungjoo

**Lee, Jocelyn (Stanford University)**

[188]

*Moderator*

Lee, Lisa [174] see Martin, Paul

**Lee, Lori (Flagler College)**

[157]

*Discussant*

Lee, Lori [225] see Ibarrola, Mary Elizabeth

Lee, Sujung [220] see Kwak, Seungki

**Lee, Sungjoo, Jiyeon Lee (Kyungpook National University) and Jinwoo Kim (Kyungpook National University)**

[220]

*Island in History or in Ecology? The Construction of Monumental Burials in Ulleung-Island in Korea*

Ulleung Island, a volcanic island located in the middle of the East Sea, is 130 km away from the Korean peninsula. Created 1.4 million years ago, Ulleung is narrow and has limited flat land, yet humans lived intensively on this island from AD 600 to 950. During this period, monumental megalithic tombs were built intensively on the island. The tombs contain earthenware and simple iron tools brought from Silla, as well as gilt-bronze crowns and horse harnesses. Until recently, most archaeologists argued that tombs were built because the central government of Silla occupied Ulleungdo Island in order to control international relations across the East Sea. Yet, when monumental tombs were no longer built in the mainland of Silla, the tradition was revived on Ulleungdo Island and tomb building continued for more than 400 years. Taking into account this historical context, the current study proposes three alternative models based on island ecology to explain the lengthy duration of monumental tomb construction.

**LeFebvre, Michelle (Florida Museum of Natural History), Virginia Harvey (University of Chester), Susan deFrance (University of Florida), Christina Giovias (Simon Fraser University) and Michael Buckley (University of Manchester)**

[70]

*Collagen Fingerprinting (ZooMS) and Caribbean Archaeological Fish Assemblages: Methodological Implications for Historical Fisheries Baselines and Conservation Applications*

The Caribbean Sea is the most species-rich sea bordering the Atlantic. However, its high biodiversity and endemism face unprecedented anthropogenic threats. Although zooarchaeological data broadly indicate

regionally variable Indigenous human impacts on fisheries in the past, elucidating outcomes of human impacts beyond class (e.g., Actinopterygii) is challenging due to the generally low taxonomic resolution of archaeological identifications. Here, we present collagen fingerprinting (Zooarchaeology by Mass Spectrometry; ZooMS) as a method to overcome this challenge, applying it to 1,000 archaeological bone specimens identified morphologically as ray-finned fish (superclass Actinopterygii) from 13 circum-Caribbean sites spanning ca. 3150–300 yr BP. The method successfully identified collagen-containing samples ( $n = 720$ ) to family (21%), genus (57%), and species (13%) level. This study represents the largest application of ZooMS to archaeological fish bones to date and advances future research through the identification of up to 20 collagen biomarkers for 45 taxa in 10 families and two orders. The high-resolution taxonomic identifications of archaeological bone that ZooMS can offer increase the relevance of ancient fisheries data to modern sustainability and conservation efforts in the Caribbean.

LeFebvre, Michelle [76] see Munley, Cameron

**Leishman, Deborah and Jean Pike**

**[137]**

*Analysis of a Bayesian Network Methodology for Site Similarity Assessment*

We present work on a methodology that sits at the intersection of architecture, archaeology, and Bayesian statistics to expand the quantity of architectural data considered in analysis of precontact architectures. Two sites are examined as possible precedents for Pueblo Bonito at Chaco Canyon, NM: the late ninth-century McPhee Pueblo in Colorado and Gila Butte–Snaketown Phase large Hohokam ballcourt at Snaketown, Arizona. Using architectural analysis and Bayesian networks, the degree of each site's similarity to Pueblo Bonito ca. AD 860 is represented as a probability of similarity. Results show both sites have a high similarity to Pueblo Bonito's Western Arc. We focus here on Bayesian Networks as the core of the methodology. These Networks are based on Bayes Theorem, utilize graphical representations of relationships between the multiple architectural variables, and specify a sound propagation method to determine the probability of similarity. Previous use of Bayesian statistics in archaeology mostly supports chronological dating. Bayesian Networks go beyond this and are necessary due to the large number of variables which are both quantitative (ratio of height to width) and qualitative (winter solstice alignment). Our findings indicate the methodology supports a sound probabilistic assessment of similarity that can be easily replicated.

Leitão-Barboza, Myrian Sá [235] see Prestes Carneiro, Gabriela

Leitão-Barboza, Roberta Sá [235] see Prestes Carneiro, Gabriela

**Lemke, Ashley (University of Texas, Arlington), John O'Shea (University of Michigan), Robert Reynolds (Wayne State University) and Thomas Palazzolo (Wayne State University)**

**[106]**

*Virtual Worlds: Underwater Archaeology and Indigenous Engagement*

The Alpena-Amberley Ridge (AAR) is a landform that is now 100 feet underwater in the Great Lakes—but 10,000 years ago, it was a unique dry land environment. Research on the AAR has documented some of the world's oldest hunting features including drive lanes and hunting blinds for targeting caribou. To better understand this submerged landform an immersive Virtual World (VW) model was created which includes AI caribou. The project collaborated with traditional caribou hunters from the Native Village of Kotzebue, Alaska, to assess the veracity of the VW model and to gain insight into the logic and placement of the ancient hunting structures. While the VW has helped investigate the prehistoric landscape, the collaboration with Native Alaskans has generated unexpected avenues to explore by incorporating traditional ecological knowledge into models of past environments and hunting behavior. We are now exploring other uses for the VW suggested by our community partners including its use in K-12 classrooms, and as a means of community

engagement. This project combines archaeological methods with interdisciplinary science, indigenous voices and community-based approaches.

Lemke, Ashley [197] see Nash, Brendan

**Le Moine, Jean-Baptiste (Université de Montréal), Christina Halperin (Université de Montréal), Jose Luis Garrido Lopez (Universidad de San Carlos de Guatemala) and Ryan Mongelluzzo (San Diego Mesa College)**

[64]

*K'anwitznal: Six Years of Cartography at the Site of Ucanal, Guatemala*

Building on the pioneer work of the Proyecto Atlas de Guatemala, the Proyecto Arqueológico Ucanal has considerably expanded the survey and excavations of the site leading to a better comprehension of the transition of the Late to Terminal Classic periods. The site has been surveyed with a combination of approaches including a traditional total station, GPS, UAV for photogrammetry, and small-scale lidar reconnaissance using a UAV. Excavations of 24 distinct architectural groups and city infrastructure zones have also provided a comprehensive portrait of the site's settlement history and urban growth. Unlike other Southern Lowland Maya sites, Ucanal possessed a flourishing population during both the early and late phases of the Terminal Classic period. This paper examines the settlement and hydrologic layout of the site of Ucanal, comparing it with other settlement patterns in the Maya Lowlands, and provides a preliminary analysis of settlement density to better understand Terminal Classic urban developments.

Lennon, Thomas [94] see Stoner, Edward

**Lentz, David (University of Cincinnati), Atasta Flores Esquivel (Universidad Nacional Autónoma de México), Kathryn Reese-Taylor (University of Calgary), Armando Anaya Hernández (Universidad Autónoma de Campeche) and Nicholas Dunning (University of Cincinnati)**

[17]

*Discovery of a Late Preclassic Ceremonial Bundle at the Ancient Maya Center of Yaxnohcah Using Environmental DNA Analysis*

A dark-stained feature near the base of a 1 m thick platform in the Helena complex of the Ancient Maya city of Yaxnohcah was found to contain remains of medicinal plants, a plant containing hallucinogens (likely used for divination), and a plant used in the manufacture of weaponry (spears and bows). The feature was located beneath floor #4 of the platform and was associated with sherds from the Chay tradition (Sierra, Escobal, and Sapote types), chert and obsidian fragments, and a piece of a figurine. A calibrated AMS radiocarbon date of 158 BCE–26 CE was recorded from the same lot and corresponds well with the associated Late Preclassic ceramics. During a subsequent development, a ballcourt was constructed on top of the platform along with several other cut-stone structures. This unusual combination of plants from one context indicates that they were deliberately placed there by the Maya occupants in some kind of ceremony, perhaps as an ensouling ritual for the construction that ensued.

Lentz, David [243] see Detwiler, Natalie

Leon, Roma [20] see Lyons, Natasha

Lepofsky, Dana [207] see Kahn, Jennifer

**Leppard, Thomas (Florida State University) and Sarah Murray (University of Toronto)****[24]***Violence as a Contested Asset and Dynamics of Warrior Ideology at State Edges: Thugs and Harmony?*

Characteristic of many states is a legal monopoly on the legitimate use of violence. Conversely, in small-scale normatively egalitarian societies entitlements to wield violent force are often diffuse and informally adjudicated. State formation thus frequently involves the formalization of institutions that restrict such entitlements to certain discrete social personae. Accordingly, frictions arise within state-forming communities as the few arrogate to themselves a capacity for socially legitimate violence that was formerly possessed by the many. But they should also be evident in societies bordering states that are exposed to the transformative forces emanating from larger polities looming nearby. We consider potential relationships between the process of violence monopolization in premodern states and the “warrior”-like ideologies often apparent at their edges. We propose that the prominence of “warrior ideology” and violent iconographies at state edges likely relates not to an especially violent lifestyle, but rather reflects the increased political fraughtness of a claim to the right to practice violence in sociopolitical environments where such an entitlement has become contested. We describe potential case studies that could support this claim, and discuss the implications for broader interpretations.

**Letham, Bryn (Simon Fraser University), Andrew Martindale (University of British Columbia) and Thomas Brown (University of British Columbia)****[113]***Building Islands on the Northwest Coast: Intertwined Histories of Cultural and Geomorphological Landform Development at Garden Island, Prince Rupert Harbour, Canada*

Some of the most immense anthropogenic shell-bearing archaeological sites in North America are located in and around the Prince Rupert Harbour, on the northern coast of British Columbia. The largest ancient villages have shell deposits upward of 10 m deep and over a hectare in area, resulting from a combination of intentional landform engineering and quotidian accumulation over millennia of occupation. In this densely occupied landscape, the Indigenous occupants transformed shorelines as part of long-unfolding acts of place-making that in turn shaped the social and political landscape of the region. In this paper we explore one of the area’s most iconic (but underreported) archaeological sites: Garden Island (GbTo-23). First excavated in the 1960s and 1970s, the island is essentially constructed entirely of human-deposited shell and is in a very strategic location within the harbor. We compile archival archaeological information with newly collected field data to reconstruct the site’s development within the context of geomorphological and cultural histories unfolding around Garden Island. We demonstrate how people manipulated Northwest Coast coastlines to the degree of literally building islands, and explore how in the modern context of climate change these locations are washing away in the absence of continued human occupation and maintenance.

Leventhal, Alan [175] see Hill, Brittany

**Levin, Maureece (University of Arkansas, Little Rock)****[211]***Chair***Levin, Maureece (University of Arkansas, Little Rock) and Jenny Evans (Valdosta State University)****[211]***Functional Art in the Experimental Archaeology Classroom*

Experimental archaeology is, by definition, a hands-on field. In the undergraduate classroom, students enrolled in experimental archaeology courses typically learn not only the theory and methods behind experimentation to better understand past technologies, but also engage in experimentation themselves. Experiments vary depending on the instructor’s own specializations but are often focused on utilitarian

projects. As archaeologists, however, we know that humans engage in craft not just for tools needed to live, but also as forms of self- and cultural expression. In order to introduce students to outside expertise and to present a viewpoint that brings in art and design in addition to utility, Levin (an archaeologist) brought Evans (an art education professor) into her experimental archaeology class at Valdosta State University to collaborate on basketry and ceramics units. Afterward, students completed a quantitative and qualitative survey on their experiences. In this paper, we describe how this phenomenological learning experience helped students to better understand and appreciate both art and archaeology.

**Levine, Marc (University of Oklahoma)**

[50]

*Chair*

[83]

*Discussant*

**Levine, Marc (University of Oklahoma) and Alex Badillo (Indiana State University)**

[50]

*What Happened on Monte Albán's Main Plaza? Insights from a Socio-Spatial-Sensory Analysis*

Despite increasing scholarly interest in the role of plazas in prehispanic Mesoamerica, we still have a relatively incomplete understanding of what actually occurred in such places. In this paper, we address this vexing question for the Main Plaza at Monte Albán in Oaxaca, Mexico. Our study draws on data from recent fieldwork on the Main Plaza, including drone-aided photogrammetry and terrestrial mapping. We take a "socio-spatial-sensory" approach that includes a comparative and relational study of the Main Plaza and its multitude of smaller, linked plazas and patios. Given the dynamism of social practices, we consider the likelihood that they included movement through and among these linked areas. We seek further insights by examining how people experienced social practices in these spaces through the body and senses. Utilizing GIS-based modeling of intervisibility and acoustics, we measure how well people could have seen and heard one another in particular areas of the plazas. The results provide the opportunity to reflect upon previous ideas about the nature of social practices on the Main Plaza. Furthermore, we argue that the Main Plaza may have been designed, in part, to accommodate and enhance ritual processions.

Levine, Marc [91] see Hepp, Guy

Levine, Marc [163] see Johnson, Sarah

**Lewarch, Dennis (Suquamish Tribe)**

[107]

*Discussant*

**Lewarch, Dennis (Suquamish Tribe)**

[143]

*Restoring the Culture History of the suq<sup>w</sup>abs<sup>ʔ</sup> through Education and Outreach*

In spite of important Suquamish leaders in the historic period, the culture history of the Suquamish People has not been documented accurately in historic and ethnographic records. Suquamish Tribe Archaeology and Historic Preservation Department personnel approach historic preservation in the broadest sense, incorporating archaeology, oral history, genealogy, language, traditional cultural knowledge, and written history in their research to produce a reliable and detailed culture history of the suq<sup>w</sup>abs<sup>ʔ</sup>. Staff members undertake outreach and education in multiple venues and formats to provide accurate cultural information. In the Suquamish heartland centered in Kitsap County, the historic preservation team helped develop interpretive signage summarizing Suquamish culture history, made presentations to community groups, historical societies, and schools, and worked with other tribal government departments to incorporate Suquamish culture history in school curricula of the North Kitsap School District and the tribe's own Chief Kitsap Academy. Personnel made similar efforts in the broader Suquamish ancestral territory throughout

Western Washington, assisting with interpretive signage in the greater Seattle area, giving presentations to a variety of groups, and working with Washington State Ferries to provide cultural information at ferry terminals and in the ferry Suquamish.

**Lewis, Annabelle (University of South Carolina)**

[102]

*Commemoration and Consumption in Mid-Nineteenth-Century Cemeteries of Cazenovia, New York*

Cemeteries and grave monuments serve as important elements in the construction of personal and community identities, contributing to the shaping of public memory. This research utilizes historic documents, site surveys, and GIS mapping to explore the prevalence and significance of nineteenth-century grave monuments signed with makers' marks within the cemeteries surrounding Cazenovia, New York. While mortuary topics are popular among historical archaeologists, recent gravestone studies have more often been the work of art historians. Combining the material culture historian's interest in object biography and micro-history with archaeological methods allows this research to address questions of class and gender performance at both individual and community-level scales, broadening perspectives on commemorative practices in nineteenth-century Upstate New York. Understanding the role of conspicuous mortuary consumption through elaborate grave monuments signed by artisans will also reveal patterns of commerce between residents of Cazenovia and nearby larger cities, such as Syracuse and Utica. These patterns illuminate community ties and individual choices in the adoption of mortuary trends, making clear the complex and interwoven relationships between rural and urban lives.

Lewis, Annabelle [44] see Jones, Eric

**Lewis, Brandon (Santa Monica College), Rui Mataloto (Municipality of Redondo, Portugal), Samantha Lorenz and Hugo Miranda de Morais (University of Lisbon)**

[205]

*The Roman Basilica at Freixo, Portugal: Ongoing Excavations and Current Interpretations Regarding the Role and Regional Significance of this Hinterland Community*

Excavations at Freixo, Portugal, continue to provide substantive data regarding the nature of Roman Imperial organization and decline in the southern Iberian Peninsula. Of specific interest is the role of hinterland communities within the overarching sociopolitical and ideological landscape. Recent discoveries at the Freixo Basilica suggest material trappings indicative of a central place of regional worship. In addition, investigations have identified an unexpected level of associated burials both co-occurring with and postdating primary basilica operation. The discovery of a complete, in situ marble sarcophagus, along with a coffin inscription bearing the Chi Rho Monogram, provide a unique opportunity to understand the ideological complexity and significance of the Freixo Basilica. Current analyses of these burials, along with pending <sup>14</sup>C samples, will highlight the extent to which the Freixo Basilica was reused as sacred Christian space even after Germanic invasion. These data will be embedded within an overall discussion of the role of Roman rural settlements within the overarching Iberian Peninsula.

Lewis, Brandon [205] see Lorenz, Samantha

Lewis, Cecil [43] see Haffner, Jacob

Lewis, Cecil [163] see Johnson, Sarah

Lewis, Cecil [163] see Palacios, Horvey

**Lewis, David (Oregon State University)**

[62]

*Discussant*

**Lewis, David (Oregon State University)****[62]***Researching Traditional Environments of the Kalapuyans*

Tribal scholars have worked to restore and revive tribal cultural knowledge, language, and history of the Kalapuyan peoples. Much has been restored and the tribe is working to instill tribal culture in the next generations. But the tribe's influence has not reached the traditional lands of the Kalapuyans and has been primarily reserved for the reservation. Tribal scholars are now working to relearn the traditional environments of the Kalapuya people, their foodways, annual cultural practices, and philosophies. Recent work has gone toward recovering the history of changes made to the traditional lands of the tribe by settler agriculturalists. Researching and reconstructing what changes were made to water systems and how these interact with cultural fire systems is key toward restoring Kalapuya culture. The Kalapuyans and their environment interacted for more than 10,000 years and to truly restore the culture we will need to restore the environment as well. Current research into these subjects will be presented as well as case studies of reconstructing how and why the valley was changed by settlers.

Lewis, David [62] see Coughlan, Michael

Lewis, Jason [122] see Drees, Svenya

Lewis, Jason [70] see Greening, Victoria

**Lewis, Michael (Confederated Tribes of Grand Ronde) and Yoli Ngandali (University of Washington)****[62]***Does That Belong in a Museum? Conceptualizing Western Oregon Stone Bowls as Potential Funerary Objects*

Stone bowls are common archaeological objects in Western Oregon, often displayed in museum contexts, yet research into the cultural practices associated with stone bowls has been minimal. Recent community discussions at the Confederated Tribes of Grand Ronde concerning the potential funerary context of a decorated stone bowl have prompted a reexamination of the definitions of and appropriate care for these objects. This paper presents a practice-derived categorization of belongings as *miməlust ikta* (funerary objects). The challenges of operationalizing this schema in archaeological contexts and the implications for culturally linked communities, archaeologists, and collections managers are discussed.

Lewis, Michael [69] see Hawks, Dustin

Lewis, Michael [62] see Ngandali, Yoli

Lewis, Michael [72] see Pouley, Cheryl

Lewis, Tim [234] see Marquardt, William

**Li, Jingbo (Stanford University)****[222]***Alcohol, Rituals, and Spirits at the Late Shang Center: Residue Analysis of Ceramic Vessels in Anyang*

In the Bronze Age of China, alcohol practice was an integral part of rituals and the spiritual world as a social agent in hierarchical societies. Multiple types of alcoholic beverages appeared in the earliest writings of the late Shang dynasty some 3,200 years ago. However, little research has been done to characterize how alcoholic beverages were brewed in the Bronze Age and the true use of relevant vessels through scientific analysis. In this study, we analyzed microfossil remains on ceramic vessels unearthed from Yinxi in Anyang, the last capital of the Shang dynasty (1600–1046 BC). Based on the residue analysis, the main fermentation ingredients include millet, rice, Triticeae, tubers, and probably job's tears and beans. Qu starters were used for saccharification and alcohol fermentation. The results provide direct evidence of the production and

consumption of alcoholic beverages in the late Shang and reveal the functions of multiple types of vessels, such as weng vats used for fermentation. The ritual beverages demonstrate that alcohol played key roles in sacrifice, spirits, and ancestral worship in the royal capital, which might help to legitimize the political power and social organization in the formation of early Chinese civilization.

**Li, Li (Max Planck Institute for Evolutionary Anthropology), Sam Lin (University of Wollongong), Jonathan Reeves (Max Planck Institute for Evolutionary Anthropology) and Shannon McPherron (Max Planck Institute for Evolutionary Anthropology)**

[168]

*Integrating Fracture Mechanics into the Design and Implementation of Controlled Lithic Experiments*

The underlying physics of stone tool production is an important component in the studies of lithic technology. The field of fracture mechanics offers rich literature on the basic principles of flake initiation, propagation, and termination. However, results from these fracture mechanics studies are not well applied to interpret the variation observed in the lithic record. Despite the great effort of many experimental lithic studies on the fundamental processes of flaking, there is still a general lack of connection between the basic fracture mechanics of rocks and the flake formation process. Building on the pioneering work of Harold Dibble on mechanical flaking experiments, here we present a series of controlled experiments guided by fracture mechanics to investigate various aspects of force delivery during the knapping process, including the hammer impact angle, hammer size, and hammer speed. Our results demonstrate both the importance and applicability of integrating fracture mechanics theory into hypotheses formation and experimental design of lithic studies to move beyond studying the empirical relationships between different knapping variables. We show that fracture-mechanics-governed lithic experiments provide a more robust framework to quantify knapping behaviors based on basic flaking mechanics and produce results that can be generalized to a much broader context.

Li, Li [168] see Dogandzic, Tamara

**Li, Shuicheng (Sichuan University), Joshua Wright (University of Aberdeen), Rowan Flad (Harvard University), Kuei-chen Lin (Academia Sinica) and Zhanghua Jiang (Chengdu City Institute of Archaeology)**

[202]

*Chengdu Plain Archaeological Survey Culture Distributions: Integration and Interpretation of the CPAS Data*

The Chengdu Plain Archaeological Survey generated two complementary datasets that provide evidence of the distribution of archaeological material across the survey region: surface survey data and coring data. These datasets are combined to create "Activity Areas," archaeological constructs that we argue reflect meaningful loci of past activity that have been identified through one, the other, or both of these survey methods. Our Activity Area catalogue shows the components of these various constructs. In this poster we examine the pattern of finds across the entire survey zone for the three primary chronological phases: Neolithic, Bronze Age, and Qin/Han era and show vignettes that illustrate several noteworthy locales discovered during the survey.

**Li, Yusheng (School of Cultural Heritage, Northwest University)**

[67]

*Review on Archaeological Studies of Sogdian Tombs in China*

This presentation will examine Chinese scholars' archaeological studies toward sinicized Sogdian tombs and relevant discoveries in China during the past 20 years and try to seek its logic, in the meantime, and also its disadvantage and possible breakthrough in the future.

Liang, Jingyu [41] see Goodling, Bailey

Lieb, Brad [64] see Krus, Anthony

**Liebmann, Matthew (Harvard University)**

[110]

*Discussant*

Liendo Stuardo, Rodrigo [172] see Johnson, Lisa

**Lierenz, Julie (Kent State University)**

[219]

*Exploring Archaic Technological Innovations: Comparative Functional Efficacy of Copper and Stone Projectile Points*

The Archaic period in North America was a time of technological innovation and experimentation with new tool materials. Conical copper projectile points appeared in North America during this time and recent radiocarbon evidence shows that they were in use by 7,500 years ago. These points are thought to be the earliest form of copper projectiles used in North America, and archaeological evidence has shown that they are one of the most common copper projectile point forms found in Archaic assemblages. This experimental study was designed to evaluate the comparative functional efficacy of early conical point forms.

Morphometric data was collected from Archaic period copper conical points and stone points from Wisconsin. These data were used to design and produce copper and stone point replicas, which were used to assess comparative functional efficiency in terms of three performance attributes related to projectile efficiency: (1) Penetration: how deeply projectile points enter a target, (2) Accuracy: how consistently the projectile points hit a target, and (3) Durability: how well each point type resists breakage upon impact with hard objects. The results of this study contribute to our understanding of hunter gatherer innovation when presented with novel tool materials.

**Lieverse, Angela (University of Saskatchewan), Rick Schulting (University of Oxford), Vladimir Bazaliiskii (Irkutsk State University), Artur Kharinskii (Irkutsk State Technical University) and Andrzej Weber (University of Alberta)**

[53]

*Hunter-Gatherer Violence in the Middle Holocene Baikal Region: A Probable Massacre at Shamanka II*

Violence was uncommon among the Middle Holocene hunter-gatherers of Siberia's Baikal region (<5%), and lethal violence even less so (~1%). At the site of Shamanka II, however, 11 (or 85%) of 13 interred Early Bronze Age (EBA; 4970–3470 cal. BP) individuals exhibit evidence of perimortem violence, largely in the form of projectile wounds and blunt force cranial trauma. Most victims are male and have multiple (2+) perimortem injuries; at least four males, including a child, have evidence of “overkill.” This level of violence far exceeds what is typical in the region, with radiocarbon dates suggesting that these deaths are consistent with one or possibly two events. A bioarchaeological analysis of the remains, in combination with Bayesian modeling of the radiocarbon dates, leads us to determine that the EBA burials at Shamanka II represent a probable massacre event/s. Stable isotopic analyses (C, N, Sr) suggest that the victims are local. Massacres among prehistoric hunter-gatherer populations, while not unknown, are rare. Within the context of generally low levels of violence in the region, the EBA massacre at Shamanka II raises questions about the nature of the community and its interactions with surrounding groups.

Lieverse, Angela [53] see Macleod, Ruairidh

Lightfoot, Kent [152] see Byram, Scott

Lillquist, Karl [70] see Lubinski, Patrick

**Lim, Jonathan**

[169]

*Nuna Nalluituq / The Land Remembers: Spatial Technology and Community Engagement to Protect Alaska Native Heritage Landscapes*

Southwest Alaska's Yukon-Kuskokwim (YK) Delta, where two immense salmon-bearing rivers flow into the Bering Sea, is the ancestral homeland of the Yup'ik people. This biodiverse subarctic tundra wetland is a landscape in constant flux from the annual cycle of flooding, silting, and erosion. However, the effects of unmitigated climate warming have accelerated landscape change to an unprecedented degree, threatening modern infrastructure, heritage, and traditional Yup'ik subsistence lifeways. There is therefore a need to develop new strategies to assist communities in monitoring these at-risk landscapes. Based on fieldwork conducted with the community of Quinhagak, it will be demonstrated how high-density survey and measurement, archival spatial datasets, and community engagement may be deployed to (1) identify undocumented heritage sites and (2) monitor known ones. For example, multispectral false-color composites and digital elevation models derived from unpiloted aerial vehicles are best used in tandem to locate precontact sod-built structures. An experimental points-based system that considers ethnographic accounts and traditional place-name etymology alongside topography may be used to model past subsistence use. Automated change detection and visual inspection of archival imagery are effective for identifying areas of the landscape that are most endangered from erosion.

**Lin, Audrey (Smithsonian National Museum of Natural History), Liz Hammond-Kaarremaa (University of Vancouver Island), Christina Stantis (Smithsonian National Museum of Natural History), Hsiao-Lei Liu (Smithsonian National Museum of Natural History) and Logan Kistler (Smithsonian National Museum of Natural History)**

[245]

*"Mutton" and the Paleogenomics of Coast Salish Woolly Dogs*

Prior to European colonization, Indigenous Coast Salish peoples in the Pacific Northwest traditionally raised a long-haired domestic dog breed to harvest its hair for weaving. The decline of dog-hair weaving has been attributed to the introduction of machine-made blankets by British and American trading companies in the early nineteenth century, and these "woolly dogs" disappeared by the late nineteenth century. However, woolly dogs were a form of wealth and status, and dog hair blankets were items of prestige. Here, we analyzed the genome, isotopic signatures, and archival records of "Mutton," the only known woolly dog pelt, and contextualize these approaches using ethnographic interviews to better understand the history, importance, and decline of these dogs. Genomic analyses reinforce its Indigenous North American origins, demonstrate the reproductive isolation needed for the woolly phenotype, and provide insights into the genetics of woolliness. Traditional knowledge shared through ethnographic interviews affirm that deliberate persecution of Coast Salish people and culture by colonial government actions, and not simple economic forces, was largely responsible for the loss of woolly dogs. We demonstrate how community-led research questions coupled with Western science contribute to reclaiming Coast Salish cultural traditions, highlighting the successes and ingenuity of Indigenous Knowledge systems.

**Lin, Kuei-chen (Institute of History and Philology, Academia Sinica)**

[202]

*Chair*

**Lin, Kuei-chen (Institute of History and Philology, Academia Sinica) and Zhiqing Zhou (Chengdu Institute of Cultural Relics and Archaeology)**

[202]

*Fieldwork Prior to the CPAS and the Influence of CPAS on Recent Fieldwork*

This poster examines archaeological fieldwork and discoveries made in the Chengdu Plain prior to the launch

of the Chengdu Plain Archaeological Survey (CPAS) project in 2005. We pay particular attention to pre-Qin sites found in key areas of CPAS. Since the 1980s, due to the urban development of the Chengdu City and the promotion of pre-Qin archaeology, a large number of such sites have been discovered. We describe the survey and excavation methods used in the fieldwork and investigate the characteristics and spatial distribution of these sites. We then discuss how post-CPAS archaeological fieldwork has been influenced by CPAS, and enumerate findings from systematic across the Chengdu Plain and western mountains.

Lin, Kuei-chen [202] see Flad, Rowan  
Lin, Kuei-chen [202] see Li, Shuicheng

Lin, Qiang [109] see Kelley, Kathleen

**Lin, Sam (University of Wollongong)**  
**[168]**

*Revisiting the Rolland and Dibble Synthesis: The Emergence of Artifact Retouch and Artifact Density Variability in Paleolithic Assemblages*

The Rolland and Dibble synthesis was an ambitious attempt to reframe the interpretation of Middle Paleolithic variability. The model postulates that Middle Paleolithic assemblage variability is continuous in nature, driven principally by raw material availability and occupation intensity. As occupation intensity increases, the model predicts a greater degree of lithic utilization, leading to the production of more flakes per core as well as more retouched artifacts. Intuitively, this prediction translates to an expectation that artifact density should correlate positively with the proportion of retouched objects. However, empirical observations have repeatedly described the opposite, that Paleolithic assemblage retouch frequency generally correlates negatively with artifact density. In this paper, I show that the Rolland and Dibble synthesis can explain the empirical negative relationship if we introduce two new elements to the model: flake size distribution and flake selection probability. Using simulation, I demonstrate that the negative correlation between retouch frequency and artifact density can emerge organically through a relatively simple flake selection process, without additional parameters of mobility or technological strategies. The results suggest the possibility that the widely described relationship between artifact density and retouch frequency among Paleolithic assemblages reflects a fundamental aspect of assemblage accumulation, driven primarily by place-use intensity.

Lin, Sam [168] see Braun, David  
Lin, Sam [168] see Li, Li

Linderholm, Anna [43] see Johnson, Taryn  
Linderholm, Anna [121] see Jones, Lauren

Linduff, Katheryn [141] see Rubinson, Karen

**Linford, Samantha (Los Alamos National Laboratory), Kelsey Reese (Los Alamos National Laboratory) and Danielle Huerta (Los Alamos National Laboratory)**  
**[224]**

*Cavates and Roomblock Pueblos: A Reexamination of Site Types on the Pajarito Plateau*

Cavates and mesa-top pueblo roomblock sites on the Pajarito Plateau have generally been studied as separate site types. This paper aims to explore what archaeologists can learn by studying mesa-top pueblos and cavates as one community based on seasonal living. Ethnographic accounts have mentioned how communities would live in the cavates in the winter and live in the mesa-top pueblos in the summer. Studying these sites as one community might be able to give archaeologists a more accurate population estimate of the Pajarito

Plateau—specifically within the Los Alamos National Laboratory boundary. This research aims to use Tsirege as a test site to understand the connection between cavates and mesa-top pueblos in regard to room density and population size based on seasonal living. This paper is a brief case study to examine the potential for understanding cavates and mesa-top roomblocks as one community rather than separate site types.

**Ling, Johan (Univeristy of Gothenburg)**  
[213]

*Discussant*

Ling, Johan [92] see Montenegro, Alvaro

Linstatder, Jorg [2] see MacDonald, Brandi

Lipo, Carl [207] see Rieth, Timothy

**Lippert, Dorothy (National Museum of Natural History)**  
[14]

*Discussant*

**Lipps, Hannah and Erik Otárola-Castillo (Purdue University)**  
[73]

*Looking for Lomas*

Loma Oases are ecosystems unique to the arid central-western coast of South America, formed by the winter fog that accumulates on the slopes of the Andean foothills. They become seasonal homes to a unique and diverse suite of plant and animal species. Consequently, archaeologists hypothesize that Loma environments were vital to prehistoric Peruvian subsistence and settlement practices. Andean archaeologist Frédéric Engel emphasized this “Loma hypothesis” in his 1980s work. Later research has lent support; however, data are limited. This hypothesis predicts that if Lomas were essential to past people living on the Peruvian coast, then archaeological remains of the prehistoric settlements should be located near ancient Lomas. We used Geographic Information Systems and statistical inference to evaluate this prediction and the relationship between archaeological sites and Loma locations. We digitized Engel’s archaeological site maps from Ica, Peru, and georeferenced the archaeological site locations therein. We used these and the locations of known modern and ancient Lomas and variables known to facilitate Loma formation to model the relationship between Loma and archaeological site location. Model results provide insight into how Pleistocene humans chose their settlements and the types of non-maritime resources to which they would have access near the coast.

Lipps, Hannah [176] see De La Puente-León, Gabriela

**Lira-Lopez, Yamile**  
[183]

*Un basurero prehispánico en el valle intermontano de Maltrata, Veracruz*

Un basurero es parte de la vida cotidiana de una familia, allí se va depositando todos los desechos que en un tiempo fueron de utilidad, tanto restos de comida como utensilios. Por ello el hallazgo de un basurero prehispánico en un contexto habitacional es de gran importancia para reconstruir parte de la vida cotidiana de una familia: que tipos de vasija utilizaba, que herramientas, que animales consumían de alimento, entre otros materiales. El material que aquí se presenta corresponde al encontrado en un basurero de una unidad

habitacional en el sitio arqueológico denominado Rincón de Aquila, en el valle de Maltrata, Veracruz, ubicado entre los estados de Veracruz y Puebla. Este asentamiento inicia su poblamiento desde el periodo Preclásico, durante el Clásico aumenta su población y extensión siendo el sitio principal de este periodo en el Valle considerado como una ruta de comunicación entre la Costa y el Altiplano. Compartir esta información es importante pues la zona intermontana del centro del estado de Veracruz prácticamente solo se conoce por las investigaciones del Proyecto Arqueología del valle de Maltrata (UNAM-UV) y por algunos rescates del Centro INAH Veracruz.

Lira-Noriega, Andrés [223] see Chiou, Katherine

**Lis, Monika (University of Warsaw)**

[139]

*Analysis of Physical Activity Pattern of Women from the Castillo de Huarmey Mausoleum, Peru*

This paper seeks to test the hypothesis that the elite individuals from the main chamber in the mausoleum in Castillo de Huarmey, Peru, functioned as specialized weavers. The sources available for the precolumbian Middle-Andes indicate the presence of *aqllacuna* (chosen women) who dedicated themselves to luxurious textile production. The burial in the main chamber of the mausoleum consisted of numerous grave goods belonging to 58 aristocrats accompanied by six human sacrifices. The grave goods included weaving instruments, such as spindles, spindle whorls, and the remnants of looms, as well textiles in various stages of completion. According to bone functional adaptation, repeatable activities such as weaving and spinning should leave visible traces on the bones. Osteological analyses were performed with a focus on skeletal indicators of physical activity. First, upper limbs enthesal changes were recorded. For the fibrocartilaginous entheses, the methodology developed by Henderson et al. (2016) was used, and for the fibrous entheses, the Hawkey and Merbs (1995) method was used. Following this, the analysis of upper limbs' cross section geometry properties was conducted. As a result, it is possible to approximate what activities were performed by female aristocrats from Wari culture.

Littman, Robert [126] see Silverstein, Jay

**Litynski, McKenna (University of Wyoming) and Todd Surovell (University of Wyoming)**

[118]

*Microfauna Analysis at the La Prele Mammoth Site (48CO1401): Implications for Clovis Diet and Paleoenvironments*

Most of the research focusing on Late Pleistocene hunting has been tailored to examining megafauna, with microfauna receiving little attention in the Clovis archaeological record. This project examines the microfauna remains recovered from the La Prele Mammoth Site (48CO1401). La Prele is an open-air Clovis mammoth camp and kill site located in Converse County, Wyoming dated to ~12,900 years ago. Analyzing the microfauna recovered from La Prele provides the opportunity to infer if these small animals constituted as prey that aided in subsistence or if the microfauna naturally occur on the landscape. To compliment my traditional osteological identifications, this research incorporates Zooarchaeology by Mass Spectrometry (ZooMS) analysis. The peptide sequences that result from ZooMS analysis can be used to identify microfauna species in bone fragments where morphological characteristics did not survive in the archaeological record. Results will not only improve our understanding of Clovis subsistence and fill a major gap in the archaeological record but also shed light on the generalist versus specialist theoretical debate in the context of Late Pleistocene archaeology.

**Litzkow, Jamie (Bureau of Land Management)**

[143]

*Beyond Clickbait: Contextualizing Our Shared Heritage in Divisive Times*

Federal archaeologists are in a unique position to inform the public perception of historic issues, archaeological research, and community-specific concerns. Respecting the viewpoints of diverse, often

conflicting, stakeholders forces multiple use agencies to think and act in creative ways as responsible stewards of the “resource.” Recent flashpoints of cultural conflict at the national level illustrate an urgent need for a more informed public regarding the dynamic values of historic places, traditional ecological knowledge, and shared landscapes. With an increase in the interest, use, and investment in public lands, finding common ground is now more essential than ever. Efforts undertaken by the Bureau of Land Management (BLM) to foster a more contextual understanding of our shared national heritage will be highlighted. Specific examples of events organized by the BLM in cooperation with local scholars, tribal representatives, associations, historians, agency specialists, and cultural resource management professionals will be detailed, illustrating the myriad of ways we can work together to reach the public in more intimate and meaningful ways.

**Liu, Cheng (Emory University)**

[232]

Chair

**Liu, Cheng (Emory University), Nada Khreisheh (Ancient Technology Centre), Dietrich Stout (Emory University) and Justin Pargeter (New York University)**

[232]

*Detecting Skill Level and Mental Templates in Late Acheulean Biface Morphology: Archaeological and Experimental Insights*

Despite the extensive literature focusing on Acheulean bifaces, especially the sources and meaning of their morphological variability, many aspects of this topic remain elusive. Archaeologists cite many factors that contribute to the considerable variation of biface morphology, including knapper skill levels and mental templates. Here we present results from a multidisciplinary study of Late Acheulean handaxe-making skill acquisition involving 30 naïve participants trained for up to 90 hours in Late Acheulean style handaxe production and three expert knappers. We compare their handaxe to the Late Acheulean handaxe assemblage from Boxgrove, UK. Through the principal component analysis of morphometric data derived from images, our study suggested that knapper skill levels and mental templates have a relatively clear manifestation in different aspects of biface morphology. The former relates to cross-sectional thinning (PC1), while the latter refers to handaxe elongation and pointedness (PC2). Moreover, we also evaluated the effects of training using the data from a 90-hour-long knapping skill acquisition experiment. We found that reaching the skill level of modern experts requires more training time than was permitted in this extensive and long-running training program.

**Liu, Chin-hsin (California State University, Northridge), Emily Darlington (California State University, Northridge) and Michael Mathiowetz (Independent Scholar)**

[102]

*Bioarchaeology of Postclassic West Mexico: A Research Framework and Preliminary Results*

Over the past three millennia, West Mexico’s complex cultural developments and social transformations have characterized it as a unique entity pivotal in the histories of population admixture and cultural transmission, producing long-lasting effects still evident in Mesoamerica. During the Early to Middle Postclassic periods (850/900–1350s CE), polities in West Mexico underwent long-term transformation in waves of integration that shaped the course of regional history. Past studies on Postclassic Mesoamerica often adopted a macro-regional view evaluating topics such as artifact dispersal, ceremonial structures, and polity boundaries. While shedding light on the region’s overarching inter-community structure, this approach overshadowed the agency held by individuals and communities, a fundamental level on which actions and choices were initiated. We present a multiphased bioarchaeological project on nine human skeletal assemblages from across West Mexico, with a particular focus on sites that pertain to the Aztatlán-tradition sphere, to highlight individuals’ life experiences as reflected in skeletal morphology and chemical signatures. The project aims to understand how people managed and mitigated opportunities and challenges associated with sociocultural changes during this dynamic period. Preliminary demographic and osteobiographical results will be discussed as they are the first steps toward a nuanced reconstruction of individual daily social and biological behavior.

Liu, Emily [41] see Melton, J. Anne

**Liu, Hailin, Xin Yu and Chunxue Wang**  
[70]

*A Study on the Animal Remains Unearthed from the Jirentaigoukou Site in Nilka, Xinjiang, China*

The Jirentaigoukou site in Nileke, Xinjiang is an important Bronze Age site in the Ili River area of Xinjiang. From 2015 to 2016, the Xinjiang Institute of Cultural Relics and Archaeology excavated the Jirentaigoukou site and cemetery in Nileke County. A total of more than 1,000 animal skeletons were unearthed in the two excavation years, all of which were mammals. The species mainly consisted of sheep, cattle, and horses. After analysis, various animals in the site were found to have been domesticated. Animal skeletons unearthed from the site show the residents of the area were mainly engaged in animal husbandry.

Liu, Hailin [122] see Yu, Xin

Liu, Hsiao-Lei [245] see Lin, Audrey

**Liu, Li (Stanford University)**  
[222]

*Serving Alcoholic Beverages to the Ancestors in Neolithic China*

China has a long history of alcoholic production and consumption, and the earliest evidence of fermented beverages has been recovered from pottery vessels about 9,000 years ago. Many drinking vessels have been found in mortuary contexts, suggesting that alcohol was closely related to ancestral worship ritual. In this talk I will discuss the origin, development, and variation of mortuary ritual associated with alcoholic consumption, as well as the social implications of such practice in Neolithic China.

Liu, Xinyi [29] see Diaz, Lucia

Liu, Xinyi [25] see Sun, Yufeng

**Livesay, Ali (Los Alamos National Laboratory)**  
[72]

*“Glowing” Reviews: Results from the First UNM Field School at Los Alamos National Laboratory*

During the summer of 2022, Los Alamos National Laboratory partnered with the University of New Mexico to host a field school for the first time. This field school focused on the non-destructive side of compliance work, and sought to build foundational survey, site identification, and recording skills, that would help launch the students in their chosen archaeology careers. As a working National Laboratory, this partnership was not without its challenges. All in all, it was a successful first run that resulted in numerous interesting conversations with engaged young archaeologists, thousands of steps taken, many acres surveyed, and sites recorded.

Livingood, Patrick [99] see Regnier, Amanda

**Livingston, Christina (California State University, San Bernardino), Matthew Des Lauriers**  
**(California State University, San Bernardino) and Claudia Garcia-Des Lauriers (California State**  
**Polytechnic University, Pomona)**  
[92]

*Seascapes and Society on the Forgotten Peninsula: The Watercraft of Baja California, Mexico*

Baja California is a landscape formed by visually endless coastlines fringing a narrow spine of mountains and

deep desert canyons with their hidden oases. The earliest European images presented of this original “California” depicted it as an island, separate from the adjacent continent. While this mythical geography was eventually revealed to be a literary creation, the ways in which this landscape shaped its human inhabitants were not without consequence. No human group has ever set foot on the Baja California Peninsula without knowing the sea. This is evidenced by the settlement of the peninsula by maritime groups since at least the Terminal Pleistocene. In fact, the use of watercraft to fish significant distances from shore even in geographic contexts that would not have required such craft to reach further suggests their role not only in early social and ecological systems but also in initial arrival. The social and human ecological systems created over thousands of years reveal insights into how a maritime way of life is distinct from more terrestrially bound systems in terms of transportation, community organization, interaction networks, and cosmology. In Baja California, the sea both binds and transcends time, space, and society for its human inhabitants.

**Liwoz, Chester (New Mexico Highlands University; Mesa Prieta Petroglyph Project) and Arthur Cruz (Ohkay Owingeh [San Juan Pueblo])**  
[105]

*New Media, Old Stories: Democratizing Archaeology with Open Source Methods in Virtual Heritage Management at Northern Rio Grande Pueblos*

Covering 50 square miles of tablelands in northern New Mexico, Mesa Prieta (Black Mesa, Mesa Canoa) is an exceptional petroglyph landscape with remarkable historical and cultural significance. As a core part of its mission, the nonprofit Mesa Prieta Petroglyph Project’s (MP3) has long partnered with descendant communities, particularly Tewa Pueblos. A recent outgrowth of this partnership has been developing a virtual reality tours project that engages Pueblo youths and community elders in and throughout the creative process. Per community interests and considerations for sensitivity, the project’s scope currently focuses on telling stories of migration through immersive virtual reality experiences of related petroglyph iconography. The end-user experience benefits from MP3’s Summer Youth Intern Program (SYIP), which engages high school aged Indigenous and Hispano/a youths in a field school–like archaeological curriculum for college credit. In addition to survey and recording methods, the SYIP interns learn photographic and programming techniques to make photogrammetric models and spherical panorama settings. These depictions are integrated into a basic, web-based, open source virtual tours platform (Pannellum) with oral histories provided by community partners (Arthur Cruz, Ohkay Owingeh) and Indigenous-authored primary sources (Alfonso Ortiz and Tessie Naranjo) to create a lightweight, interactive, multicursal, virtual reality learning experience.

Lobato, Thomas [101] see Sherfield, Anne

**LoBiondo, Matthew (UC Santa Barbara)**  
[6]

*Why These Beads? Color Symbolism and Colonialism in the Mohawk Valley*

Scholarship has long recognized the significance of glass beads in postcolumbian North America. For northeastern Native Americans, beads were relationally entangled within sociopolitical relationships and the spiritual world. In the Mohawk Valley, bead types and colors have been useful temporal markers, but their social and spiritual significance has received less attention. This paper seeks to address the metaphysical significance of glass beads from the Veeder (Fda-2) site, a late seventeenth-century Mohawk village. Through the interpretation of color symbolism, the Veeder bead assemblage can be contextualized alongside multiscale phenomena such as colonialism, disease, warfare, and the large-scale emigration of Catholic Mohawks. Indeed, the selection of specific bead colors can shed light on the villages’ inhabitants state of being and provide a way to further understand the intersection of colonialism and Native American interactions.

**Locker, Angelina (George Mason University)****[134]***Ancient Maya Placemaking: An Isotopic Assessment of Ancestry, Memory, and Body Partibility*

Migrations are a key feature of human populations past and present, and people moved across landscapes regardless of cultural affiliation, hierarchical structures, or place of birth. But, what does it mean when individuals and/or pieces of their remains are moved elsewhere posthumously? This paper builds upon discourse centered on social memory and place making to investigate how the of the fragmentation and subsequent movement of pieces of bodies after death interplays with ancient Maya settlement, ancestry, and legitimization. Using strontium and oxygen isotopes, I assess an Early Classic elite tomb at the site of Dos Hombres in northwestern Belize and argue that the ancient Maya incorporated both local and nonlocal individuals into memory, placemaking, and legitimization practices.

**Lockett-Harris, Joshuah, Kathryn Reese-Taylor (University of Calgary), Felix Kupprat (Universidad Nacional Autonoma de Mexico), Armando Anaya Hernández (Universidad Autonoma de Campeche) and Deborah Walker****[189]***Heart of an Ancient Maya City: Investigations of the Central E Group at Yaxnohcah, Campeche, Mexico*

Ancient Maya E Groups were important loci of sociopolitical continuity, sociocultural change, and social memory across millennia of lowland Maya civilization. As sustained generational foci of sociopolitical machinations and social memory, the built environment and significance of E Groups would have been continuously generationally reformulated to meet contemporary exigencies. As such, alteration and/or destruction of such sociopolitically significant built environments may reflect historical inflection points, while expansion and elaboration may reflect periods of relative sociopolitical stability and continuity. Recent investigations at the ancient Maya center of Yaxnohcah have reconstructed a two-millennia-plus (900 BCE–1250 CE) occupational history of the central E Group complex, with construction events or ritual activities evidenced in nearly every major period. Excavation of the eastern structure of Yaxnohcah's E Group demonstrates that the form and dimensions of this structure changed significantly across generations, reflecting periods of intensive use, remodeling, and expansion, as well as possible violent destruction, abandonment, and subsequent reoccupation. This paper will situate these events in Yaxnohcah's history, discuss the significance of these new findings in relation to broad lowland sociocultural trends, and speculate as to Yaxnohcah's relationship with its regional neighbors, El Mirador and Nakbe, and later in time to Calakmul.

Loendorf, Larry [241] see Castañeda, Amanda

**Logan, Amanda (Northwestern University)****[208]***Discussant***Logan, Amanda (Northwestern University)****[51]***Racism, Climate Change, and More-Than-Human Agency in Tropical West Africa*

In this paper, I weave together archaeological and historical narratives about two plants in West Africa to explore the pitfalls and potentials of multispecies approaches. I argue that in West Africa, both individual plants and climate change have often been accorded more agentive power than African people in historical and archaeological research. In my first case study, I consider how human interactions with economic plants, particularly oil palm, have often been minimized in favor of arguments that over-emphasize climate change and local ecological dynamics. In my second case study, I reveal how maize's adoption as part of the Columbian Exchange has overshadowed the agricultural capabilities of African farmers. Both cases portray a tendency to underplay the ability of African peoples to modify their environments, contrary to empirical data

demonstrating quite the opposite. I consider the racist implications of according more agency to plants than to humans, as well as how (and if) multispecies frameworks can move forward in tropical West Africa.

**Lohse, Jon (Terracon Consultants Inc.), Derek Hamilton (SUERC), Leslie Bush (Macrobotanical Analysis), Melanie Nichols (Legacy Cultural Resources) and Jenni Kimbell (Terracon Consultants Inc.)**

[82]

*Recent Investigations at 41AN162, a Middle Caddo Site in East Texas: Implications for Late Mississippian Settlement-Subsistence Behavior and Precision Dating*

Recent investigations at 41AN162, sponsored by the Texas Department of Transportation, exposed and documented several features associated with Caddo ceramics in an upland, non-aggrading landform. Historic-period plowing and extensive bioturbation has resulted in substantial reworking of site sediments and associated archaeological remains. However, extensive high-resolution AMS radiocarbon dating of short-lived botanical remains, including maize, hickory, walnut, and cane, has produced an occupation profile that may reflect a single generation occupation. A single nearby feature slightly post-dates this occupation, suggesting shifting residential patterns. We review this site's geoarchaeological context, features, macrobotanical contents, and Bayesian age modeling of almost two dozen dates, and explore implications for Middle Caddo maize-based settlement-subsistence behavior as one of many regional patterns that defined Late Mississippian society in the American Southeast.

Lohse, Jon [239] see Jones, Shelby

**Loiselle, Hope, Logan Kistler (Smithsonian Institution), Michael McGowen (Smithsonian Institution), Mike Etnier and Ben Fitzhugh (University of Washington)**

[71]

*Marine Mammal Hunting in the Kuril Islands: Zooarchaeological and Genetic Insights*

People have inhabited the NW Pacific Kuril Islands for millennia, supported by the productive marine and coastal environments. Here, we build upon previous faunal analyses that examined biogeographical patterns in faunal exploitation by conducting a chronological analysis, grouped by cultural period (Epi-Jomon, Okhotsk, Ainu and Historic). Specifically, we focus on temporal and regional trends in marine mammal hunting that centered on species such as sea lions, fur seals, seals, sea otters, and porpoises. Having established an overview of the role of sea mammals in Kuril harvesting practice through time, we then analyze ancient DNA to better understand the history of human harvesting pressure on Steller sea lions. We analyze mitogenomes from archaeological, historic, and modern Steller sea lions from the Kurils and southern Sea of Okhotsk using demographic reconstruction and diversity measure methods. The result will allow us to assess whether Steller sea lions in the Kurils were demographically stressed in the late Holocene due to human hunting or if their population remained stable despite sustained hunting pressure. Ultimately, we aim to establish a historical ecological baseline for marine mammal communities in the region and to understand the dynamic relationships between humans and pinnipeds more broadly.

Lombao, Diego [21] see Falcucci, Armando

Lombard, Marlize [152] see Park, Gayoung

**London, Maia, Shaun Nelson and Ellyse Simons**

[209]

*Effective Tribal Consultation and Engaging Partnerships: A Utah DoD Collaboration*

In 2010, the Utah Army National Guard (UTARNG) partnered with Hill Air Force Base and Dugway Proving Ground to conduct annual and quarterly meetings with Tribal governments throughout much of the intermountain West. Since then, the partnership has grown to include Tooele Army Depot. The partnership

allows each installation to pool their resources to increase the effectiveness of their Tribal consultation programs; doing so fosters consistency and collaboration between installations and Tribal governments. The UTARNG also frequently partners with local Tribal governments on projects and initiatives outside of the traditional realm of consultation.

Longstaffe, Fred [3] see Buckley, Gina  
Longstaffe, Fred [125] see Whittington, Stephen

**Longstaffe, Matthew (University of Calgary), Kathryn Reese-Taylor (University of Calgary), Armando Anaya Hernández (Universidad Autónoma de Campeche) and Felix Kupprat (Universidad Autónoma de Mexico)**

[147]

*The Marketplace Next Door: Socioeconomics at Ximbal Che', an Intermediate-Elite Maya Household at Yaxnohcah (Campeche, Mexico)*

This paper presents new data from excavations at Ximbal Che', an intermediate-elite residential group at the ancient Maya city of Yaxnohcah, located in southern Campeche, Mexico. Households have for decades been recognized as important loci for production, consumption, and social reproduction in ancient Maya societies. In recent years, studies of intermediate-elite households have documented a surprisingly diverse array of social, political, and economic strategies that have enhanced our understanding of urban social organization. Here we present preliminary results of one such study, designed to understand the relationship between Ximbal Che' and the Sakjol neighbourhood marketplace, which is adjacent to this residential group. To date, excavations at Ximbal Che' reveal a history of construction and occupation spanning the Late Preclassic (400–200 BC) through to the Late Classic (AD 650–850) and recovered artifact assemblages have supplied a glimpse into the daily life of this household. We consider these lines of evidence to evaluate how the socioeconomic activities and practices undertaken by Ximbal Che' changed throughout its history and consider the role this household may have played in the organization and operation of the next-door Classic period Sakjol marketplace.

Lopez, Claudette [142] see Green, Adam

**Lopez, Kirsten (Oregon State University & PaleoWest)**

[252]

*Chair*

**Lopez, Kirsten (Oregon State University & PaleoWest)**

[252]

*Successful Sourcing of Plant Material from Paisley Caves, Oregon: Results*

Plant and animal perishable remains are not uncommon in dry cave archaeological contexts, which have made significant contributions to archaeological knowledge in recent years. Textiles (including basketry, cordage, woven, knotted, or plaited products) make up a considerable portion of the perishable archaeological record in these contexts, much of which is created from plants and plant fibers in the northern Great Basin. Using <sup>87/86</sup> strontium isotopes, I was able to successfully determine the geographic locations of harvest for five experimental specimens excavated from the Paisley Caves Younger Dryas and Early Holocene levels (12.9–8 ka). In this presentation, I will discuss my results.

**López, Raúl (Universidad Autónoma de Yucatán) and Gloria Hernández (Centro de Investigación Científica de Yucatán)**

[58]

*Reappraising Mobility during the Ninth and Tenth Centuries CE among Lowland Maya Populations: A Bioarchaeological and Isotopic Approach*

Conventional inferences of Maya mobility have been based on cultural exchange. The isotopic composition measured in human skeletal remains provides a direct measure of past peoples' movements. Founded on published isotopic datasets across the Maya area, in this contribution we reappraise human residential shifts and the possibility of migration during the Classic period and the initial stages of the Postclassic era. Comparing the strontium isotopic signatures ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) from the dwellers buried during the Early and Late Classic with those deposited during the Terminal Classic, we discuss residential mobility trends toward and during the Maya collapse. Our results show complex regional mobility dynamics with a noticeable increase from the Early to Late Classic period and, subsequently, a seemingly drastic decrease during the Terminal Classic phase. We discuss this trend among the remnant populations of the inner Petén and further examine the directionality of residential shifts among those population segments that appear on the move. During the time of the collective crisis, nonlocally born females and males appear to have coped with residential shifts and permanence in a distinctive fashion.

**López, Rocío**

[25]

Chair

**López, Rocío**

[25]

*Preliminary Geoarchaeological Analysis of the Colina Da Monte Site (Rocha, Uruguay)*

A preliminary analysis of the geoarchaeology of the "Colina Da Monte" mound complex is presented here, a site located in the northern sector of the Sierra de los Ajos, Department of Rocha, Eastern Uruguay. Little is known about this sector of the Sierra, as past research focused largely on environmental conditions that possibly directly influenced cultural mound-building processes. Little attention has been paid to the extent to which humans experienced and shaped the landscape as places over time where various practices and interactions between people and changing material conditions took place. A wide-coverage subsurface survey was carried out with auger coring that allowed a first evaluation of the stratigraphic history and the formation processes of the site, the practices involved in its formation, and the effects that these practices had on the materiality of the place. It can be concluded that Colina Da Monte presents a complex dynamic of site formation processes. The analysis of the recovered material culture is in progress, as well as textural, radiocarbon, and chemical analysis of the soil that will provide more information on the processes that generated Colina Da Monte as a place of human activity with a complex spatiality and temporality.

López Bravo, Roberto [218] see George, Miranda

López Hernández, Karina [133] see Takatsuchi, Ryohei

López Lillo, Jordi [142] see Cruz, Pablo

**Lopez Varela, Sandra (UNAM)**

[78]

Discussant

[216]

Chair

**Lopez Varela, Sandra (UNAM)**

[14]

*Being an Expert Witness in Mexico's Heritage Management Process: Requirements and Issues*

In 2022, the Mexican government introduced a new heritage management process, requiring the participation of expert witnesses to determine the property of Indigenous and Afro-Mexican communities' knowledge,

traditions, intellectual property, and heritage. Mexico's experience with expert witnessing is mainly related to authenticity issues in cases dealing with the illicit traffic of antiquities or damage assessment. The required professional profile exists in other countries with a robust applied public and private heritage management sector. In those countries' heritage management criminal and civil cases, expert testimony is sometimes required to assist the court. An expert witness testifies to an opinion in reports, depositions, and trials or works as a non-testifying consulting expert to assist legal professionals behind the scenes in understanding aspects of heritage management. Unlike fact witnesses, expert witnesses are allowed to provide a professional opinion(s) on questions asked by their client, typically attorneys representing one side or the other. Thus, the needed experience is absent in Mexico's professional training. This paper discusses the ethical issues arising before an expert witness is hired by one of the involved parties and the possible problems one may encounter in working as an expert witness.

Lopez Varela, Sandra [216] see Kolb, Charles

Lorain, Alyssa [123] see Diciuccio, Laurel

**Lorenz, Samantha, Ana Margarida Moço, Rachel Holland, Rui Mataloto and Brandon Lewis [205]**

*Postmortem Rituals: Skeletal Manipulation of a Late Antiquity Burial in Portugal*

The Freixo Archaeology Project was initiated in 2015 to investigate the nature of Roman Imperial occupation in the Iberian Peninsula with an interest in the symbolic and ideological reuse of sacred space. Freixo is located within the Municipality of Redondo in southeastern Portugal, where a sixteenth-century Christian church overlays an ancient Roman basilica. Preliminary investigations have identified a number of associated burials which appear to co-occur and postdate basilica occupation. Specific interest to this paper is a double interment located at the proposed basilica entrance that contains both a northern bundle and southern extended burial. The extended burial incorporates typical Christian mortuary practices and unusual postmortem skeletal manipulation of the lumbar vertebrae. This paper will show images of the burial and associated human skeletal remains. The biocultural analysis will provide insight into the life histories of these individuals as well as contribute to the corpus of Late Antiquity mortuary rituals in the Iberian Peninsula.

Lorenz, Samantha [205] see Lewis, Brandon

**Loring, Stephen (Smithsonian Institution) [14]**

*Discussant*

Loso, Michael [15] see White, John

**Louderback, Lisbeth (Natural History Museum of Utah, University of Utah), Bruce Pavlik (Red Butte Garden, University of Utah), Alfonso del Rio (University of Wisconsin) and John Bamberg (US Potato Genebank, USDA) [140]**

*Detecting Domestication of the Four Corners Potato (Solanum jamesii Torr.)*

The process of domestication is essential for producing nutritious foods that can be grown, harvested, stored, and eaten. Recent evidence suggests that a novel potato species, known as the Four Corners Potato (*Solanum jamesii* Torr.) was manipulated by ancient people sometime during the last 12,000 years. The tubers might have been an important food and energy source because of their nutritional qualities, reliable productivity, and ability to persist in the soil. Furthermore, populations of this species now occupy atypical habitats among and within the great pueblos of the American Southwest, evidence that indigenous farming practices included this species. Therefore, a collaborative archaeological and biological approach is well-suited

to provide insight on the initial stages (use, transport, and manipulation) in the domestication process. In the broader context, detecting these stages challenges our understanding of foraging strategies and a long-established scientific paradigm regarding agricultural origins and food choices among hunter-gatherers in North America by identifying the Four Corners as a hitherto unknown center of plant domestication. Herein we present genetic, life history, and archaeological evidence pertaining to the question of domestication of a species native to the American Southwest.

Louderback, Lisbeth [130] see Wilks, Stefania

**Loughmiller-Cardinal, Jennifer (University at Albany, New York)**

[80]

*Chair*

**Loughmiller-Cardinal, Jennifer (University at Albany, New York) and James Scott Cardinal (NYSM)**

[80]

*Why Is There Math in My Archaeology? The Modern Foundations of Quantitative Archaeology Written Decades Too Soon*

Fifty years ago, what was arguably the most important paper ever written for modern work in quantitative archaeology was published in *American Antiquity*. Unfortunately for its author, and generations of archaeologists, few took notice of it at the time. With few citations, more than half of which have occurred in just the last few years, its elegance and mathematical precision went largely unappreciated—even by the growing cohorts of computational and quantitative archaeologists whose work would have greatly benefited from it. In this paper, we demonstrate that John Justeson's 1973 article "Limitations of Archaeological Inference" was not only accurate and precise in its implications, but also very much still at the forefront of archaeological thought . . . even if the field at large doesn't yet realize it.

**Lovata, Troy (University of New Mexico)**

[123]

*Wickiups as Placemaking: Contemporary Landscape Archaeology in the Mountains of Northern New Mexico*

This presentation examines how wickiups—light, compact wooden structures common across many times and places in the American Mountain West—reflect the conception and use of contemporary mountain landscapes. Landscape archaeology allows us to understand how people's actions and experiences transform the physical environment from an abstract space to a meaningful place. The material evidence of placemaking lends insight into the cultures engaged in it. Northern New Mexico mountains, and especially those in public lands, have long been contested landscapes in which time spent on the land, use of mountain resources, and generational continuity don't always match formalized ownership or governmental claims of control. Prehistoric and historic Wickiups have a recognized status in the region, but resource managers often treat contemporary examples as literally being out of place—denigrated as ahistorical, historical mimicry, vandalism, or resource destruction—on New Mexico's public lands. Study of wickiups in Northern New Mexico's public mountains and documentation of their presence in local popular culture indicate that, instead, they can be examples of a shared, community resource; as evidence of active cultural continuity; and as reflections of how people in the region react to disrupted and degraded landscapes.

**Lowe, Kelsey (University of Queensland), Enid Tom (Kaurareg Land and Sea Rangers), Michael Westaway (University of Queensland), Jaime Swift (University of Oxford) and Annie Lau (University of Queensland)**

[209]

*Unearthed Burial from Rising Sea Levels: A Collaborative Community Approach for Tackling Climate Change in the Torres Strait Islands, Australia*

The Torres Strait Islands, Australia, covers 50,000 km<sup>2</sup> and includes 300 islands, with only 17 home to

community settlements. Although regional maritime culture includes seascapes rich in cosmological and spiritual meaning, many sites that constitute cultural identity are under threat due to rising sea levels from climate change. Home to the Kaurareg people, the Murulag Island has been significantly impacted by sea-level rise. Recently, an Aboriginal burial was exposed through the highest king tide on record. The impact of sea-level change on burial and cultural sites has seen much concern and distress raised by Kaurareg elders. The lack of action by the Australian government to assist the community has resulted in the people lodging a formal complaint to the United Nations. They also sought out university archaeologists to assist them. Our paper shows how collaborative community-focused research was used to help recover their burial and repatriation. Salvage excavation, coastal modeling of shoreline loss, and a ground-penetrating radar survey to locate other burials were carried out. Our study is the first time archaeological rescue excavation has been completed in the Straits threatened by sea-level change. We hope this project will lead to an enhanced strategy for managing similar sites.

Lowe, Kelsey [121] see Kappers, Michiel

**Lowe, Lexie (National Park Service), Amy Roache-Fedchenko (Northeast Archeological Resources Program), James Nyman (Northeast Archeological Resources Program) and Margaret Wilkes (Northeast Archeological Resources Program)**

**[167]**

*VAMPing Up Stewardship in the National Parks: Preliminary Lessons from the Volunteer Archeological Monitoring Program*

From 2021–2022, the Northeast Archeological Resources Program (NARP) began partnering with five National Park units to pilot a new initiative: the design and facilitation of a region-wide volunteer archaeological site monitoring program. Working with park staff and stakeholders at the Roosevelt-Vanderbilt-Van Buren National Historic Sites, and later at Cape Cod National Seashore, local volunteers were recruited and trained to monitor archaeological site conditions, identifying and documenting potential threats and disturbances that impact these irreplaceable resources in the parks. Ultimately, these efforts support baseline inventory and Section 110 compliance, which requires federal agencies to maintain updated inventories of the archaeological resources for which they are responsible. Within the National Park Service, this is a task that requires coordination between regional archaeology programs and individual park units. In the Northeast region, there is also a present need for community-based stewardship of archaeological sites that are threatened by natural and human-caused factors. The lessons and feedback provided by this pilot launch of the Volunteer Archeological Monitoring Program (VAMP) include considerations in community volunteer engagement, resource stewardship, site data management and security, benefits to federal compliance, and how volunteer monitoring can support inclusive park programming.

Lowe, Regina [95] see Kassabaum, Megan

**Lowry, Sarah (New South Associates Inc.)**

**[120]**

*Discussant*

Lowry, Sarah [149] see Taylor, Samantha

**Lozada, Josuhé, Joel Palka (Arizona State University) and Alice Balsanelli (Universidad Nacional Autónoma de México)**

**[242]**

*Agency and Pilgrimage in a Living Landscape: Contemporary Lacandon Maya Visits to Ancient Ruins*

In this presentation, we analyze Lacandon Maya communication with nonhuman forces through pilgrimages to ritual landscapes, particularly ancient Maya ruins in the lowlands of Chiapas, Mexico, and Petén, Guatemala. Through archaeological and ethnographic evidence we examine these spaces where Lacandon Maya have

undertaken religious pilgrimages. Ancient Maya sites present material evidence, including graffiti, rock art, and ceramic incense burners that allow us to examine Lacandon pilgrimage destinations through GIS. Hence, we can reconstruct Lacandon pilgrimage behavior through their travel routes and directions within and between ancient Maya ruins. Through this analysis, we can understand how contemporary Lacandon Maya maintain ties with spiritual forces attached to archaeological sites in the region, such as caves with burials, cliffs with rock art, and ancient Maya monumental architecture. Lacandon have configured these sites as a living landscape unseeable to human eyes, but necessary for their social life and community prosperity.

**Lozada Mendieta, Natalia (Universidad de Los Andes)**

[59]

*Reconstructing Technological Traditions and Interaction in the Precolonial Middle Orinoco: Ceramics in Mono- and Multiethnic Communities in the Amazon Basin (AD 1000–1500)*

Ceramic analyzes in precolonial archaeological sites in the Orinoco followed cultural history and ecological and evolutionary frameworks. However, the co-occurrence of different ceramic styles within common periods in multicomponent sites was not fully addressed, sometimes assuming it was the result of trade or from functional specialization. This co-occurrence phenomenon was common on the Picure (cal AD 310–1480) and the Rabo de Cochino (cal 100 BC–AD 1440) archaeological sites, situated on the Átures Rapids (Middle Orinoco), historically characterized as a center of commerce in the contact period. To identify whether the ceramic styles found corresponded to trading activities or belonged to the same community, various analyzes were conducted as part of a doctoral research at UCL. Using macro- and microscopic analyses (macro-trace, petrography, portable X-ray fluorescence), we reconstructed the *chaîne opératoires* of the different ceramic materials recovered in the later period (AD 1000–1500) on both sites. We were able to distinguish between local and exogenous ceramics based on raw materials and manufacturing techniques, which confirm trading activity prior to the Europeans arrival to the area. Research also suggests multi- and mono-ethnic communities producing and using hybrid or plural tableware, addressing precolonial pottery production and circulation.

**Lozano, Jacob (Texas State University)**

[133]

*Stories in Stone: Scribal Traditions and Practices of the Dolores-Poptun Corridor*

Varying facets of ancient Maya visual expression have long documented cultural elements of identity, political relationships, and social organization. These components manifest in a spectrum of archaeological material and cultural remains. Within the abundant regions and polities, evidence suggests the existence of local artistic and scribal traditions. The goal of this paper is to examine the epigraphic and iconographic records of several sites throughout the region of Dolores, located in Petén, Guatemala, with the aim of identifying examples of regional artistic and scribal styles. In addition, this paper also seeks to acknowledge indications of external political and social pressures, concealed within the monumental texts and iconography. In doing so, this paper will add clarity and supplemental knowledge to the histories of minor Maya kingdoms, enriching our insight into the roles of these polities within the ancient Maya sociopolitical structure.

**Lozano, Stephanie (University of California, Riverside)**

[206]

*Ancient Mesoamerican Rain Cloud Iconography and Early Rain Entities*

Cloud iconography has been present on Mesoamerican material culture since the Formative period and often appears with iconography that is associated with water rituals and rain entities. This paper will present new perspectives on the relationships between ancient Mesoamerican rain deities through a study of rain cloud iconography. I trace the appearance of rain cloud imagery from the Formative period to the Classic period focusing on early Mesoamerican rain gods. Previous scholars (Taube 2009) have noted that clouds emerge from the heads of Preclassic Maya rain gods. In addition, I suggest that cloud imagery can also be seen emerging from different parts of the face of early Mesoamerican rain deities. For example, I propose that early Maya and Zapotec rain entities have rain clouds emerging from their eyebrows. Moreover, I posit that

the Teotihuacan Tlaloc's bigotera, a mustache like element, was a rain cloud scroll influence from Preclassic Maya rain gods. I also point out the striking similarities of cloud iconography at Teotihuacan with the Teotihuacan Tlaloc's bigotera. Finally, I propose that the Late Postclassic Mexica Tlaloc is shown wearing the Nahuatl cloud glyph, mixtli, as the bigotera.

**Lu, Jou-chun (National Taiwan University)**

[161]

*Interpreting the Relationship between Political Structure and Different Consuming Strategies of Imported Chinese Ceramics through Comparative Analysis: A Case Study of Eighth–Eleventh-Century Japan*

In the eighth–eleventh centuries CE, Chinese ceramics were imported to Japan and showed limited distribution in specific sites. Historical documents, along with their geographic distribution and both fine and coarse ceramic assemblages, suggest these sites shared political connections. Past studies on trade ceramics in China have typically directly applied a political explanation. However, I argue a dynamic social structure in eighth- to eleventh-century Japan should also be considered. This paper considers the agency of social groups living in different settlements, analyzing the style, function, frequency, and distribution of trade ceramics to better understand consumption strategies at these different sites. Furthermore, the question of how consumer preferences interacted with the existing political structure can be discussed through the comparative approach and long-term observation.

Luan, Fengshi [216] see Underhill, Anne

**Lubinski, Patrick (Central Washington University), Karisa Terry (Central Washington University), James Feathers (University of Washington), Karl Lillquist (Central Washington University) and Patrick McCutcheon (Central Washington University)**

[70]

*Is the Wenas Creek Mammoth Site Anthropogenic?*

The Wenas Creek Mammoth Site was excavated 2005–2010 near Selah, Washington, USA, yielding bones of mammoth and bison dating ~17 ka, and two lithics resembling chipped stone debitage. Prior publications have reported on some aspects of the project and this poster summarizes those as well as subsequent analyses. The bones were disarticulated and scattered within a stratum of gravelly silt loam colluvium on a hillside. The mammoth remains compose 68 elements, primarily vertebrae, limb elements and ribs, while the bison remains compose 21 elements, including lumbar vertebrae, sacrum, and left hindlimb elements. Neither mammoth nor bison remains show any evidence of human modification although some mammoth bones exhibit green fracture. The possible debitage includes one resembling a blade fragment made of lithic material visually distinctive from the site matrix and dating either ~17 ka (75 associated single grain IRSL dates) or ~5 ka (19 associated single grain IRSL dates). As with earlier reports, the site continues to provide an uncertain association of 17 ka paleontological materials and human activity.

Lucas, Gina [181] see Holguin, Brian

**Lucero, Lisa (University of Illinois, Urbana-Champaign)**

[243]

*Discussant*

**Lucero, Lisa (University of Illinois, Urbana-Champaign)**

[60]

*African Archaeology and the Ancestral Maya World*

Lidar mapping has revealed extensive ancestral settlement patterns signifying a low-density urban system. Maya archaeologists are tasked with interpreting how the ancestral Maya interacted and kept this system working for over 1,000 years (ca. 100 BCE–900 CE) in the southern Maya lowlands of Central America. It

was a complex system, one where scholars cannot rely on the written record to explain its inner workings since it only focused on royal life—and not on economic issues, political structures, tribute systems, agricultural practices, seasonal schedules, means of transportation, and so on. Maya archaeologists often look to other case studies globally, including several in Africa, particularly those in tropical areas above and below the equator, such as Djenné-Djenno in Mali (400 BCE–1000 CE) and its surrounding self-organizing and heterarchical communities, and the Aksumite Kingdom (ca. 150 BCE–850 CE) in the Ethiopian Highlands with its diverse capital city, Aksum, as well as its extensive trade network. I am particularly interested in how Africanist scholarship addresses the seasonal pulses of interaction between urban cores and hinterland peoples and resources, as well as the different trajectories of political histories versus durable agricultural and social practices.

**Luchsinger, Heidi (SWCA Environmental Consultants)**

[123]

*Geoarchaeological Coring: Determining Where Intact Buried Archaeological Sites Should Be and Shouldn't Be*

For decades, archaeologists have used coring for subsurface testing and paleolandscape reconstruction, but only sporadically. Non-invasive and efficient, core extraction produces intact stratigraphic columns collected in clear plastic tubes that can be brought back to the lab for analysis. Unlike shovel testing and backhoe trenching, coring has no depth limit. This is particularly valuable for testing deposits deeper than 5 feet such as in river valleys, wetlands, and coastal zones. Coring's efficiency equals or surpasses that of traditional methods and coring rigs are widely available. However, the integration of coring into the initial stages archaeological projects is far from mainstream despite its efficiency and affordability. Recent geoarchaeological coring in deep deposits throughout the mid-Atlantic and Midwest have demonstrated the effectiveness of this method for determining the relative and absolute age of deposits, assessing potential for containing intact archaeological sites, and defining the location of buried surfaces that were potentially occupied. The result is a more efficient method for demonstrating where buried and preserved archaeological sites should be, and where they shouldn't be.

Luley, Benjamin [211] see Farah, Kirby

Luncz, Lydia [69] see Borsodi, Sara

Lundy, Debbie [8] see Haas, Randy

Lupo, Karen [203] see Edwards, Nicolette

**Lupu, Jennifer (Northwestern University)**

[169]

*From "Gray Literature" to "Big Data": Synthesizing Archaeological Data in Washington, DC*

The vast array of technical reports produced through cultural resources management (CRM) archaeology are sometimes referred to as "gray literature," due to their limited reuse after the project is completed. However, archaeologists working in CRM excavate the majority of sites in the United States, and these reports represent the collected findings of decades of archaeological excavation; they provide a valuable but complex dataset for addressing numerous research questions. As archaeologists continue to call for synthetic research and collections-based work, the under-examined data from the "gray literature" provides an opportunity for a "big data" approach to synthesizing archaeological findings. In this paper, I discuss methodological possibilities and obstacles for tackling this dataset. I use ArcGIS and R to experiment with approaches to data visualization and analysis. As a case study, I examine data from technical reports relating

to 40 household refuse deposits, excavated within the city of Washington, DC. The dataset draws together artifacts discarded between 1850 and 1930, collected during archaeological projects that took place between 1980 and today. I discuss how I collected and “cleaned” the data from the reports, and present preliminary approaches to visualization and analysis.

Lurie, Makena [44] see Graesch, Anthony

**Luurtsema, Anna (University of Michigan), Kara Larson (University of Michigan), Alicia Ventresca Miller (University of Michigan) and Henry Wright (University of Michigan)**  
[76]

*An Isotopic and Proteomic Investigation of Uruk Period Faunal Remains from Tepe Farukhabad, Iran*

Located in southwest Iran and occupied since the fourth millennium BCE, Tepe Farukhabad is a prime example of an Early Uruk town. Numerous faunal remains were recovered from excavations in the 1960s, including those from wild animals, such as gazelle and horses, as well as from domesticated sheep, goats, and cows. Interestingly, between the Early/Middle Uruk and Late Uruk periods, there was a marked decrease in the density of wild, hunted animal bones found in comparison to domesticated animal bones; this finding strongly correlates with increased sedentism and reliance on domesticates over hunted animals for subsistence. To offer insight into this transition, this poster will utilize isotopic and proteomic data to contrast the mobility of the fauna from the Early/Middle and Late Uruk periods. Variation in herd management between the two periods will reveal the extent to which the decreased dependence on hunting impacted the stability of the diets of the inhabitants of Tepe Farukhabad. Altogether, this poster will build on our understanding of the introduction and reliance on domesticated animals as a food source in Tepe Farukhabad, a town in the midst of the transition from hunting to herding.

**Luzzadder-Beach, Sheryl (University of Texas, Austin)**  
[236]

*Discussant*

**Luzzadder-Beach, Sheryl (University of Texas, Austin), Timothy Beach (University of Texas, Austin), Nicholas Dunning (University of Cincinnati), Duncan Cook (Australian Catholic University) and Samantha Krause (Texas State University)**  
[17]

*Soil Carbon Persistence and Influence in the Early Anthropocene of the Maya Lowlands*

Coupled studies of Maya Lowlands soils and geoarchaeological exploration provide insight into neotropical soil and atmospheric carbon cycle dynamics in space and time, and soil carbon's role in defining the Early Anthropocene. This paper tests the hypothesis that soil carbon persistence differs in time, space, and between geomorphic and archaeological settings. We use dated soil carbon isotopic results from multiple geoarchaeological investigations we have conducted in the Maya lowlands of Central America, to compare rates of soil carbon storage, flux, and persistence in this neotropical region. These results are relevant for quantifying variables to improve models of human inputs to climate change during and after the Early Anthropocene, based on landscape developments for agriculture such as terracing, and ditched and raised fields. We expect that rates of change and recovery will vary based on geomorphic and paleoecological settings, and on post disturbance recovery. These rates should be taken into account in modeling atmospheric CO<sub>2</sub> inputs attributed to ancient human land disturbance, use, conservation, and abandonment, and can give insight into modeling modern and future human impacts on the atmosphere.

Luzzadder-Beach, Sheryl [236] see Beach, Timothy

Luzzadder-Beach, Sheryl [54] see Character, Leila

Luzzadder-Beach, Sheryl [236] see Clark, Morgan

Luzzadder-Beach, Sheryl [17] see Cook, Duncan

Luzzadder-Beach, Sheryl [54] see Doyle, Colin  
Luzzadder-Beach, Sheryl [54] see Flood, Jonathan  
Luzzadder-Beach, Sheryl [54] see Krause, Samantha  
Luzzadder-Beach, Sheryl [236] see Landa, Yesenia  
Luzzadder-Beach, Sheryl [54] see Smith, Byron

**Lycett, Mark (University of Pennsylvania)**

**[215]**

*Discussant*

Lycett, Stephen [219] see Eren, Metin

**Lynch, Elizabeth (University of Wyoming), Mary Lou Larson (University of Wyoming (Emerita)) and Marcel Kornfeld (University of Wyoming)**

**[229]**

*Digitizing the Collections from the Hell Gap National Historic Landmark Excavations 1960 to Present*

In 2019, we began a three-year project to digitize the collections from the Hell Gap National Historic Landmark. The site is well-known for its archaeological integrity and preservation of some of the earliest human activities in the Plains and the Rocky Mountains. The goal of the Hell Gap Archaeological Records Digital Archive Project (HGARDA) is to preserve the slides, negatives, unit notes, artifacts, and other voluminous records generated since excavations began in 1961. We have also begun an oral history project that documents field school participant experiences from the 1960s. This paper presents the current status of the HGARDA project. It shows how the public will be able to access digital objects and 3D artifact models through the UW Digital Collections.

**Lynch, Paige**

**[251]**

*Sociopolitical Change and Its Effect on the Biology of a Medieval Polish Population through Isotopic Analysis*

The Jagiellonian period (1386–1572) in Poland underwent a shift toward a feudal sociopolitical and economic structure leading to an increase in social stratification and unequal distribution of power, opportunity, and resources (e.g., food). The medieval site of Gać (fourteenth–sixteenth centuries) provides a unique opportunity to gain insight into the lives of the people in Poland during a time with little historic or archaeological data for non-elites. The proximity of Gać to nearby centers, and the potential for involvement in complex economic exchange networks, make the site an ideal place to examine the complex interplay between biology and culture. Through a biocultural lens, this project examines how a non-elite medieval Polish population biologically responded during periods of significant sociopolitical change using molecular and skeletal analysis of human skeletal remains, correlated with historical documentation of sociopolitical events. Preliminary data investigates how serfdom and Christian fasting of terrestrial animals for marine/freshwater source consumption impacted diet. This study presents analyses of stable isotopes of strontium and oxygen to distinguish between local and nonlocal individuals and carbon and nitrogen to assess diet on directly dated skeletons. It is hypothesized that diet will differ between migrants and locals and reflect fish consumption.

Lynch, Paige [251] see Wysocka, Joanna

Lynn, Christopher [226] see Smetana, Michael

Lynn, Thalia [128] see Meier, Jacqueline

**Lyons, Natasha (Ursus Heritage Consulting), Chelsey Armstrong (Simon Fraser University), Tanja Hoffmann (University of York), Roma Leon (Katzie First Nation) and Michael Blake (University of British Columbia)**

[20]

*Investigating the Principles of “Good Farming”: A Comparison of Traditional Agrarianism and Indigenous Land Use and Cultivation*

In his long career as an agrarian writer, Wendell Berry has documented and endorsed the precepts of “good farming” as those that require care, knowledge, self-mastery, good sense, cultural memory, and fundamental decency. This carefully crafted set of practices stands in stark opposition to the aggressive colonial economy that drives industrial farming across much of America and the world and ultimately impoverishes the land and resource base as well as the communities who tend them. Berry’s conception of agrarianism as a highly skilled, iterative, and dynamic set of processes that bind people to landscapes in enduring relationships has significant parallels with the principles accorded by Indigenous First Peoples to long-standing territories in the Pacific Northwest. In this paper, we describe Indigenous management practices developed to create and sustain a variety of anthropogenic habitats and documented over millennia in Katzie, Sts’ailes, and Tsymshen territories, investigate the common strategies and ideologies shared with traditional agrarianism, and consider the opportunities this knowledge offers to improve land-use models in the midst of a world in climate crisis.

**Lyons, Patrick (Arizona State Museum)**

[48]

*Chair*

**Maca, Allan (Universidad Nacional Autonoma de Honduras)**

[154]

*Mushroom Stones of Mesoamerica, a Statistical Analysis*

This paper presents the results of a statistical analysis of a large sample of the “mushroom” stones of Mesoamerica, with particular emphasis on the sample linked to provenances in Guatemala. The production of “mushroom”-shaped stones in ancient Mesoamerica spanned nearly 1,000 years and numerous geographic and cultural regions. While several hundred of these sculptures exist, relatively few have been found in situ and, partly for this reason, their function remains a mystery and their chronology is unclear. The data presented here shed new light on these gaps and support the use in archaeology of some often overlooked statistical tools.

**Maca, Allan (Universidad Nacional Autonoma de Honduras)**

[204]

*Discussant*

**MacDonald, Brandi (Archaeometry Lab at MURR), Elizabeth Velliky (Centre for Early Sapiens Behavior [SapienCE]), Jorg Linstatder (Deutsches Archäologisches Institut [DAI]), Lisa Ehlers (Deutsches Archäologisches Institut [DAI]) and Gregor Donatus Bader (Senckenberg Centre for Human Evolution and Palaeoenvironment)**

[2]

*Geochemical Insights on Earth Mineral Pigment Provisioning and Use in Stone Age Eswatini*

We present results of a multi-method, regional-scale iron and manganese-oxide provenance study centered on five Middle and Late Stone Age sites and raw material sources in Eswatini. Earth mineral pigment artifacts are abundant at MSA and LSA sites and the variation observed in their typologies shows changes over time in mineral selection. Eswatini is home to several iron and manganese ore deposits that produce high quality, vibrant red, purple, and black pigments. Those sources, such as Ngwenya (Lion Cavern), were sites of mineral

collection at least 40,000 kya, if not earlier. We synthesize data from trace element analysis (NAA, LA-ICP-MS) and mineral and structural characterization (XRD, SEM-EDS), applying the methods to artifacts and geologic materials, as well as new insights into rock art. Our results provide insight into the potential for mineral provisioning as a proxy for changes in mobility, land-use patterns, and artistic and mineral preferences during the MSA and LSA.

MacDonald, Brandi [8] see Augustine, Jonah  
 MacDonald, Brandi [28] see Chanteraud, Claire  
 MacDonald, Brandi [139] see Knobloch, Patricia  
 MacDonald, Brandi [10] see Navas-Méndez, Ana  
 MacDonald, Brandi [166] see Welch, John

**Macdonald, Danielle (University of Tulsa)**

**[214]**

*Chair*

**Macdonald, Danielle (University of Tulsa), Lisa Maher (University of California, Berkeley), Theresa Barket (California State University, Los Angeles), Naomi Martisius (University of Tulsa) and Ahmad Thaher (Independent Researcher)**

**[171]**

*Assessing Change over Time at Kharaneh IV through the Chaîne Opératoire*

The multicomponent Epipaleolithic site of Kharaneh IV, located in the Azraq Basin of eastern Jordan, documents over 1,000 years of occupation by hunter-gatherer groups during the end of the Last Glacial Maximum. Multiple lines of geomorphological, faunal, and archaeobotanical evidence indicate that the environs around the site were well-watered, lushly vegetated, and rich in a wide variety of animal species, clearly drawing human populations to the area. Over time, multiple Early and Middle Epipaleolithic groups congregated in this verdant landscape, perhaps coming as far as the Mediterranean and Red Seas. In this paper, we explore changes in lithic technology at the site from the Early to the Middle Epipaleolithic through the lens of one deep sounding. These changes are examined through the conceptual framework of the *chaîne opératoire*, where the entire production, use, and discard sequence is considered integral to understanding how stone tools were developed and maintained at such a unique aggregation site. Changes in the *chaîne opératoire* from the Early to the Middle Epipaleolithic illuminate the different strategies employed by the inhabitants of Kharaneh IV, and when paired with other aspects of the archaeological record, highlight changes in these communities and their adaptations to a dynamic landscape.

Macdonald, Danielle [171] see Barket, Theresa  
 Macdonald, Danielle [171] see Maher, Lisa  
 Macdonald, Danielle [214] see Martisius, Naomi  
 Macdonald, Danielle [214] see Stemp, W. James

**MacDonald, Douglas (University of Montana)**

**[94]**

*Is Yellowstone a Wilderness? The Role of Archaeology in Challenging Contemporary Views of Wild Areas*

Archaeologists are in a unique position to challenge the contemporary view of wilderness as defined by the United States in the 1964 Wilderness Act. Following the postmodern critique of William Cronon, Mark David Spence's 1999 book *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks*, examined the removal of Indigenous people prior to the establishment of places like Yellowstone and Yosemite National Parks. Can the parks really be considered wilderness, as defined as places lacking historical human occupation and unable to support human life? The irony of calling a place like Yellowstone a "wilderness" is obvious, considering that its Native inhabitants were removed in order to make it "wild." Can such places even be considered "natural" spaces without the original human inhabitants? Archaeological

research in Yellowstone establishes the presence of Native Americans in all portions of the park for at least 11,000 years, supporting the fact that the park's landscapes amply support human hunter-gatherers and are not, in fact, inhospitable landscapes devoid of human life.

Macdonald, Rebecca [29] see Scott, Michael

**MacFarland, Kathryn (Arizona State Museum, University of Arizona)**

[65]

*Chair*

[231]

*Discussant*

**MacFarland, Kathryn (Arizona State Museum, University of Arizona) and Katherine Dungan (Arizona State Museum)**

[65]

*This Is the Way: Moving toward Best Practices in Collection and Data Submission to Archaeological Repositories*

Archaeological repositories curate artifacts and associated documentation for state, tribal, and federal agencies. In carrying out their legally mandated duties, each repository faces unique challenges, but common to all is the well-documented, multifaceted national curation crisis. The Arizona State Museum (ASM) is no exception, with personnel working to preserve the physical integrity and information potential of collections for multiple stakeholders with limited space and financial resources. National and local focus on the crisis has illuminated various avenues for improvement in archaeological and museological practice, but there is still work to be done to characterize the problems and identify solutions. This paper contributes to the discussion, focusing on ways that collections come to designated repositories, such as ASM, from academic and cultural resources management excavations and the ways each type of project contributes to the crisis in Arizona. Evaluating the scope, incoming condition, effort required to prepare each type of collection for curation, and resources allocated for maintenance of each offers a chance to reflect on internal practice from the field to the repository, and keeping stakeholders needs in mind, identify cost-effective ways in which collection depositors can help prepare archaeological resources for collections management and future collaborative synthetic research needs.

MacFarland, Kathryn [229] see Dungan, Katherine

**Maciej, Arkadiusz and Marcin Blaszczyk (Academy of Fine Arts in Cracov)**

[34]

*Architecture and Conservation Works at Chajul*

One of the major objectives of the Chajul Murals Conservation Project (COMUCH) was the consolidation and conservation of murals in several houses located at the modern town of Chajul inhabited by the Ixil Maya and located in the department of El Quiché, in western Guatemala. During our research carried out between 2015 and 2022, conservation and consolidation works of three houses with murals was conducted. Moreover, we were able to carry out detailed documentation of several more houses with murals. Our works apart from conservation included photogrammetry and 3D scanning, which show that at Chajul existed a unique pictorial tradition related to the socio-religious activities of local *cofradías* (religious brotherhoods).

**Mack, Cheryl (Olallie Research)**

[180]

*Evidence for Winter Bear Hunting from Lava Tube Caves in Southwest Washington*

The southwestern flanks of Mt. Adams, Washington, contain numerous lava tube caves. These lava tubes can be quite complex, containing narrow passages on multiple levels. In the course of exploring these lava tubes,

modern cavers have inadvertently discovered a total of 16 projectile points and a flake tool, within 12 different lava tubes. These artifacts were all found within the “dark zone” and taken together these discoveries reflect a pattern of precontact cave use. A variety of analyses have been performed in an attempt to determine the function and age of these artifacts, including technological/use-wear analysis, blood protein residue analysis, obsidian sourcing and obsidian hydration. Positive blood protein residue results, coupled with ethnographic accounts of winter bear hunting, suggest that these artifacts may be related to the hunting of hibernating bears in their dens in winter.

**Mack, Joanne (University of Notre Dame), John Fagan (Archaeological Investigations Northwest Inc.), Mark Swisher (Volunteer Researcher, Oregon State Museum) and Cam Walker (Archaeological Investigations Northwest Inc.)**

[179]

*Residue Analysis by Crossover Immunoelectrophoresis (CIEP) on Siskiyou Utility Ware, a Pilot Study from Southern Oregon*

Ceramic vessels have rarely been recovered archaeologically in western Oregon or northern California. This may be the first study of its kind, where Crossover Immunoelectrophoresis (CIEP) was used to identify protein residues on Pacific Coast ceramics. On a sample of 10 Siskiyou Utility Ware sherds, three sherds contained protein residue from subfamily Salmonidae (*Oncorhynchus*); though tested for, no mammal protein residues were found. All 10 sherds had been recovered from archaeological excavations undertaken along the Upper Klamath and Upper Rogue Rivers in southwestern Oregon. The results speak to the importance of salmon species to precontact peoples, and suggest more usage of CIEP technique can be useful in understanding traditional subsistence strategies.

Mack, Liza [29] see LaZar, Miranda

Mackey, Carol [164] see Boswell, Alicia

**Mackie, Madeline (Weber State University), Briana Doering (University of Wyoming), Fox Nelson (University of Wyoming), Molly Herron (University of Wyoming) and Carlton Shield Chief Gover (Indiana University Bloomington)**

[29]

*New Context from an Old Site: Collections Research on the Colby Mammoth Clovis Site*

Since the first discovery of projectile points associated with mammoth remains, the iconic re-creation of Clovis life has been a group of hunters stalking this multi-ton animal. However, despite nearly 100 years of research, questions remain about traditions associated with Pleistocene megafauna hunting including its frequency and importance. In the 1970s excavations at the Colby Mammoth site (48WA322) recovered the remains of at least seven mammoths along with diagnostic Clovis materials in two piles interpreted to be meat caches. Since this time the site has consistently been featured as a widely accepted mammoth butchery site but has been the focus of little additional research apart from radiocarbon dates. More than 35 years later we return to the original collection to address lingering questions about the site's use and chronology. Using enamel stable isotope analysis (O, C, and Sr) and radiocarbon ages we evaluate the relationship between the Colby mammoths to reconstruct herd dynamics and mobility and test if the mammoth remains are the result of a single hunt or the persistent use of the site over multiple seasons. This legacy collection research provides insights into both mammoth ecology and Pleistocene hunting traditions.

Mackie, Madeline [170] see Kelly, Robert

Mackie, Madeline [130] see McDonough, Katelyn

Mackie, Madeline [44] see Nelson, Fox

**Mackie, Quentin (University of Victoria)****[92]***Subsistence Practice as Remote Sensing on the Northwest Coast*

The underwater landscape of the Northwest Coast is largely concealed from direct perception by human senses. Except in a literally shallow and transient way, humans cannot visit this hidden environment. The intertidal, surficial and nearshore resources were, of course, known in superb detail. Yet, Indigenous communities also held accurate and granular mental models of the deeper seafloor and its affordances, such as halibut banks, lingcod reefs, and dentalia grounds. I argue that fine-grained and specific knowledge of the sea floor and its affordances was gained by feeling the bottom with fishing gear or other instrumentation, necessarily practiced from watercraft. In this view, bottom fishing is simultaneously an act of subsistence and an act of perception. Water depth, the regime of currents down the water column, benthic biota, and the benthic substrate can all be determined by visual and haptic effects through fishing gear, and constitute a bycatch of submarine landscape knowledge. Drawing on theories of the environment and the maritime world developed by Tim Ingold, Jakob von Uexküll, and Hein Bjerck, I will argue that canoe-borne fishing practices embedded a practice of “remote sensing,” which itself enabled accurate Indigenous cartographies of the deep.

**MacLellan, Jessica (Wake Forest University)****[131]***Is a Woman's Place in the Household? Gender, Prestige, and Feminized Archaeology*

Archaeologists consider the household the smallest unit of economic and social production and acknowledge household activities have bottom-up effects on society. However, studies of households are not as headline-grabbing as “lost” cities and royal tombs and may be undervalued in terms of impact factor and funding. Archaeologies of gender and childhood, carried out mainly by women, have been confined to household contexts, as studies of public activities have focused on men. Feminist and gender-focused archaeology was how women began to be taken seriously in the realm of archaeological theory, but as Margaret Conkey points out, this archaeology is often isolated at the back of a volume rather than integrated into broader analyses of societies. As intersectional approaches to identity and inequality have become more popular, has the influence and popularity of household archaeology increased? Following Scott Hutson and others, I examine participation in and citation of household archaeology in archaeological journals over time. As a cisgender woman, I also reflect on why I was drawn to household archaeology and why I did not focus on gender or employ a feminist lens in my dissertation.

**Macleod, Ruairidh (University of Cambridge), Rick Schulting (University of Oxford), Angela Lieveise (University of Saskatchewan), Andrzej Weber (University of Alberta) and Eske Willerslev (University of Copenhagen)****[53]***Ancient Genomics of Hunter-Gatherers at Lake Baikal: Shamanka II Case Study*

This talk will discuss the utility of ancient genomic data to gain insight into prehistoric hunter-gatherer lifeways and social organization at Lake Baikal. Specifically, we will focus on familial relationships in a putative massacre instance from the Early Bronze Age at the cemetery site of Shamanka II, in conjunction with the presentation of Lieveise and Schulting in the same session that details the bioarchaeological analysis of this assemblage. Maximum likelihood inference of the topology of extended familial relationships through ancient genomics can shed insight into community structure and practices in prehistoric hunter-gatherer bands, and in this specific case, provide insight into the concurrency of deaths and burials in the Shamanka II group. The large-scale Stone Age cemeteries at Lake Baikal also provide an ideal context to study changes in social organization and heritable impacts of hunter-gatherer social inequality.

Macleod, Ruairidh [53] see Wang, Yucheng

**MacMillan, Alison (Trent University) and Eugene Morin (Trent University)****[118]***Identifying Signatures of Bone Grease Rendering in Archaeological Contexts*

Toward the end of the Paleolithic, foragers have been inferred to render small amounts of fat from cancellous bone in a process known as bone grease rendering (BGR). As the goal is to extract additional energy from each animal, the technology possibly emerged in response to seasonal resource stress. BGR is presently associated with the Holocene; more secure identification in Paleolithic contexts could have significant implications for understanding human evolutionary processes and subsistence behavior of Neanderthals and early modern humans. Standard identification methods are problematic as criteria such as the presence of highly fragmented bone and fire-cracked rocks are not individually diagnostic and do not always co-occur, and other anthropogenic/postdepositional activities can produce similar signatures. This paper is an experimental exploration of variation in the BGR signature from an archaeozoological perspective, focusing on new criteria associated with cancellous bone fragments. The present research quantifies variation in fragment distribution and morphologies, and frequencies of crushing/tearing marks and micro-inclusions for three hammerstone types using white-tailed deer tibiae and humeri. Results suggest that micro-inclusions are useful signatures of BGR. A discussion of hammerstone micro-properties and a newly identified micro-bruising signature is followed by new recommendations for the archaeological identification of BGR.

MacMillan, Vincent [28] see Palonka, Radoslaw

**Macrae, Scott (University of Central Florida)****[109]***Chair***Macrae, Scott (University of Central Florida), Kong Cheong (American University), Gyles Iannone (Trent University) and Pyiet Phyo Kyaw (Mandalay University)****[109]***Settlement Archaeology at the “Classical” Burmese (Bama) Capital of Bagan, Myanmar (Eleventh to Fourteenth Centuries CE): Theory, Method, Application, and Preliminary Outcomes*

In 2017, at the invitation of UNESCO-Myanmar, IRAW@Bagan initiated a settlement archaeology project at the “Classical” Burmese (Bama) capital of Bagan, Myanmar (eleventh to fourteenth centuries CE). This research is focused on the peri-urban (mixed urban-rural) settlement zone immediately surrounding the walled and moated royal city. Its aims are to generate an integrated socioecological history for residential patterning, agricultural practices, and water management across a range of significant ecological, climatic, economic, sociopolitical, and religious changes. This presentation outlines the overarching motivations and goals for the research program, discusses the theoretical and methodological basis for the study, details specific field applications, and summarizes some of the preliminary findings.

Madeline, Ronald [49] see O’Mansky, Matt

**Madsen, Christian (Greenland National Museum & Archives), Michael Nielsen (Greenland National Museum & Archives), Aka Simonsen (Kujataa UNESCO World Heritage Office) and Arnaq Bjerge (Kujataa UNESCO World Heritage Office)****[173]***No Empty Landscapes: Livelihood, Agency, and Transformation in Early Inuit South Greenland*

Kujataa—South Greenland—constitutes a verdant environmental niche and was one of the most populous regions in Arctic Greenland, occupied by the Norse between ca. AD 985 and 1450 and Inuit in the following centuries until today. Whereas Norse society has been much studied, Inuit archaeology and history in Kujataa has been somewhat overlooked. This paper reports on two ongoing projects that investigate the development and character of early Inuit society in the period ca. AD 1450–1900 across three different fjords. When and how rapidly was the region settled by the Inuit? How did the Inuit use resources in the

landscape and did this change over time? How many people were there, and what were the impacts of cultural encounters? Preliminary findings suggest that, while Kujataa shared many social-ecological similarities with West Greenland, Inuit society in Kujataa did develop certain regional traits but also was in a constant state of change and development. Agency and social impacts likely played a bigger transformative role in these developments than climate change or environmental factors.

Madsen, Christian Koch [173] see Nielsen, Michael

**Maezumi, S. Yoshi (Max Planck Institute for Geoanthropology), Sarah Elliott (University of Bournemouth), Mark Robinson (University of Exeter) and Jose Iriarte (University of Exeter) [20]**

*Indigenous Land Use and Cultural Burning in the Amazon Rainforest Ecotone*

The southwestern Amazon Rainforest Ecotone is the transitional landscape between the tropical forest and seasonally flooded savannahs of the Bolivian Llanos de Moxos. These heterogeneous landscapes harbor high levels of biodiversity and some of the earliest records of human occupation and plant domestication in Amazonia. While persistent Indigenous legacies have been demonstrated elsewhere in the Amazon, it is unclear how past human–environment interactions may have shaped agroecosystems in the ARE. Here, we examine 6,000 years of archaeological and paleoecological data from Laguna Versalles (LV) and Laguna Ignacito (LI), Bolivia. Both LV and LI were dominated by stable rainforest vegetation throughout the Holocene. Maize cultivation and cultural burning are present after ca.5700 cal yr BP. Polyculture cultivation of maize, manioc, and Ieren after ca. 3400 cal yr BP predates the formation of Amazonian Dark/Brown Earth (ADE/ABE) soils (approx. 2400 cal yr BP). ADE/ABE formation is associated with agroforestry indicated by increased edible palms, including *Mauritia flexuosa* and *Attalea* sp., and record levels of burning, suggesting that fire played an important role in agroforestry practices. The frequent use of fire altered ADE/ABD forest composition and structure by controlling ignitions, decreasing fuel loads, and increasing the abundance of plants preferred by humans.

Maezumi, Yoshi [121] see Kappers, Michiel

Maggard, Greg [19] see Stackelbeck, Kary

Maggi, Roberto [87] see Gravel-Miguel, Claudine

Maggi, Roberto [87] see Rellini, Ivano

**Mahan, Chase (University of Wyoming) [88]**

*Paleoindian Use of Eocene Chert from the Wyoming Basin*

The first people who occupied the western hemisphere are characterized as being highly mobile and for having a propensity for using high quality cherts. Many of these high-quality lithic sources have been described and documented, while Eocene cherts of the Wyoming Basin have yet to have the same attention nor are they recognized as being a favorable Paleoindian toolstone. This project addresses the need to characterize this rich geologic environment and discusses how Paleoindians interacted with this landscape. Examining Eocene chert toolstone from the Wyoming Basin and its presence in Paleoindian archaeological sites as a proxy for mobility, I assess the viability of high mobility models for settlement at the end of the Late Pleistocene. I compare Eocene chert procurement from Paleoindian sites that could reasonably contain Eocene chert, as well as a case study from the Scoggin Chain Lake site (48SW13622), to evaluate regional models of lithic procurement for the Late Pleistocene and subsequent Holocene within the Wyoming Basin.

Mahan, Chase [130] see Koenig, Charles

Maharesy Chrisostome, Zafy [133] see Buffa, Danielle

**Maher, Lisa (University of California, Berkeley), Danielle Macdonald (University of Tulsa), Theresa Barket (California State University, Los Angeles) and Ahmad Thaher [171]**

*Approaches to Lithic Technology: How Archaeological Practice Influences Interpretation of Past Lifeways through the Lens of Kharaneh IV*

Cultural affiliation and change in the Epipaleolithic (EP) period of Southwest Asia has historically been marked through microlithic stone tool technologies, where stone tool manufacturing is focused on the production of a large number of small bladelets then retouched into various microlith types. While researchers recognize the contributions of other aspects of the material culture record in defining the complexities of Epipaleolithic lifeways, the analysis of microlithic-based chipped stone technologies remains central to understanding the nature of various economies, technologies, and social interactions of EP hunter-gatherer groups. Acknowledging the relevance of, and long-standing reliance on, the analysis of chipped stone assemblages, in this paper we address the current state of research on Epipaleolithic chipped stone analysis through an assessment of current analytical approaches and their impact on interpreting Epipaleolithic lifeways. We focus here on the advantages of a broader technological analysis of EP assemblages at Kharaneh IV for the insights provided on learning, skill, and community in the past, as well as analytical rigor and comparison in the present.

Maher, Lisa [171] see Barket, Theresa

Maher, Lisa [171] see Macdonald, Danielle

Mai, Javier [115] see Spenard, Jon

**Maisel, Mary (University of South Florida), Katherine Dunning (University of South Florida) and Jonathan Bethard (University of South Florida) [102]**

*Investigating the Future of Adult Age Estimation*

According to Buikstra and Ubelaker (1994), there are seven primary categories for the age estimation of osteological remains. However, other age categorization schemes exist which differ slightly in their strategies. Moreover, life stages over 50 years of age are poorly represented among most categorization schemes. It was observed that comparative analysis of the different categorization schemes may lead to better understanding of fellow bioarchaeologists' methods and overall improved communication of findings. The main objective of this poster is, then, to present the results of a survey aimed at determining factors that influence adult age estimation in skeletal analysis, such as the thought processes impacting the delineations between age ranges of skeletal adults and, notably, how academics and professionals distinguish stages of life after age 50. An IRB-approved survey has been developed and is being disseminated anonymously via Qualtrics through various professional networks of archaeologists and anthropologists who have a connection to bioarchaeological analyses. Results from this survey will elicit both qualitative and quantitative data which will illuminate perceptions of how bioarchaeologists approach interpreting age-at-death estimates from the skeleton.

Maki, David [98] see Arnott, Sigrid

**Makowski, Krzysztof [139]**

*The Role of Pachacamac and Castillo de Huarmey in the Wari World: A Comparison*

Excavations since 2005 at Pachacamac (Lurin Valley) near Lima and since 2010 at Castillo de Huarmey (Huarmey Valley) have provided important new evidence about the character and chronology of these two sites, considered by Menzel to be religious and political centers of the Wari Empire. Both sites were contemporaneous, approximately AD 800–1100, and share the cosmopolitan culture typical of the Middle

Horizon. However, only in the case of Castillo de Huarmey, through the existence of the palace structure, the necropolis with three groups of mausoleums, and the workshops run by skilled foreign artisans, is there clear evidence to indicate that it was a regional capital of the empire. The evidence from Pachacamac is much more modest compared to Castillo and the iconography of the famous wooden idol suggests that the artisans who carved it and the ideas came to Lurin from the north.

Maksudov, Farhad [79] see Bullion, Elissa

Makulbekova, Madina [181] see Coil, Reed

**Maldonado, Blanca (Colegio de Michoacán)**

[13]

*Discussant*

[13]

*Chair*

**Maldonado, Blanca (Colegio de Michoacán), David Larreina-Garcia (UPV-EHU: University of the Basque Country), Andres Sanchez (Colegio de Michoacán), Berenice Pedroza (Escuela Nacional de Antropología e Historia [ENAH]) and Luis Velázquez-Maldonado [125]**

*A Technological Reconstruction of Preindustrial Copper Smelting in Central Michoacan, Mexico*

The earliest evidence for copper metallurgy in Mesoamerica comes from West Mexico, dating to ca. AD 800. Over a period of approximately 700 years, a wide variety of artifacts was manufactured, typically decorations and other valuable non-utilitarian items from several contexts. After the Spanish conquest, the colonizers assumed control of the local copper industry, employing native miners and smelters, who for decades carried on their metallurgical techniques. Little is known about the manufacture and the organization of production of this craft. Archaeological research at the site of Jicalán Viejo (ca. 1400–1609), in central Michoacán, has recently located potential production areas where concentrations of manufacturing slag and other smelting byproducts were recorded. Slag analysis has the potential for revealing critical information about metallurgical technology. Copper smelting slags recovered from Jicalán Viejo are analyzed for microstructure and compositional properties using optical microscopy, X-ray fluorescence spectroscopy (XRF), and scanning electron microscopy with energy-dispersive X-ray spectroscopy (SEM/EDS). Preliminary results indicate a smelting technology that used sulfidic ores and highly efficient furnaces. While further archaeological investigations are required to precisely date these activities, this technological information is important for establishing the context and scale of production of metal goods in ancient Mesoamerica.

Maldonado, Blanca [13] see Castro Montes, Diana Patricia

Maldonado, Blanca [13] see Corona, Néstor

Maldonado, Blanca [13] see Larreina-Garcia, David

Maldonado, Blanca [13] see May-Crespo, Jose

Maldonado, Blanca [13] see Pedroza, Berenice

Maldonado, Blanca [13] see Sanchez Guerrero, Andres Francisco

Maldonado, Blanca [13] see Velázquez-Maldonado, Luis

**Maldonado, Ronald (Westland Resources)**

[136]

*The Impact of COVID on Community Collaboration on the Navajo Nation*

In 1999, the Navajo Nation Historic Preservation Department (NNHPD) became a Tribal Historic Preservation Office, under 36 CFR Part 800, Section 106 of the National Historic Preservation Act 1966, as amended. This action enabled the Navajo Nation to enforce the Navajo Nation Cultural Resource Protection Act (CRPA), Navajo Nation Code Title 19 Section 1001, passed by the Navajo Nation Council. CRPA gave

the NNHPD the authority to defend, protect, and preserve Navajo Nation Cultural Resources. Under this code, several policies were created to manage and collect information on the resources; the one that concerns this issue is the Traditional Cultural Property Policy. The policy mandates that Chapters (area of local government), government officials, and residents be consulted as part of the undertaking. The policy focuses on the more familial and local TCPS in a community that could be impacted. Community residents were given a voice in the management and preservation of resources; COVID would impact these voices.

**Mallios, Seth**

[98]

*Legendary Landscapes, Community Access, and Continued Relevance at the Nathan Harrison Site in San Diego County, California*

The Nathan Harrison Historical Archaeology Project, a 20-year undertaking that sought to understand and communicate the life and legacies of San Diego County's first African American homesteader, employs orthogonal thought and archaeological, anthropological, and historical tools of analysis to bring marginalized voices to diverse publics. The remote mountaintop site was home during the late nineteenth and early twentieth centuries to Nathan Harrison, who was born into slavery and endured horrors of the Antebellum South, the mania of the Gold Rush, and racial injustices of the Old West. Harrison, who has become celebrated as the region's first permanent African American, gained mythical status during his life and after his passing; while alive, he was embraced by multiple communities, and his story has since been used by different groups over time for a variety of causes. This paper examines how Harrison's archaeologically identified historical minstrelsy and the identity politics of the nineteenth-century Old West have continued relevance in the twenty-first century and the many ways the Nathan Harrison Historical Archaeology Project has been able to increase access to the site and its major discoveries.

**Mallol, Carolina, Margarita Jambrina-Enríquez (Universidad de La Laguna), Gilliane Monnier (University of Minnesota), Gilbert Tostevin (University of Minnesota) and Goran Pajovic (National Museum of Montenegro)**

[240]

*Clues about Neanderthal Fire Technology and Climate from a Microstratigraphic Study of Unit XXIV at Crvena Stijena, Montenegro*

A trend in the past few decades of archaeological research is to apply different microstratigraphic techniques, which provide clues about behavioral and paleoenvironmental aspects of past societies. At Crvena Stijena (Montenegro), a Middle Paleolithic site under current multidisciplinary investigation, lipid biomarker data has informed us about the paleohydrological evolution of the entire sequence, and other high-resolution techniques such as archaeomagnetism and Raman microspectroscopy have provided useful clues about the formation of Unit XXIV, a rich archaeological stratified deposit with visible combustion residues. Here, we couple soil micromorphology and lipid biomarker analysis and provide new data about different aspects of fire technology, climate, and some of the taphonomic processes associated with Unit XXIV, which we interpret as a sequence of in situ and reworked anthropogenic deposits related to different activities involving fire. These activities took place under cold, humid conditions and were affected by soft-sediment deformation due to extensional and compressional forces from mega-block roof spall and possibly sinkhole subsidence.

**Malloy, Kevin (Environmental Resources Management [ERM])**

[192]

*Making the Case for "Zombie Trees": Intangible Cultural Heritage Management in Guyana*

Recent discoveries of substantial offshore oil and gas reserves and large-scale international development projects highlight the need to identify and preserve Guyana's poorly documented cultural heritage. At particular risk of destruction are some of Guyana's Silk Cotton (*Ceiba pentandra*) trees, which serve as tangible markers of one aspect of the country's intangible cultural heritage. These trees are believed to be imbued with dark spirits tied to the Dutch colonial era, are described in folklore as "zombies" and home of

the “Dutchman Jumbie,” and are frequently met with suspicion and fear by local residents. Given the limited legal protections and relatively few local Guyanese cultural heritage specialists, preservation of these trees based on their connection to intangible cultural heritage may rely on the responsible actions of developers and input from knowledgeable cultural resource experts from the international community. While advocating for the preservation of intangible cultural heritage tied to folklore can prove challenging, considering the project effects on these resources is equally as important as considering such effects on tangible cultural heritage (e.g., archaeological and historic structures). Yet, with limited extant cultural heritage documentation, Guyana stands to lose important resources as it undergoes significant economic development.

**Malone, Lauren (University of Tennessee, Knoxville), Gerald Schroedl (University of Tennessee, Knoxville) and Anneke Janzen (University of Tennessee, Knoxville)**  
[71]

*ZooMS Analysis of Sea Turtle Bone Disks from Brimstone Hill Fortress, St. Kitts, West Indies*

The bone button industry of the eighteenth and nineteenth centuries at Brimstone Hill Fortress on the eastern Caribbean island of St. Kitts is well documented. Here, British soldiers and enslaved Africans manufactured single-hole bone disks that likely served as cores for cloth covered buttons. Tens of thousands of these disks and removals have been recovered at the site. Most disks are made from cattle bones, but enslaved African contexts yielded greater numbers of buttons made of sea turtle bones. However, the particular species of sea turtles are unidentified. Today, leatherback, green, and hawksbill sea turtles nest on the beaches of the island, while only one historic sighting of a loggerhead turtle in the surrounding waters has been recorded. Zooarchaeology by Mass Spectrometry (ZooMS) offers a way to identify worked bone material through collagen peptide mass fingerprinting. Here we present ZooMS results of sea turtle bone buttons from an enslaved African context (BSH 2), and barracks occupied by soldiers (BSH 5), which allows for exploring differences in access to sea turtle and selection of sea turtle species. These results also provide valuable data on sea turtle populations in St. Kitts in antiquity.

Malone, Lauren [203] see Janzen, Anneke

Maloney, Jillian [113] see Braje, Todd

Maloney, Jillian [62] see Futtly, James

Maloney, Jillian [62] see Lancaster, JD

**Maloy, Kelsey**  
[155]

*A Needed Audit in Perspective around Culturally Modified Trees within the Pacific Northwest*

This paper is a critical appraisal of cultural resource management protocols associated with Indigenous Culturally Modified Trees, (CMTs). Living artifacts, eco-facts, or vivio-facts provide rich and powerful accounts of human interactions with a setting. These features challenge western views of what constitutes materiality of the past, a recognition, often overlooked in western trained academic archaeology. This focus appreciates diverse perspectives and impacts within the assessment and legal handling of CMTs, focused within the Western Cascades of Washington State. This paper is based on the reassessment of five previously documented Bark Stripped Cedar sites between Snohomish and Skagit County, Washington. The purpose of consultation with local experts is to assess the quality of current common professional practice to support local Indigenous values or viewpoints in documentation procedures. Herein lies a reciprocal learning opportunity that is designed to advance nonwestern management and perspective in preservation around these resources. An exercise in listening can strengthen archaeological university-level training, field inventory planning strategies, management practices and greater public discourse around Traditional Cultural Places of Patrimony and significance of nonwestern stewardship values.

Mamani, Manuel [189] see Turley, Samantha

Mamirov, Talgat [141] see Coco, Emily

Manahira, George [133] see Buffa, Danielle

**Mandel, Rolfe (Kansas Geological Survey)**

**[54]**

*Searching for the Early Archaeological Record in the Big Bend Region of Southwest Texas: A Lithostratigraphic Approach*

During the 1930s and 1940s, Kirk Bryan and Claude C. Albritton Jr. studied the stratigraphy of late Quaternary alluvial fills in the Chihuahuan Desert of the Big Bend region, southwest Texas. A significant outcome of that work was the recognition of three stratigraphic units that were differentiated based on lithologic properties, especially color and carbonate morphology. They referred to those units as the Kokernot, Calamity, and Neville formations and used them to place the regional archaeological record into stratigraphic contexts. Recently, I reinvestigated and expanded Bryan and Albritton's work in order to develop a formal lithostratigraphic framework for Holocene and terminal Pleistocene alluvium in Big Bend. The formations established by Bryan and Albritton, plus an additional lithologically distinct body of sediment, are now formal members of a single lithostratigraphic unit: the Lykes Formation. The oldest member is the Neville, which aggraded between 14.1 and 7 ka. Buried paleosols in the Neville represent former stable geomorphic surfaces with high potential for containing Paleoindian and Early Archaic cultural deposits. Hence, the development of a lithostratigraphic framework has created a powerful tool for determining where the early archaeological record is likely to occur in stream valleys of the Big Bend region.

Mandel, Rolfe [88] see Baka, Abby

Mandel, Rolfe [15] see Norman, Lauren

**Mangut, Chiamaka (Columbia University)**

**[46]**

*A Survey of Hilltop Settlement in Northern Jos Plateau, Nigeria: A Preliminary Report*

A reconnaissance of Dutsen Kura hill was carried out in June 2022. It is claimed that former occupants of the hill had ancestral links with Dutsen Kongba, a sixth millennium BC Later Stone Age hill settlement located in the same region. In addition, the present-day Bace group living in the plains in Dutsen Kura claims an ancestral link with former occupants of Dutsen Kura. The study revealed circular stone structures identified as house foundations observed on the flat surface of the hill, most of which were in clusters of 4–20. Also identified within these clusters were grinding hollows on boulders and ceramics. Rockshelters with evidence of occupation such as ceramics and lithics were identified on the hill. This pilot study confirms that people lived on the hill in the past, making the site viable for excavation. Study of the excavated materials may yield more evidence of occupation and early radiocarbon dates, which may either confirm or refute the claimed cultural links between Dutsen Kura and Dutsen Kongba on the one hand, and the historical peoples living on the plains.

**Manhas-Tamoria, Raveena (University of York), Estelle Praet (University of York) and John Schofield (University of York)**

**[155]**

*Waste Landscapes at UNESCO World Heritage Sites: Challenging the Criteria*

World Heritage sites are subject to a host of threats and impacts, be it from socioeconomic pressures, climate change, or natural disasters. In more recent times, the threats from waste and, in particular plastic pollution, has become far more prevalent at various UNESCO sites around the world. There is indeed a growing concern over marine plastic debris at natural coastal sites such as the Galapagos Marine Reserve and Papahānaumokuākea National Marine Monument in Hawai'i. Archaeological sites, such as Machu Picchu and

Angkor Wat face a growing anthropic pressure on the sites themselves and on waste management systems of the fast growing nearby towns relying on tourism. Waste impacts the aesthetics and the values associated with cultural and natural heritage, something at the core of selection criteria to be included on the UNESCO World Heritage List. This paper explores the relationship between UNESCO status and waste landscapes. While the World Heritage status facilitates unprecedented tourism and ensued waste mismanagement, the outstanding universal values, a condition for those sites to remain on the list, are directly threatened by impacts of waste and plastic pollution.

Manney, Shelby [124] see Heilen, Michael

**Manni, Franz (Musée de l'Homme, Paris, France)**

[226]

*Chair*

**Manni, Franz (Musée de l'Homme, Paris, France), Laurence Glémarec (Musée de l'Homme, Paris, France), Liliana Huet (Musée de l'Homme, Paris, France) and Martin Friess (Musée de l'Homme, Paris, France)**

[226]

*Body Modifications in the Collections of the Musée de l'Homme (Paris)*

The Musée de l'Homme hosts several collections corresponding to body modification practices. The collections correspond to body piercing (prehistoric artifacts, casts of living individuals from the nineteenth century, and early photographic images) and to other types of body modification: intentional cranial modifications of various types and origins (circumferential and antero-posterior modifications from Europe, Oceania, and precontact Americas), tooth filings from Africa and Oceania, foot binding from China, etc. We will describe how these collections have converged to the museum over the years, discuss their geographic coverage, mention how we are updating the description of the pieces by following modern systematic body modification classifications, and envisaging a 3D-scan catalogue. A part of these collections has been successfully exhibited to the public at the museum (2019); therefore, practical aspects related to the making of the show will also be reviewed, including feedback. Body modifications can be a transversal theme common to many anthropological and art museums, leading to interesting joint-ventures exploring human anthropological diversity and continuity in an appealing way.

Manni, Franz [226] see King, Paul

Mar, Ricardo [61] see Matos, Ramiro

**Marciniak, Arkadiusz (Adam Mickiewicz University in Poznan)**

[251]

*Discussant*

**Marciniak, Arkadiusz (Adam Mickiewicz University in Poznan)**

[203]

*The Demise of the European Neolithic Mode of Animal Husbandry: A Combined Effect of Milk Consumption, Zoonotic Diseases, and Genetic Changes*

A new form of husbandry developed by the Neolithic settlers of Europe provided solid foundations for their unprecedented growth and sustainability. Its constituting elements comprised the secondary product's mode of exploitation, the effective adaptation of major domesticates to different environmental and ecological zones, and changes in their genomes. However, the persistence of the European Neolithic mode of husbandry was not long-lasting. In subsequent centuries, dysfunctions in its different elements were becoming increasingly evident. In this paper, I will discuss three major effects of practices introduced by the Neolithic farmers that ultimately contributed to the demise of this form of husbandry and also led to the

breakdown of the European Neolithic mode of sustainability. These comprise: (a) the disastrous effects of excessive milk consumption among lactase non-persistence local farmers; (b) the emergence of infectious zoonotic diseases and their harmful consequences; and (c) the acceleration of natural selection and its unforeseen outcome. The paper will also discuss the advancement of methods that make this study possible. These comprise an intertwined application of such methods as aDNA, eDNA, lipids analysis, and GMM, in addition to traditional zooarchaeological methods. The preliminary works on the Balkan and Central Neolithic will be presented.

Marciniak, Arkadiusz [184] see Kuijt, Ian

**Marcone, Giancarlo (University of Engineering and Technology [UTEC])**

[12]

*Lima Culture: Bridging Domestic and Political Economy*

Despite having been central during the pioneer years of Andean archaeology, we understand little of the Lima Culture (circa AD 50–900). Is the Lima culture a political formation or several political formations that share a common territory? How was this society organized politically? On what was political power based in Lima society? Researchers have tended to answer these questions through dichotomies: (1) A strong local development or by-products of interaction with foreign societies; (2) It is based on agricultural-economic centralization or a society based on the participation of elites in international networks. As if the entire Lima culture had responded as a unit to a single type of stimulus. We propose to address these questions recognizing the structures of Lima society, but also the practice of the actors who, at different levels, interpret, refute, and transform these structures. Understand the political economy of Lima society as the result of the permanent tension between these actors' domestic economies. The Lima culture comprised a series of relatively independent groups that shared a system of ideas and beliefs. At the onset of the middle horizon, there is evidence of a process of integration that is both local and external.

**Marean, Curtis (Arizona State University)**

[212]

*Total Station Archaeology: Digging the Dibble Way*

The methods that we use to excavate archaeological sites shape the resulting data in an unchangeable manner and have significant downstream impacts on our ability to study and interpret our data. In 1987 Harold Dibble published "Measurement of Artifact Provenience with an Electronic Theodolite" and ushered in a revolution in the quality of field data collection. Through the years, Dibble and his colleagues have shown how the precision, accuracy, and speed of find plotting with total stations significantly improves our understanding of context and the archival quality of our data. This has been done through publications that directly compare plotting with and without total stations, as well as the quality of field reports published by him and his colleagues. Inadvertently, Dibble created a quiet schism in field archaeology between those who embraced this technology and those who did not. In this paper I track the impact of this methodological improvement, suggest some pathways for the future, and call for a full commitment in Paleolithic archaeology to "digging the Dibble way."

**Marengo Camacho, Nelda Issa (University of California, Riverside), Judith Ruiz (Instituto de Investigaciones Antropológicas) and Carlos Serrano Sánchez (Instituto de Investigaciones Antropológicas)**

[58]

*Alimento para las deidades: Nuevas prácticas sacrificiales y post sacrificiales en los centros mesoamericanos del Epiclásico y Posclásico inicial*

Durante las últimas décadas se han documentado varios conjuntos de restos humanos no reverenciales y altamente procesados en diferentes estados de manipulación dentro el territorio de Mesoamérica. En un principio se les apreció como hechos aislados hasta percibir que forman parte de un proceso de intensificación de programas sacrificatorios amplios y con características peculiares; tras la caída de

Teotihuacán aumenta el número de víctimas encontradas en el registro mortuario de una pluralidad de sitios del Altiplano mesoamericano del Epiclásico y Posclásico Temprano: La Quemada, Tula, Teotenango, Cacaxtla, Xochicalco, Teopanzolco, Cholula y Tehuacán. También es notable reconocer en sus registros la creciente diversificación de las formas de muerte ritual y de manejo póstumo del cuerpo, como el desuello, la excarnación y la exhibición de partes corporales, por mencionar algunos. Nuevos usos culturales, en un amplio marco de interacciones entre grupos, dan lugar a comportamientos de respuesta sociopolítica y militar. Es particularmente notable el contexto de movilidad poblacional en que se dieron muchos de los depósitos no funerarios del Este mesoamericano. Tal parece que la diáspora posterior al denominado colapso maya introdujo nuevas coreografías rituales en esta área, como ilustramos los programas sacrificiales de Toniná, Largartero y Chichen Itzá.

Marian, Sandra [136] see Higgins, Howard

Mariani, Guido [87] see Negrino, Fabio

**Marino, Eugene (US Fish and Wildlife)**

[231]

*Discussant*

Marino, Maeve [18] see Shaeffer, Megan

**Marino, Marc (University of Arkansas), Wesley Stoner (University of Arkansas) and Lane Fargher (Centro de Investigación y de Estudios Avanzados de)**

[247]

*Reducing Collective Action Problems among Larger-Scale Societies: Building Trust, Assurance, and Cooperation at Late Postclassic Tlaxcallan, Mexico*

Collective action problems arise when individuals expend energy or resources to obtain a common goal or outcome. However, conflicting interests hinder cooperation and preclude joint action. Visibility and trust are two factors that reduce collective action problems among small and mid-sized groups, but research is limited on how these variables affect cooperation in larger-scale societies. Trust is often reduced in larger organizations because all participants do not interact on a face-to-face basis. Developments in game theory and collective action research have demonstrated that interaction among participants at smaller scales can build trust and offer assurance that most participants will not “free-ride,” thereby facilitating cooperation. We explore this theory at a large scale, using a case study from Tlaxcallan, Mexico. Ethnohistoric accounts suggest the multiethnic confederacy was comprised of multiple competing sociopolitical interests, yet cooperation was achieved in resisting Aztec conquest and constructing council-based governance. Cooperative institutions are revealed by “egalitarian” iconography visible on public architecture. Similar iconography found on Codex-Style Polychromes recovered from households is examined to determine if participants in different barrios consumed this ideology. While not all households participated, efforts to build visibility and trust and reduce competitive tensions among a multiethnic population are indicated.

Marion, William [14] see Datta, Ranjan

**Marken, Damien (Bloomsburg University)**

[165]

*Discussant*

**Marken, Damien (Bloomsburg University), Olivia Navarro-Farr (College of Wooster) and David Freidel (Washington University, St. Louis)****[93]***Something Different or More of the Same? Lowland Maya Polities and Regimes as Viewed from El Perú-Waka', Guatemala*

Classic period (250–900 CE) politics of the Lowland Maya have been the subject of intense debate among scholars for decades. Having long ago moved beyond unsupported models of peaceful theocracies and vacant ceremonial centers, investigators nevertheless continue to wrestle with characterizing the nature of Classic political structure. This paper will reconstruct the evolving nature of the political regime(s) housed within the Maya city of El Perú-Waka', Guatemala. Our goal is to more fully explore patterns and variability in how Maya rulers and their elite allies exercised political power in the context of a continuously shifting geopolitical environment through the synthesis of over 20 years of archaeological settlement studies, monumental and mortuary analyses, and epigraphic research.

Marken, Damien [129] see Horowitz, Rachel

**Markert, Patricia (Western University)****[217]***Five Generations at the Stagecoach Inn: A Ruin at the Intersection of Historic Migration(s) in D'Hanis, TX*

The Stagecoach Inn in D'Hanis, Texas, sits at the intersection of multiple migrations and acts of place making in nineteenth- and twentieth-century Texas. The limestone and sandstone ruin, obscured by brush from the closest gravel road, was once the most prominent and visible marker of a small Alsatian settlement on the Texas "frontier." An inn is built to accommodate movement—the stagecoach line brought a steady stream of travelers during the mid-nineteenth century—but beyond those transitory passings-through were the families that resided in the house, the structure as both dwelling and home. In this paper, I trace five generations of residents at the inn across several intersecting migrations: Alsatian and German immigration to Texas, the violent displacements of settler colonialism, the forced migration of enslavement, and migration from Mexico amid the Mexican Revolution. Using 3D photogrammetry and architectural drawings, I examine the material (and now digitized) remains of the structure and the choices that shaped it through time. Looking outward from its walls, I question how people mark the space-time of migration, past and present, on the built landscape and what that means for a community-based archaeology of place and migration in the present.

**Marks, Theodore (New Orleans Center for Creative Arts), George Leader (College of New Jersey), Abi Stone (University of Manchester), Rachel Bynoe (University of Southampton) and Dominic Stratford (University of the Witwatersrand)****[114]***Narabeb Pan: Exploring Middle Stone Age Archaeology of the Namib Sand Sea*

The vast Sand Sea region of the Namib desert in western Namibia has begun to yield evidence of long-term human occupations. In the past decades, several Early Stone Age (ESA) sites have been identified and described but the Middle Stone Age (MSA) human presence remains poorly understood. Here we describe in detail the newly documented site of Narabeb Pan, a site situated deep in the dune fields that is the first to provide a tentative estimate for the chronology of Late Pleistocene MSA occupation of the Sand Sea. We also examine recent evidence for an unexpectedly high degree of dynamism in the region's unique environment, with implications for broader questions of MSA land use patterns and adaptive flexibility. Together, these data help fill in important gaps in our current understanding of diversity in Late Pleistocene human adaptations in Southern Africa.

Marks, Theodore [212] see Leader, George

**Marojevic, Vasilije (University of Minnesota), Zoran Kilibarda (Indiana University Northwest), Gilbert Tostevin (University of Minnesota) and Alec Siurek (Indiana University Northwest)**  
[240]

*A Preliminary Overview of the Lithic Raw Material Outcrops Southeast of Crvena Stijena (Area of Vilusi–Grahovo–Boka Kotorska), Montenegro*

The Crvena Stijena rockshelter is located on the Banjani Karst Plateau in westernmost Montenegro. Excavations at one of the longest human occupation sequences in the Balkans yielded 20 Middle Paleolithic layers containing numerous artifacts and faunal remains. Recent investigations of MP strata raised questions regarding the nature of Neanderthal occupation at the site as well as mobility and land-use strategies. Since raw material studies provide the ideal framework for understanding hunter-gatherer territories, our study aims to present the first integrated approach to the lithic raw materials exploited by the Neanderthals from Crvena Stijena. Fieldwork in June 2022 focused on early Jurassic shallow-water formations from the Adriatic Carbonate Platform and Triassic-Cretaceous deep-water bedded chert and pelagic limestones from the Budva Zone, both south of Crvena Stijena. Three localities within the Adriatic Carbonate Platform contained oblate grayish to white chert nodules. Two localities in Budva Zone in coastal Montenegro contained reddish, greenish, or grayish bedded chert. In total, 26 samples have been selected for petrographic analysis, while the XRF analysis determined the chemical composition of 30 samples. We present the results of the preliminary investigation and discuss their implications for Neanderthal raw material procurement and technological behavior.

**Maroney, Kendra**

[143]

*Chair*

**Maroney, Kendra**

[143]

*Engaging Youth in Archaeology and Cultural Resources: Examples from the Kalispel Natural Resources Department*  
The COVID-19 pandemic has drastically changed in-person interactions and typical outreach and educational events. The Kalispel Natural Resources Department and Cultural Resources Program strived to stay engaged in education throughout this difficult time and focused on delivering stand-alone content to share with local youth. The goal was to produce materials that integrated the Tribe's Salish language with natural and cultural resources to reflect Kalispel values. Bilingual information cards, activity books, and posters were created. These items were distributed to the Kalispel Language Survival School, the Camas Early Learning Center, and the local schools and made digitally available to promote use at home or in the classroom. These efforts are examples of how archaeology, natural resources, language, and culture are connected and shared within a community.

Maroney, Kendra [143] see Peterson, Jenna

**Marquardt, William (University of New Mexico, United States Forest Service)**

[234]

*Chair*

**Marquardt, William (University of New Mexico, United States Forest Service), Meghan Caves (Umatilla National Forest), Autumn Myerscough (University of New Mexico) and Tim Lewis (Umatilla National Forest)**

[234]

*Developing More Holistic Approaches to Cultural Resource Inventories: Results from a Salvage Survey on the Umatilla National Forest, Southeast Washington*

Most heritage surveys conducted by Federal agencies in compliance with the National Historic Preservation Act (NHPA) focus exclusively on archaeological resources. This approach has resulted in the effective documentation and preservation of archaeological sites but has led to gaps in our understanding of a wide variety of cultural resources. For the last several years, National Forests have been encouraged to develop

more holistic approaches to cultural resource management on their units. In 2022, the Umatilla National Forest proposed to conduct a roadside and area salvage sale within the Lick Creek Fire footprint which burned approximately 80,000 acres in the Pomeroy Ranger District. A cultural resource inventory design incorporating ethnographic and ethnobotanical survey was developed and implemented on 700-acre sample of the salvage project area. The results of this survey highlighted the interrelatedness between archaeological sites in the northern Blue Mountains, the natural world they are sited in, and the contemporary cultures who rely upon this land for physical and spiritual sustenance. A better understanding of the Blue Mountains as a cultural as well as natural resource also provides a much-needed human element to the development of Forest projects situated in Traditional knowledge and lifeways.

**Marques, Sophia (University of Virginia)**

[73]

*The Late Intermediate Period and Late Horizon in Valle de Mairana, Bolivia*

Statistical and GIS-based analysis are applied to summarize the findings of preliminary auger testing, survey, and site reconnaissance conducted in July and August 2022 in the Valle de Mairana, Bolivia. In depth profiles of eight possible Inka-period sites were created and compared. The Valle de Mairana spans the municipalities of Mairana and Samaipata in the province of Florida in the department of Santa Cruz. During the Late Intermediate period (LIP) and Late Horizon (LH) the Valle de Mairana was an area of intensive agricultural production and remains so today. The local LIP ceramic style is associated with the Mojocoya culture and much remains to be understood about Mojocoya interactions with the monumental Inka settlements nearby. The present research seeks to lay the foundations for future work in the area.

**Marreiros, Joao (MONREPOS-RGZM—ICArEHB, UAlg), Ivan Calandra (MONREPOS-RGZM), Lisa Schunk (MONREPOS-RGZM), Walter Gneisinger (MONREPOS-RGZM) and Eduardo Paixao (MONREPOS-RGZM)**

[33]

*The Role of Artifact Functional Analysis in Understanding Variation in the Archaeological Record: Assessments from Studies on Tool Design and Use*

Understanding artifact variability observed in archaeological assemblages may untangle key dynamics marking the evolution of major human behavioral traits. Variability likely reflects technological changes allowing early hominins to respond to dynamic Pleistocene environments and evolving sociocultural processes. Techno-typological studies are crucial for characterizing when and where changes in production, design, and artifact maintenance occurred. Although such variability is perceived over time in different regions, reconstructing the nature of technological innovations remains limited, obscuring the character of the underlying behavioral demands, neglecting triggering processes, and distorting our understanding of major evolutionary steps. Artifact functional analysis may fill this gap by investigating traces of use and correlating these to variability within tool production and design. Controlled experimental replication allows to build comparative reference-frames and to evaluate questions on raw material, tool design, and performance. This approach is fundamental for assessing assemblage functional variability and facilitates identification of new classification features. It provides crucial evidence to infer on functional and economic aspects of artifacts, subsistence behavior, and processes of cultural trait transmission. We will outline recent developments in the discipline, including aspects of research design and data acquisition, while discussing case studies tackling questions related to artifact variability in the Pleistocene record.

**Marroquín, Alma (Universidad San Carlos de Guatemala) and Anna Bishop (University of Texas)**

[236]

*Managing a Tikal Outpost: The Palace and Associated Architecture*

La Cuernavilla's palace complex is made up of 14 elongated structures around two internal patios seated on a wide raised platform. Its location at the foot of the escarpment in the extreme northeast of the Lower East

Group protects and restricts its access from the surrounding Buenavista Valley. Causeways into the escarpment connect the group to other monumental complexes on top of the cliff. The palace is bounded by three residential groups to the south and a massive elongated structure to the west. This building, Structure Q1-45, is characterized by the presence of multiple doors leading to a long gallery. Fragments of sculpted painted stucco on its southern platform façade indicate both the sociopolitical importance of the structure and La Cuernavilla as a whole. The residences span from the Preclassic to the Terminal Classic periods, and three humble burials suggest a lower social status than the palace occupants. The entire Lower East Group is bound by linear defensive and hydrological features so the south and a cival and bajo provide natural protection to the west and east respectively. Overall, the Lower East Group blends a residential and domestic environment with government activities of an administrative, economic, and ceremonial nature.

**Marshall, Aubree (Michigan State University), Gabriela Murphy (Michigan State University) and Gabriel Wrobel (Michigan State University)**

[102]

*Serious Seriation: Age-at-Death Assessment of Skeletons from Caves Branch Rockshelter, Belize*

The Caves Branch Rockshelter (CBR) is a large cemetery site in Central Belize used for burial by a rural Maya community during the Late Preclassic and Early Classic periods (~300 BC–AD 400). The CBR skeletal series is unusual in the region as it is large and appears to comprise a relatively complete mortality profile. However, due to poor preservation, different aspects of the biological profile have been difficult to assess. In this study, we explore age-at-death estimation by seriating individuals based on the extent of dental attrition and using standard mortality profiles to place individuals into age groupings. Additionally, for each individual, we calculate rate of wear by comparing attrition between first, second, and third molars.

**Marston, John (Boston University)**

[51]

*People-Plant Relationships in Long-Generation Arboreal Fruit Cultivation*

The study of human-plant relationships in archaeology is rich and varied, including gathering, cultivation of wild species, domestication, intensive agriculture, and nonfood uses of plants. People-plant relationships in agricultural entanglements, however, have primarily focused on the cultivation of cereals, pulses, and other annual plants. Over the course of a human lifetime, an individual farmer will interact with tens of generations of plants. Such cases have formed the basis of most discussions of people-plant entanglements, yet are only one type of relationship into which humans and cultivated plants can enter. Long-lived perennial cultivated trees, here termed “long-generation arboreal crops,” form distinct, complex relationships with human societies as they transcend single human lifespans. A single tree might see cultivation by 10 generations of humans, reversing the time scales of interaction between human and nonhuman species. Attention to this temporal dynamic dramatically influences the ways that communities of plants shape communities of humans across deep time. Examples from both Eurasia (apples, citrus) and the Americas (avocado) illustrate the distinct ecology of these plants and the distinct bodies of ecological knowledge required to establish enduring human-plant relationships with these species. Such studies give new insights into the complexity of human-plant domesticatory relationships.

Marston, John [68] see Tang, Yiyi

**Martens, Vibeke (NIKU—Norwegian Institute for Cultural Heritage Research) and Jens Rytter (Norwegian Directorate of Cultural Heritage Research)**

[173]

*Climate and Heritage in the Arctic: Environmental Monitoring and a New European Standard*

To respond to climate change impacts as well as other societal and environmental impacts to archaeological preservation, Norway has been applying environmental monitoring of archaeological deposits and sites since the 1990s. To standardize monitoring methods, tools, and evaluations, a Norwegian Standard was implemented in 2009. Now, a new European Standard is taking its place, enabling international intrasite

comparisons, as well as giving tools to enable intrasite prioritization through more complete combined threat evaluations. The CULTCOAST research project in Arctic and sub-Arctic Norway has established environmental monitoring points, gathering data since 2020 (Svalbard) and 2021 (Andøya). Through research cooperation with both Norwegian and European research projects, the CULTCOAST researchers have also involved local communities, heritage management agencies, and international actors such as cruise ship operators in heritage monitoring and work on adaptation measures. This paper will introduce the new European Standard on archaeological environmental monitoring, and present results from monitoring, community involvement, and co-creation of knowledge in the CULTCOAST research project, using site data from Svalbard and Andøya in Norway.

**Martí Gil, Irene**

[185]

*Native American Identity through the Critical Discourse Analysis of NAGPRA: Parties, Politics, and Prospects*

The goal of this project is to show the significance of language in the cultural heritage management and protection efforts. In heritage law, language is the tool that reifies morals into (looked-for) action, thus shaping behaviorism. Since legalese defines what heritage is, it affects the way that archaeologists see, understand, act on, and preserve heritage. Therefore, examining the legal language used to draft the laws safeguarding cultural patrimony is a solid strategy to identify the dogmatic notions that underpin anthropological practice and to assess their validity today. In this project, I apply Critical Discourse Analysis on the 1990 Native American Graves Protection and Repatriation Act (NAGPRA) to study the connection between cultural heritage and identity, and its reflection in legal language. The analysis delves into the construction of the legal Native American identity through explicit and implicit linguistic strategies, which are proven to be outdated, inaccurate, and based on antagonistic relationships of otherness that are not only essentialist, but potentially harmful. Also, it focuses on advertent and inadvertent ambiguities, contradictions, and biases that affect the adequate enforcement of the Act. I propose to critically review the existing laws in order to build legally viable, fair, and inclusive cultural notions.

Martin, Debra [227] see Baustian, Kathryn

Martin, Devin [182] see Wynia, Katie

Martin, Houston [94] see Cannon, Kenneth

**Martin, John (Delaware Department of Transportation)**

[156]

*Discussant*

**Martin, Paul**

[174]

*Discussant*

[174]

*Chair*

**Martin, Paul and Lisa Lee (Institute of Canine Forensics)**

[174]

*Key Factors Impacting the Efficacy of Canine Resources on Archaeological Surveys*

Canine resources, used alone or as part of a multidisciplinary approach, are proven to be effective at assisting archaeologists in locating human remains. Just as geophysical instruments and analysts have limitations and factors that impact their success on surveys, so do canine teams. This paper will examine the key factors that determine successful outcomes for archaeologists utilizing canine resources as part of their survey

methodology. These factors include the appropriate uses of canine(s), selection of qualified canine team(s), site safety, environment, weather, age of remains, mortuary practice and taphonomy, and the condition of the canine team. Scenarios will be presented and the criteria applied in order to determine if a canine resource is likely to be successful, may be successful, or is unlikely to be successful.

Martin, Paul [174] see Tormey, Blair

**Martin, Simon (University of Pennsylvania Museum)**

[58]

*Chair*

[158]

*Discussant*

**Martin, Simon (University of Pennsylvania Museum)**

[11]

*After the Crisis: Epigraphic Data on Political and Cultural Developments in the Maya Lowlands 800–1000 CE*  
Maya inscriptions have long been considered an impoverished source on the momentous changes that gripped society at the close of the Classic era. Not only do we see a steep decline in quantity as major centers fall silent, but the texts that were produced tend to be shorter and focused on ritual rather than political events. However, this scarce resource is becoming more productive as we begin to appreciate the scale of a crisis that transformed the Maya lowlands soon after 800, and how political changes intermesh with cultural ones occurring at the same time. There was a major realignment of power as a few centers that not only survived but thrived and express a significant body of foreign traits and connections.

Martin, Steve [102] see Wampler, Marc

Martin, Terrance [140] see Schurr, Mark

Martindale, Andrew [113] see Letham, Bryn

**Martindale Johnson, Lucas (Far Western Anthropological Research Group Inc.)**

[243]

*Preliminary Analysis of Flaked and Ground Stone from Aventura, Belize*

Household investigations at Aventura recovered several primary stone materials common in northern Belize and elsewhere in the Maya Lowlands. Chert and chalcedony is common as well as a high relative proportion of obsidian indicating households had reliable access to toolstone. Ready and reliable access suggests resilient household economies. Technological analysis shows households obtained bifacial adzes and likely resharpened them several times indicating reduction know-how. Obsidian analysis shows blade use was common and the geochemical profile of 500 artifacts indicates obsidian from highland Guatemala dominate the assemblages with a low percentage of Mexican obsidian. Overall, preliminary analysis suggests chipped stone was vital for household tasks during the Classic period generally. A comparison of household lithic inventories is also provided in terms of both flaked and ground stone to discuss household diversity.

**Martinez, Desiree (Cogstone Resource Management)**

[1]

*Discussant*

**Martinez, Kelley****[171]***More than Presence or Absence: Improving Ground Stone Tool Analyses to Address Tool Manufacture, Use, and Maintenance Questions*

The presence of ground stone tools in an assemblage is often indicative of a long-term occupation or resource processing site. The technology represents diverse site activities, including subsistence, social, and symbolic aspects of Indigenous communities. Despite the importance of ground stone tools in the Pacific Northwest, the technology is often analyzed at a coarse level. Detailed analyses of ground stone assemblages inform on regional Indigenous raw material knowledge, resource use, tool manufacturing, and maintenance practices. As many ground stone analyses consist of a presence or absence or form equals function model, little is known about ground stone manufacturing and tool maintenance strategies. Applying experimental archaeology to ground stone technology replication and analysis offers a means to explore aspects of tool manufacture and use through raw material selection, reduction strategies, and use wear. An important aspect of this work is being able to visualize the production byproducts of ground stone tool manufacture.

Experimental tool replications suggest we can identify ground stone manufacturing and maintenance activities without the product being present, similar to flaked lithic technologies. This presentation discusses how ground stone tool analyses can be improved upon and the many research questions that can be addressed with more detailed analyses.

Martinez, Konane [115] see Spenard, Jon

**Martínez-Carrasco, Andrea (Institute of Archaeology, UCL), Patrick Quinn (University College London), Bill Silla (University College London) and Silvia Amicone (University of Tuebingen, Germany)****[59]***State Control of Production and Distribution of Inka-Style Pottery in the Southern Border of Tawantinsuyu (Inka State)*

This study aims to identify the nature and degree of state control over the production and distribution of Inka-style ceramics in Aconcagua Valley and Maipo-Mapocho basin (Central Chile) during the Late period (AD 1400–1536) and what role the Diaguita may have played in this process. The analysis focuses mainly on aríbalos and shallow plates, in relation to restricted vessels, and bowls of local styles from the Late Intermediate period (AD 1000–1400), as well as Diaguita and new non-Inka manifestations. The ceramics are characterized from the technological perspective of the *chaîne opératoire*, including the preparation and source of pigments and changes in firing. Analyses carried out at different scales, includes macro-traces (manufacturing traces), thin-section petrography, and compositional analyses (pXRF, XRD, SEM-EDS and LA-ICP-MS). Preliminary results are presented, focusing on identifying continuities and changes in production and distribution between periods and valleys, evaluating the influence of the Inka state, foreign specialists (Diaguitas) and local agencies.

Martinez de Velasco, Alejandra [52] see Vega-Villalobos, Maria Elena

Martínez-Flores, Guillermo [197] see Robles Montes, Mayra

**Martínez Lara, Mario (UNAM)****[65]***Las bodegas de Cacaxtla, Tlaxcala, México, un proceso de conservación y catalogación arqueológica*

En Cacaxtla-Xochitcatl, una vez que iniciaron las exploraciones en 1975, se construyeron dos bodegas y un museo que servirían como destino final de los materiales recuperados durante las excavaciones. Desde entonces, se ha obtenido una gran diversidad de materiales arqueológicos. En ese sentido y en aras de

cumplir con el compromiso que tiene el INAH Tlaxcala sobre la salvaguarda del patrimonio arqueológico, se propuso el proyecto “Revisión y organización documental de los materiales arqueológicos albergados en las bodegas de la Zona Arqueológica de Cacaxtla-Xochitécatl”. El proyecto inició en el año 2015 y se mantuvo activo hasta el año 2021. En ese tiempo se han realizado distintas fases de acción con el propósito de limpiar, reorganizar, clasificar y catalogar los materiales en aras de incentivar las investigaciones formales sobre la zona arqueológica. El objetivo es crear un espacio de almacenamiento con una dinámica similar a la de las bibliotecas, es decir, las y los investigadores interesados podrán revisar los materiales de su interés de manera sistemática y bien clasificada. Esta ponencia tiene por objetivo, exponer la metodología de trabajo, los resultados obtenidos, así como las vías de investigaciones futuras.

Martínez López, Cira [91] see Berube, Eloi

**Martínez Martínez, Xóchitl**

[26]

*Los tableros doble escapularios de las unidades residenciales del Conjunto Monumental de Atzompa*

El tablero doble escapulario es un elemento arquitectónico común en varias regiones de Mesoamérica (Centro de México, área maya y Oaxaca), en este último, se puede apreciar muy claramente en sitios arqueológicos como Monte Albán y Mitla, y recientemente, gracias a los aportes realizados por el Proyecto Arqueológico del Conjunto Monumental de Atzompa (PACMA), se han podido visualizar la presencia de ellos en unidades residenciales, entre las que destacan Casa de los Altares y Casa del Sur. Dichos tableros contenían “discursos” que plasmaban mensajes de linaje, poder y religión, por ende, dichos tableros, presentan una diversidad entre ellos. En esta ponencia se dará un análisis comparativo con base en la evidencia arqueológica y de los procesos de restauración realizados para su estabilidad y preservación del elemento.

**Martínez Martínez, Yazmin (Escuela Nacional de Antropología e Historia)**

[27]

*La producción cerámica en Atzompa*

Atzompa floreció durante un lapso de tiempo marcado por la expansión del estado Zapoteca dirigido por Monte Albán. De acuerdo a la evidencia arqueológica de Atzompa la producción cerámica represento una acción importante dentro de la sociedad atzompeña, donde posiblemente la élite del lugar dirigió esta acción.

Martínez-Pabello, Pavel Ulianov [241] see Menéndez Iglesias, Beatriz

**Martínez-Polanco, María (Universitat Rovira i Virgili, Tarragona, Spain)**

[5]

*Moderator*

[5]

*Discussant*

**Martínez-Polanco, María (Universitat Rovira i Virgili, Tarragona, Spain) and Florent Rivals (Institut Català de Paleoecologia Humana i Evolució Social)**

[218]

*Neotropical Cervids Dietary Traits as a High-Resolution Tool to Understand Past Human Subsistence Strategies*

Cervids in Neotropics played a vital role in precolumbian subsistence strategies. The study of deer remains from archaeological sites, particularly their teeth, as biomarkers offers information about their behavior, environment, feeding preferences, and important events in their life history and by extension to the human groups that could benefit from hunting them. An approach to the diet study is dental wear, in particular mesowear and microwear. They provide complementary data because they present direct evidence of behavior at different time scales. Mesowear results from attrition and abrasion over a long period of time and reflects the average annual diet of an individual. While microwear, due to its high turnover rate, indicates the

type of diet during the last days or weeks before an individual's death. A few years ago, we started to study white-tailed deer (*Odocoileus virginianus*) and brocket deer (*Mazama* sp.) from Panamanian archaeological sites, and we are reporting the potential of these studies. We are expanding our research to the extant animals as control samples or baselines that allow for the interpretation of the archaeological record. The aim of this presentation is to present our recent advances in this research line.

Martínez-Yrizar, Diana [20] see McClung de Tapia, Emily

Martino, Gabriele [87] see Rellini, Ivano

**Martinoia Zamolo, Valentina (Simon Fraser University), Mario Novak (Institute for Anthropological Research), Dragana Rajkovic (Archaeological Museum Osijek, Croatia), Goran Tomac (University of Zagreb, Croatia) and Michael Richards (Simon Fraser University)**  
[29]

*Social Inequality in the Middle-Late Neolithic? Stable Isotope Analysis of the Individuals from Beli Manastir-Popova Zemlja (Slavonia, Croatia)*

Beli Manastir (Slavonia, Croatia) is the largest Middle-Late Neolithic habitation site discovered in Croatia. A total of 37 individuals were found in different burial positions and different areas of this site, and sometimes within burial clusters, with only three individuals buried with abundant grave goods. The burials were, in most cases, placed between or alongside buildings, although some of them could be found in pits or the channel located in the northeastern part of the site. Interestingly, while adult males and females are equally represented, almost half of the total number of inhumations belong to subadults, two-thirds of which were females, which suggests possible sex selection. Some authors (Los 2020; Freilich et al. 2021) suggested that the possible sex selection, the differences in burial positions and locations, the presence of burial clusters, as well as of grave goods are likely an indication of different social statuses within this Neolithic community. We therefore carried out carbon, nitrogen, and sulfur stable isotope analysis to investigate both the long- and short-term diet and mobility of the individuals from Beli Manastir to test whether the hypothesis of social inequality at this site can be corroborated by dietary and mobility isotopic data.

**Martirosyan-Olshansky, Kristine and Alan Farahani (Independent)**

[22]

*Woven Traces: Evidence of Basketry from Masis Blur (Armenia)*

Evidence of woven materials such as baskets, mats, cordage, string, and rope rarely preserve in archaeological contexts, but when these plant-based artifacts do preserve, they provide important insight into the social, technological, and environmental practices involved in the creation and use of such objects. At many Neolithic sites of the Near East evidence of plant-based woven materials has preserved as impressions in clay, charred or desiccated remains, phytoliths, pseudomorphs in corroded metal, and more rarely as calcified remains. To date, in the Southern Caucasus, the Neolithic evidence of basketry has come from negative impressions left on pottery bases. In this paper, we report the first calcified evidence of a coiled basket from Masis Blur, a Neolithic farming community located in the Ararat Plain of Armenia. Review of the evidence of woven materials at Masis Blur suggests that these artifacts played an important role in the daily activities of the inhabitants of Masis Blur.

**Martisius, Naomi (University of Tulsa)**

[214]

*Discussant*

[214]

*Chair*

**Martisius, Naomi (University of Tulsa), Logan Guthrie (University of Tulsa) and Danielle Macdonald (University of Tulsa)**

**[214]**

*Time to Shine: Quantifying the Effect of Burnishing as a Bone Tool Production Method*

Archaeological bone tools acquire a complexly layered series of traces throughout their use-life and after their deposition. Teasing out these traces and understanding their source is essential for any meaningful interpretation of ancient human behavior. Equifinality, the appearance of similar physical characteristics through different means, remains a challenge. In some cases, near-identical materials that should produce similar microwear patterns may have interacted with bone tool surfaces for different purposes. Animal skin could be used to burnish a bone tool during its final production stage, or it could be the material worked by a complete bone tool. In either case, their resulting polishes may be indistinguishable. In this study, we use a confocal microscope and ISO parameters to test microwear development over burnished and non-burnished bone surfaces. Our aim is to determine whether a quantitative signature indicative of material turnover can be detected. We produce a series of small, pointed tools and burnish half with wet tanned leather. We use both types on fresh skin, linden bark, or raffia and analyze them at timed intervals. Finally, we discuss how intentionally burnished surfaces may confound microwear studies as the development of wear atop differently modified surfaces takes on different characteristics.

Martisius, Naomi [171] see Macdonald, Danielle

Martisius, Naomi [214] see Stemp, W. James

Marwick, Ben [152] see Park, Gayoung

Maryon, Sarah [248] see Bennett, Matthew

Mashaka, Husna [2] see James, Sydney

**Mason, Owen (INSTAAR, University of Colorado)**

**[244]**

*Metallurgy, Shamanism, and Ideographic Currency in Bering Strait: Scythian Descent?*

The Late Holocene Bering Strait acted as a filter, marked by intermittent material and technological cross-strait transfers; first of obsidian, ca. 3000 BCE, storage or serving ceramics adopted ca. 1000 BCE, of metallurgic iron ca. 200 CE, rare cast-bronze objects ca. 1150 CE, armor adopted across NW Alaska, with glass beads ca. 1500 CE. Figural and cosmic representation exploded with the transcontinental exchange of walrus or whale bone for Chukotkan reindeer or iron, requisite for ivory engraving. Inequality, evident in differentially elaborate burials, co-occurs with increased whaling, warfare, and transformative shamanism. Mid-twentieth-century researchers attributed circle/dot motifs as joint marking and open-work animal carvings, evidence of cognition acting over unspecified time scales, linked to pan-Eurasian cultic and *Cannabis* use, e.g., Altai Mountain Scythians. A modern diffusionist narrative proposes an ideological dialogue with Turkic horse-riders, entering Siberia between 600 and 1200 CE. Extensive data voids in time and space separate the Scythian/Turkic and Bering Strait societies, complicating processual interpretation. Indirect contacts include a centuries-old bronze north Chinese horse fitting within a twelfth-century house in NW Alaska, and Song dynasty coins on the Sea of Okhotsk. An indigenist perspective favors a derivation from walrus hunters recorded in southern Alaska ca. 3000 BCE.

**Masson, Marilyn (University at Albany SUNY)**

**[83]**

*Discussant*

**Masucci, Maria (Drew University)****[59]***Discussant***Masur, Lindi (University of the South)****[23]***Discussant***[23]***Chair***Masur, Lindi (University of the South)****[51]***Multispecies Entanglements in Great Lakes Agricultural Landscapes: A Case Study from the Late Woodland Arkona Cluster Sites, Ontario*

This paper explores the multispecies entanglements in and along the edges of Western Basin maize fields ca. AD 1000–1300 in southern Ontario, Canada. As these communities became increasingly reliant on agriculture, their construction and management of new field landscapes catalyzed novel social relationships with weedy and wild plants and animals. Using a case study of four archaeological sites including Bingo Village, Van Bree, Figura, and Inland West Pit Location 3, I consider how paleoethnobotany (macrobotanical analysis) and a posthumanist approach can reveal the agency of various plant species. Plants like staghorn sumac (*Rhus typhina*) and bramble (*Rubus* sp.) were quick to colonize field edges and enticed farmers with their bright, tart fruit. Maize attracted foraging deer necessitating new practices like garden hunting. Even after abandonment, through the maintenance of connections to ancestral places, fields remain the setting through which I illustrate the heterarchical nature of these social relationships in the fabric of Western Basin life.

Masur, Lindi [208] see Paskulin, Lindsey

Mataloto, Rui [205] see Lewis, Brandon

Mataloto, Rui [205] see Lorenz, Samantha

**Mathews, Bethany (Antiquity Consulting)****[44]***Washington Women's Homesteading, 1862–1949: Developing a Historic Context of Women's Homesteading Experiences*

The Homestead Act of 1862 enabled feme sole—women who were legally single, widowed, divorced, or deserted—to claim up to 160 acres of land. In Washington State 8.5 million acres (20%) of lands were claimed through the Homestead Act; and although feme sole were a minority of these homesteaders, their homesteading experiences illustrate important themes of American settlement and industry. As a place-based heritage, women's homesteading history presents a rare prospect to study and preserve sites of women's history, including the history of women's rights, the history of suffrage, and queer history. One of the objectives of the Washington Women's Homesteading History project is to explore the spatial and temporal patterns of homesteading across Washington State, to understand women's motivations for homesteading and immigration. This poster presents summary data of women's homesteading history in Washington's Channeled Scablands, Okanogan Highlands, Northern Puget Sound, Southern Puget Sound, Southwest Washington, and Washington Coast regions, and explores future context themes.

**Mathews, Jennifer (Trinity University) and Scott Fedick (University of California, Riverside)****[129]***Gift of the Gods: A Mashup of the History of Mesoamerican Avocados*

The earliest avocados of the Americas were dispersed by extinct megafauna, and later by human populations, including Olmec, Maya, and Aztecs peoples. Prized for their flavor and rich caloric content, avocados were

portrayed on Maya king's tombs, served as the municipal symbol of ancient Mesoamerican cities, as a month in the Maya calendar, and were given as tribute to Maya and Aztec lords. While the Aztecs touted the plant's curative and aphrodisiac properties, during the colonial period, the Spanish used the fruit as food for enslaved people on sugar plantations across their land holdings. In the early nineteenth century, the US Consul based in Campeche, Mexico, brought avocados to Florida, and by the mid-1900s, seedings were transported from Nicaragua and Mexico to California. This paper will discuss the development of the Mesoamerican avocado as a commodity, focusing in particular on the nineteenth and twentieth centuries and the role that amateur horticulturists played in establishing the crop in California.

**Mathiowetz, Michael (Independent scholar)**

[164]

*Plazas, Proxemics, and Ritual Power: The Main Plaza and Ceremonial Precinct at Paquimé, Chihuahua, and Its Place in a Plaza-Pueblo World*

In his seminal article on Andean plazas, Jerry Moore (1996) characterized plazas as spaces that serve as a setting for diverse public interactions, including as arenas that help to structure verbal and nonverbal ritual communication in the context of ritually infused power dynamics. In the Puebloan and Mogollon worlds of the southwestern United States and northern Mexico after AD 1250/1300, the development of plaza-oriented communities (or plaza-pueblos) signified a new way of organizing societies amid tumultuous social and religious transformations following the depopulation of the Four Corners region. Less well understood is how the rise of the major center of Paquimé in the Casas Grandes region of northern Chihuahua contributed to this new use of space across the region as well as the ritualism through which social cohesion took form and power was legitimized. Drawing on Moore's broader insights on plazas, I define a heretofore unrecognized public plaza space at Paquimé, examine the use of space within both the plaza and adjoining architectural units, and situate the use of this space within recent insights on the nature of Casas Grandes and Puebloan sociopolitical organization and power dynamics.

Mathiowetz, Michael [102] see Gutiérrez Ruano, Patricio

Mathiowetz, Michael [102] see Liu, Chin-hsin

Mathu, Patricia [99] see Ranum, Caleb

Mathur, Ryan [166] see Stephens, Jay

**Mathwich, Nicole (San Diego State University)**

[48]

*Embodied Political Ecology in Colonial Livestock: Using Tooth Enamel Serial Sampling to Understand Seasonal Herd Management in Colonial Arizona*

Political ecology examines the relationship between politics and the environment and how that relationship affects ecosystems. While bioarchaeologists have shown the extensive biochemical connections in human remains resulting from political and economic inequalities, less attention has been given to the ways in which animals embody political dynamics. Livestock, in particular, alter their behavior based on human activity and resource use shaped by political policies. In North America, the abundance of livestock and their ties to colonial economies make them particularly attractive to sample. In this multisite study, I examine Spanish colonial political ecology through the embodiment of colonialism in livestock carbon and oxygen isotopic data in the Pimería Alta, today southern Arizona and northern Sonora. I used serial sampling of livestock tooth enamel to examine evidence for seasonal management of livestock species in the Sonoran Desert. My findings identified proxy evidence of how water storage and seasonal grazing management aided the production of livestock for the Spanish colonial economy at mission and presidio sites. The year-round management of herds was central to the colonial political expansion. Isotopic data offer a unique window into the mechanisms that drove herd growth and helped pave the way for colonial expansion into California.

Mathwich, Nicole [82] see Figueroa Beltran, Carlos

Matias, Roxane [239] see Cascalheira, João

**Matos, Ramiro (National Museum of the American Indian, Smithsonian Institution), Jose Alejandro Beltran-Caballero (SETOPANT; Universitat Rovira i Virgili) and Ricardo Mar (Universitat Rovira i Virgili)**  
[61]

*Architecture and Urban Planning of Inka Cusco*

The architectural and urban reconstruction of Cusco as ancient Inka capital has been a central scientific objective in Peruvian archaeology for more than a century. From the pioneering work of Squier and Uhle, continued by Uriel Garcia, Varcárcel, Chávez Ballón, and Rowe, among many others, and continuing with the architectural study of Gasparini-Margolies and Agurto, our project uses the digital technologies developed in the last 20 years to advance the understanding of Inka Cusco as an urban aggregate. From a methodological point of view, the Archaeology of Architecture is the tool that has allowed us to propose a virtual reconstruction of the Inka occupation in the Watanay Valley, from the highlands of Saqsaywaman to Angostura, using all kinds of information: urban archaeology and excavation memories, aerial photographs of 1956, documentation of Inka remains throughout the valley, use of drones, and the most modern 3D modeling software applied to historical architecture. The book we present here gathers the results of this work accomplished between 2010 and 2020. It reflects the current state of interpretation with the available data. Future findings will allow us to revise this visual approach to the urban landscape of the capital of the Tawantinsuyu.

**Matson, R.G. (Univeristy of British Columbia)**

[63]

*Leaving Knowledge Behind: A Feasible Role for Archaeology in the Age of Climate Warming?*

What archaeological knowledge might be significant in our climate emergency? I examine this question using climate “triage.” Optimistically, climate warming restricted to a 2°C increase would allow humans to adapt without destroying the global connections that support the modern economic system. A somewhat greater temperature increase could allow some humans to survive but with a total system and cultural collapse. Pessimistically, our current path would bring in continually rising temperatures resulting in the total destruction of all life. In the first case, archaeological skills are not needed, and nothing can be done in the third. It is the second case, a collapse of our “system” but the survival of humans that I think it is useful to seriously think about “Leaving Knowledge Behind.” I propose we try to transmit to our descendants the knowledge of our history of climate warming and an “encyclopedia” of technology and science as it existed in the early twentieth century. I suggest starting this project by forming two groups, one on what knowledge is to be left and the other on the physical characteristics of the matrix in which it is to be encoded so that it will be extremely durable.

Matsuda, Marie [131] see Simeonoff, Sarah

**Matsumoto, Mallory (University of Texas, Austin)**

[83]

*Discussant*

**Matsumoto, Mallory (University of Texas, Austin)**

[238]

*Emplacing a Classic Maya Ritual: Locating Deity Impersonation through Space and Time*

Michael Coe’s *The Maya Scribe and His World* (1973) and the 1971 Grolier Club exhibition for which it was produced marked the first sustained treatment of scribes and artists in scholarship on Classic Maya civilization. It also highlighted the wealth of information that ceramics and other portable objects offer about

Classic Maya religion. Yet one of the many difficulties of the publication and exhibition's emphasis on looted artifacts was the inability to locate any of them—and, by extension, the insights that they provided—in time or space. This presentation examines how centering provenanced sources can alter our understanding of Classic Maya religion, taking as its case study one of the many hieroglyphic phrases that Coe observed on the exhibition's painted ceramics and that was later deciphered as a reference to deity impersonation. By focusing on archaeologically documented attestations of this practice in Classic Maya text and image, we can appreciate the development of a ritual across time and space and the dynamism of a religious tradition that, despite its many continuities, was constantly changing during its history.

**Matthews, Christopher (Montclair State University), Emma Gilheany (University of Chicago), Megan Hicks (Hunter College, CUNY) and Eric Johnson (Brown University)**

[14]

*Against the Alienability of Archaeology*

Working with marginalized Black and Indigenous communities shines a light on the use of archaeological research to support struggles for heritage, recognition, and well-being in settler colonial states. We highlight archaeology's potential to alienate, whether alienating heritage as "data," land as open to commodification, or meaning as apolitical. Our experience is that archaeology might also work against forces of alienation if used deliberately as part of a community's active process of politics, living, and meaning-making rather than a passive or scientific reflection of their past. In this way, sites and artifacts are constructed through the dialogues that also define communities, both in terms of identity and ongoing politics of land, health, and livelihood. This approach resists the alienability of archaeology to ensure that materials are not distinct from those who define them as significant to their presence today. This is a theoretical and political process in which archaeological meaning-making is tied to pragmatic political ends. We discuss these ideas in a conversation with cultural heritage experts of the Ramapough Lenape Nation Turtle Clan in northern New Jersey about Ramapough heritage, especially in reference to the land and its role in Indigenous sovereignty and nation building.

**Mattson, Hannah (University of New Mexico)**

[206]

*Reexamining the Organization of Ornament Production at Chaco Canyon: Insights from Pueblo Bonito's Lapidary Tool Assemblage*

Several decades ago, the NPS Chaco Project revealed evidence for widespread, small-scale ornament manufacture at small house sites in Chaco Canyon, as well as possible workshop-scale production at two locations. As consumption of finished jewelry items is clearly concentrated at great houses, it was suggested that lapidary production was part of a larger corporate political strategy wherein goods produced in surrounding small houses were used to sustain communal events related to construction activities and ritual performances at great houses. The idea that ornaments, especially those made from turquoise, were primarily made in small house communities but used at great houses has prevailed for the last 20 years. And yet, until now, there hasn't been a systematic attempt to identify and analyze lapidary tools from canyon great houses in order to test this hypothesis. This paper presents the results of my research on lapidary tools from Pueblo Bonito, including implements such as microdrills, lapidary abraders, files, reamers, and tabular saws. Based on this data, I characterize the configuration of on-site ornament manufacture at Pueblo Bonito and discuss its implications for our understanding of the organization of jewelry production in Chaco Canyon.

Mattson, Hannah [43] see Haffner, Jacob

Mauldin, Raymond [198] see Freeman, Jacob

Mauldin, Raymond [198] see Solis, Kristina

Maxwell, Krista [211] see Patton, Katherine

May, Fernando [13] see Pedroza, Berenice

May, Fernando [13] see Sanchez Guerrero, Andres Francisco

**May-Crespo, Jose (Colegio de Michoacán), David Larreina-Garcia (UPV-EHU: University of the Basque Country), Blanca Maldonado (Colegio de Michoacán), Luis Velázquez-Maldonado (Colegio de Michoacán) and Mario Retiz-García (Colegio de Michoacán)**

[13]

*Una perspectiva sobre el empleo del barro cocido en el beneficio del cobre: Caso de Jicalán Viejo, Michoacán*  
Jicalán Viejo, es uno de los sitios prehispánicos donde se han encontrado vestigios de escoria metálica asociada al proceso metalúrgico del cobre. Al igual que las escorias, el barro utilizado en la manufactura de hornos y/o crisoles es otro material de interés. Muestras de barro recolectadas en tres áreas de estudio presentan escoria adherida y minerales alóctonos a la región. Creemos que estos restos formaron parte de los hornos y/o crisoles utilizados para beneficiar el mineral de cobre. El objetivo de este trabajo radica en determinar si las muestras de barro cocido presentan texturas similares o si se trata de pastas preparadas con materiales diferentes. Lo que nos permitirá comprender diferentes aspectos del proceso tecnológico. Para dicho fin, nueve muestras fueron estudiadas por Microscopía Estereoscópica y Electrónica de Barrido para caracterizar las texturas y la composición química multielemental de las facetas materiales. Resultados preliminares de la microscopía: indican que no existió un proceso sistemático en la selección de materiales para manufacturar el barro, de lo cual podemos inferir que existieron fuentes minerales diversas para la obtención de materias primas; entre las cuales consideramos a los restos materiales derivados de los procesos de separación mecánica y limpieza de la mena.

**Mayes, Arion (San Diego State University), Arthur Joyce (University of Colorado, Boulder) and Sarah Barber (University of Central Florida)**

[175]

*Occupational Stress on Oaxaca's Pacific Coast: Bioarchaeological Evidence for Specialized Task Activity at Rio Viejo*  
This paper provides a micro-scale consideration of the broader social processes under way during the Early Classic to the Postclassic periods in the Río Verde drainage basin of Oaxaca, Mexico. Through a detailed bioarchaeological analysis, we examine individuals from Río Viejo for evidence of occupational stress, with an emphasis on select individuals who lived throughout this period, including defined periods of transition. At Río Viejo burials showed osteological changes due to activities exhibiting identifiable signatures of specific task-related activities. Here, we focus on a suite of dental and skeletal changes that, elsewhere, have been attributed to weaving. Additionally, items known to support specific task activities were associated with the individuals described, in varying type and quantity. Taken together, the pathologies and burial features suggest individuals potentially engaged in two distinct forms of fiber-working: spinning and weaving, as well as basketry and/or cord.

Mayes, Arion [102] see Aguayo Ortiz, Elaine

McAdams, Gary [169] see Bethke, Brandi

**McAnany, Patricia (University of North Carolina, Chapel Hill)**

[119]

*Discussant*

**McCafferty, Geoffrey (University of Calgary; University of Kentucky)**

[247]

*Chair*

**McCafferty, Geoffrey (University of Calgary; University of Kentucky)****[247]***Exploring the Roots of Cerro Acozac: New Investigations in Cholula's Ceremonial Center*

Despite being one of ancient Mexico's largest and most enigmatic ceremonial centers, Cholula has often been overlooked in regional interpretations. Research has been conducted intermittently for over 200 years, yet much of it has never been reported. Furthermore, the 2,500-year history of the ceremonial center has created a jigsaw puzzle of dispersed remnants of multiple construction phases from the Great Pyramid, Tlachihualtepetl. This paper will present information from new investigations in the center, specifically from the Cerro Acozac, located southwest of the Great Pyramid. Cerro Acozac exists as an adobe nucleus of about 20 m in height. The research methodology will identify the subsurface edge of the original building and then excavate to expose and document preserved remnants of the facade below the modern ground surface. The architectural style of the Cerro Acozac facade will then be compared with existing architectural details of the Great Pyramid to correlate it with the larger building sequence. Analysis of diagnostic ceramics and archaeometric dating will provide further information on the ceremonial center's chronology. Finally, by incorporating Cerro Acozac into larger interpretations of the ceremonial center, we will add new puzzle pieces to reconstruct Cholula's symbolic landscape.

McCafferty, Geoffrey [246] see McCafferty, Sharisse

**McCafferty, Sharisse (University of Calgary) and Geoffrey McCafferty (University of Calgary; University of Kentucky)****[246]***Weaving the Cosmic House: Chibchan Myth and Nicaraguan Spindle Whorls*

In Bribri myth, the Creator God Sibó commanded Sál, the head of the spider clan, to weave cane and thatch to cover the cosmic house, which was built to encapsulate the world order. The house was supported by a central pole with eight surrounding posts representing each of the major clans. In 20+ years of archaeological research in Pacific Nicaragua, one of the most common themes on decorated spindle whorls dating to the El Rayo and Santa Isabel periods (800–1300 CE) is of “ladders” radiating out from the center hole on the flat bottom of the whorl. We suggest that, with the spindle in the center hole, this would represent the interior roof of the cosmic house. Other whorls were decorated with spider web motifs, and also a plaited twill design widely used to symbolize woven cloth. In other contexts we have suggested cosmological symbolism that decorated spindle whorls. Postclassic Pacific Nicaragua is traditionally interpreted as having been occupied by migrant groups from central Mexico, so it is interesting that symbolic communication on spindle whorls maintained ancestral cosmology of the autochthonous Chibchans, perhaps evidence of gender relations during the ethnogenesis of Chorotega culture.

**McCaig, Haley****[179]***Dating Tukuto Lake Hunting Architecture***[WITHDRAWN]****McCauley, Brea (Simon Fraser University)****[226]***Chair***McCauley, Brea (Simon Fraser University) and Mark Collard (Simon Fraser University)****[226]***Finger Amputation in the Ethnohistoric, Archaeological, and Folktale Records*

To many people in the West, the idea that finger amputation would be carried out for nonmedical reasons is unheard of. However, recent studies suggest that it may have been quite common in the past. The aim of the study presented here was to shed some light on the prevalence of finger amputation customs. To accomplish

this, we examined textual and material evidence of finger amputation practices. We first recorded mentions of finger amputation customs in ethnohistoric texts. A total of 181 ethnohistoric groups were found to have engaged in such customs. Next, we searched for mentions of finger amputation in folktales. We found that folktales associated with 64 groups featured finger amputation. Thereafter, we reviewed six types of material evidence suggestive of finger amputation from 104 sites. The types of evidence we documented included isolated phalanges in contextually significant deposits, finger necklaces, skeletal individuals with missing phalanges and evidence of healed amputations, impressions of hands with amputated fingers, and incomplete hand images. Overall, we identified 245 cultures with either textual or material evidence for finger amputation. The results of our study demonstrate that finger amputation has been a surprisingly common practice globally and for thousands of years.

**McCleary, Alexandra**

[117]

*Discussant*

[117]

*Chair*

**McClung de Tapia, Emily (IIA-UNAM, Mexico)**

[20]

*Discussant*

**McClung de Tapia, Emily (IIA-UNAM, Mexico), Guillermo Acosta-Ochoa (IIA-UNAM, Mexico), Diana Martínez-Yrizar (IIA-UNAM, Mexico), Carmen Cristina Adriano-Morán (IIA-UNAM, Mexico) and Jorge Ezra Cruz-Palma (UNAM)**

[20]

*Lakescapes/Landscapes in the Prehispanic Basin of Mexico: Recent Evidence for Early Subsistence Adaptations*  
Recent studies of both macrobotanical and microbotanical remains associated with early populations in the Basin of Mexico provide broader evidence for plant use and contribute to understanding of the range of subsistence components available to these communities. From a methodological perspective, the complementary analyses of macrobotanical remains together with phytoliths and starch grains from such contexts provides a constructive approach to understanding both adaptations to past landscape as well as foodways. Two case studies are considered: Pre-ceramic Middle Holocene evidence from San Gregorio Atlapulco, a former *tlatel* in Lake Xochimilco (Southern Basin), and Early–Middle Formative period indicators from Altica, a piedmont community in the southern Teotihuacan Valley (Northern Basin). Although substantially different with respect to environmental characteristics, economic organization, and activities related to food production are concerned, domestic contexts from both sites provide evidence for more diverse procurement and production of subsistence resources than previously reported from Mesoamerican communities within these time frames.

**McClure, Richard, Eugene Hunn (University of Washington) and Joana Jansen (University of Oregon)**

[185]

*Archival Oral Histories, Intellectual Property, and the Indigenous Community: The Legacy of Mary Kiona, “Grand Matriarch” of the Upper Cowlitz*

Archival collections of Native language oral histories are widely scattered among universities, museums, and tribal repositories throughout the Pacific Northwest region. Many of these oral histories are an important primary source of information relative to traditional Indigenous land-use practices, in turn critical to an understanding of the archaeological record. Audiotape interviews conducted in 1964–1965 with Taytnapam (Upper Cowlitz) elder Mary Kiona (1869–1970) provide a case study in process, the importance of legacy interview material, the challenges of translation and transcription, intellectual property concerns, and the rewards of collaboration with descendant communities and indigenous scholars. Traditional knowledge

contained within the original Taytnapam Ichishkiin (Sahaptin) language narratives includes information relative to the identification and management of cultural resources over a broad landscape, including federal lands managed by the US Forest Service.

**McCool, Weston (University of Utah), Brian Coddling (University of Utah) and Kenneth Vernon (University of Colorado, Boulder)**

[97]

*Leveraging Behavioral Ecology to Understand the Relationship between Resource Availability and Human Violence*

Violence is a pervasive feature of human prehistory, and its traces can be found throughout the archaeological record. Collective violence has important effects on individual survival and is thought to play a critical role in the evolution of complex social systems. However, participation in coalitionary violence elicits a collective action problem and entails high costs. As such, anthropologists have devoted considerable attention to what adaptive payoffs explain the evolution of coalitionary violence. Despite gains in this field, researchers struggle to understand the socioecological conditions that promote violence. In this talk, we argue that behavioral ecology (BE) offers key insights into the emergence and persistence of collective violence and relate changes in resource conditions to variation in rates of violence. I argue that the current evidence suggests that the adaptive payoffs for violence are increasingly motivated by resource acquisition as societies transition from foraging, to farming, to complex states. Rather than assume this relationship indicates starvation-induced conflict, we use logic from BE to suggest that resources become paramount because they can be owned, accumulated, and ultimately translated into fitness benefits. I demonstrate this relationship using a cross-cultural archaeological and ethnographic database and contemporary homicide data from the United States.

McCool, Weston [118] see Radde, Hugh

McCool, Weston [97] see Vernon, Kenneth

**McCormick Alcorta, David Rafael (Yale University Mohegan Tribe)**

[21]

*Society's Cutting-Edge Crafters: Lithic Commodity Production at Cotzumalhuapa*

Lithic artisans were critical to society throughout the Americas prior to the introduction of iron by Europeans. On the Pacific Coast of Guatemala, where no local sources of chipped-stone imported obsidian was available, obsidian was used to meet social demand for cutting edges. Throughout time this demand was met by a mixture of importing finished tools and raw material which was manipulated by local artisans. During the Late-Classic Cotzumalhuapa imported vast amounts of obsidian which was converted into a variety of products. Primarily, obsidian was made into prismatic blades, the ubiquitous cutting tool of Mesoamerican society from the Middle Formative until after the Spanish Conquest. Crafters at Cotzumalhuapa also created a large amount of weaponry in the form of projectile or spear points. This paper discusses the technological typology of tools made at Cotzumalhuapa from data gathered at large five large obsidian dumps located throughout the site.

**McCoy, Mark (Southern Methodist University)**

[142]

*Wealth Inequality in Polynesia: A Comparison of Evidence from the Hawaiian Islands, Rapa Nui (Easter Island), and Aotearoa (New Zealand), AD 1000–1800*

Polynesia has been largely overlooked in previous archaeological assessments of levels of wealth difference despite the pivotal role that research in the region has played in advancing our understanding of inequality in human societies. The Global Dynamics of Wealth Inequality (GINI) Project will redress this gap by systematically evaluating domestic architecture from the Hawaiian Islands, Rapa Nui (Easter Island), and Aotearoa (New Zealand). This update will center on three basic questions: What data appropriate for the project exist for these islands? How can we overcome the challenge of drawing out metrics of wealth that

are both useful for cross-cultural comparison but also reflect what we know about wealth in Polynesia from ethnography and ethnohistory? What does the work to-date suggest about wealth inequality in Polynesia? This final question will be discussed relative to how these societies have traditionally been classified by anthropologists as exemplars of different kinds of complex, hierarchical societies.

**McCoy, Timothy (Smithsonian Institution)**

**[219]**

*The Use of Iron Meteorites for Hopewell Beads*

Iron meteorites are among the most exotic raw materials used for Hopewell ceremonial objects. The sourcing of these meteorites via chemical comparison to known meteorites has implications for acquisition and exchange. Some large meteorites (e.g., Brenham, KS; 4 tons in hundreds of masses) may have been recovered by expeditions, whereas iron from smaller showers (Anoka, MN; two known masses of several kg) likely moved through interaction between Hopewell centers. Complementary structural studies, primarily through comparative metallography of the source meteorites and artifacts, reveal manufacturing methods. Iron meteorite beads were manufactured by repeated cycles of cold working and annealing to sheet form followed by rolling into beads. Replication experiments using lithics produced metallographic textures, notably subgrain sizes in kamacite, similar to Hopewell beads. Experiments using modern steel tools produced substantially larger subgrains, reflecting overly efficient deformation. Replication experiments in, e.g., copper, using modern tools may have similar issues. How individual pieces for beads were separated from a larger mass remains uncertain. Replication experiments in copper suggest scribing, bending, and fatigue cracking, but used modern tools. Experiments producing multiple beads from a single mass using period techniques and tools are underway.

McCray, Brian [19] see Bria, Rebecca

McCuaig, Julia [29] see González Gómez de Agüero, Adrián

McCutcheon, Patrick [70] see Lubinski, Patrick

**McDaniel, Sarah and Michelle Stegner**

**[160]**

*75,000 troops, 10,000 square miles, 3 months, 8 battles . . . and Only a Handful of Archaeological Sites? Reassessing Archaeology of the World War II Oregon Maneuver Training Exercise*

**[WITHDRAWN]**

**McDonald, Holli, Lacy Hazelwood (University of Montana) and Meradeth Snow (University of Montana)**

**[45]**

*Children of Casas Grandes: A Molecular Examination of Subadults at Convento and Paquimé*

Bioarchaeological research has played a significant role in understanding the Casas Grandes region of Northwest Mexico. Excavations at the archaeological sites of Convento and Paquimé recovered at least 652 burials dating to AD 700–1450, providing a robust skeletal population for investigations, including research on population demographics, patterns of violence, and social stratification. While there is extensive literature on these individuals, research focusing solely on subadults is nonexistent. This study employs genetic and isotopic analyses on subadult remains from both Convento and Paquimé to provide estimations of biological sex and migration status. Permission for this work has been granted by the Instituto Nacional de Antropología y Historia (INAH) of Mexico, and all work has been completed with integration with the current residents of the region. The resulting information is used to address key issues of mobility and social organization. The integration of research of subadults with those of adults is necessary for a better

understanding of past societies, and aids particularly in understanding the prehispanic Casas Grandes perception of childhood, violence, and social stratification.

**McDonough, Katelyn (University of Oregon)**

[107]

*Discussant*

[130]

*Chair*

**McDonough, Katelyn (University of Oregon) and Madeline Mackie (Weber State University)**

[130]

*Cooking across the Continent: Overview of Pleistocene Archaeobotanical Remains and Exploration of Biases Affecting Botanical Visibility*

Understanding how Indigenous communities used plants during the Pleistocene is fundamental to addressing questions about long-term ecological relationships, dietary practices, and adaptive strategies. Pleistocene plant use has not been a primary topic in North American archaeology, due in part to the sparse material evidence. Recently recovered archaeobotanical assemblages from across the continent offer new opportunities to consider plant foods and to reflect on variables that are biasing our view of Pleistocene food economies. This paper reviews the current evidence of dietary plant remains and investigates variables that influence the probability of botanical discovery at Pleistocene sites. Primary variables include taphonomy, site type, sampling strategies, and processing methods. This review will help us better assess long-standing ideas about Pleistocene lifeways and proposed changes over the following millennia.

McDonough, Katelyn [21] see Saper, Shelby

**McDonough, Kristina (University of Idaho)**

[7]

*The Economies of Twentieth-Century Blacksmith Shops in Idaho*

In March 2022, the site of an early twentieth-century blacksmith shop on my family's 90-acre sheep ranch in Montour Valley of southwestern Idaho was excavated due to dilapidation and subsequent collapse of the structure. In the early twentieth century, the valley was the site of intensive agriculture and ranching, and the establishment of the railroad in the nearby town of Montour led to a bustling industrial hub. Through the investigation of recovered historical artifacts, I will explore the role of small, individually operated blacksmith shops in rural Idaho, which have little to no in-depth research. My personal connection to the site offers an idiomatic approach to the archaeological study of blacksmith shops. The contribution of this paper to the history of Idaho will provide a richer understanding of the role of smaller, domestic blacksmiths.

McElrone, Devlin [183] see Powis, Terry

**McElroy, Emily**

[105]

*In the Footsteps of the Muses: Writing for Archaeogaming Educational Modules (AEM)*

Video games are no longer silly pastimes where you press "B" to jump. As video games have become a larger part of children's life, so too have video games become a larger part of academia. Video games are now being designed to display academic and historical subjects such as Ancient Rome, Ancient Egypt, and the Viking Diaspora. Yet there has been pushback from implementing video games in school. Research has shown that teachers are resistant to using video games in the classroom for several reasons, including fear of parental objection, lack of knowledge about resources, or simply viewing video games as a childish time waste. The process of writing for the AEMs is designed to help counter these misconceptions about archaeogaming. The writing must strike a balance between historical accuracy and approachability. The methods of creating each module include research, consultation with fellow scholars, assessing what imagery a video game can offer,

writing the module based on these factors, and then editing the final script to make sure each section is the best it can be. In writing for the modules, SASA has produced modules that stand the test of review and that keep students engaged.

**McFarland, Jeremy (University of Nevada, Reno)**

[63]

*A Chronological Multisite Analysis of Shellfish Gathering Strategies in the King Range National Conservation Area, Northwest California*

The King Range National Conservation Area (KRNCA), located in southern Humboldt County, California, has been of particular interest to archaeologists since the 1970s. Early archaeological investigations in the KRNCA were crucial for developing regional North Coast chronologies and have yielded some of the oldest coastal sites north of San Francisco Bay. Although these investigations have provided a foundation of initial site descriptions and preliminary shellfish analyses, there is room for further analyses by compiling shellfish data from the individual investigations and analyzing variable shellfish gathering strategies through time (~3,000 years–present). A temporal, multisite analytical approach has the potential to help understand long-term changes in shellfish gathering strategies as they may relate to the effects of climate change on coastal resource abundance or Indigenous management practices and adaptive strategies. In this study, I compile existing radiocarbon dates and shellfish remains from coastal sites in the KRNCA to assess diachronic trends in shellfish use through time. The results of this study may indicate a complex pattern of shellfish gathering strategies consistent with a geographically and culturally diverse region.

McFeaters, Andrew [225] see Shanks, Jeffrey

**McGill, Dru (North Carolina State University)**

[14]

*Chair*

[39]

*Discussant*

**McGill, Dru (North Carolina State University) and Katherine Chiou (University of Alabama)**

[124]

*What's Up with the Ethics Bowl? Introducing a New Ethics and Responsible Research Project for Archaeology*

In this poster, the authors introduce a three-year NSF-funded project to advance knowledge on the pervasiveness and effectiveness of ethics training interventions in archaeology and other STEM fields. Specifically, the project will examine the organization, implementation, and long-term results of competitive ethics case study-based debates, such as the SAA Ethics Bowl. The poster will outline the project goals and methodologies, provide information on how archaeologists can participate, and include participatory elements including asking conference attendees to describe what they see as archaeology's most pressing ethical debates, and to discuss what ethics training they received during their professional education.

**McGovern, Thomas**

[173]

*Chair*

McGowen, Michael [71] see Loiselle, Hope

**McGuire, Randall (Binghamton University)**

[119]

*Moderator*

**McInteer, Jason (USDA Forest Service)****[194]***Discussant*

McKechnie, Iain [245] see Dierks, Katie

**McKee, Brian (University of Arizona), Katherine Cera, Serafin Gomez Luna and Fernando Zuleta****[44]***La Iglesia de Osicala: A Church on the Northeastern Frontier of Colonial El Salvador*

The Morazán Archaeological Inventory Project documented the colonial church of Osicala in 2015. Osicala was the northernmost Catholic parish in eastern El Salvador during the colonial period, and included 11 towns and a wide swath of territory extending north to Honduras. The town of Osicala, including its church, was abandoned between 1877 and 1881; both the town and the church were relocated about 1 km south. People have reoccupied the area of the abandoned church and town in the decades since the end of El Salvador's civil war (1979–1992). Cultural and non-cultural formation processes have destroyed much of the church. Recent settlers recycled construction materials to use in their own houses and destroyed the unstable bell tower because of the risk it posed to children playing in it. However, substantial portions of the western wall, including the principal entrance, are preserved. We document the form of the church and the nature of its construction. Contemporaneous Salvadoran colonial churches in a better state of preservation provide models to understand the remains. Colonial church and civic documents offer a context for the church, parish, and town.

McKeown, Ashley [95] see Ahlman, Todd

**McKillop, Heather (Louisiana State University)****[129]***Identifying Salt Cakes as Commodities in the Classic Maya Marketplace Economy*

Production of salt cakes for trade in modern and historic communities provides three testable hypotheses for identifying ancient Maya trade of this commodity. If salt cakes were transported in pots as in the Philippines, briquetage would be found at consumer communities, as suggested for Aventura, Belize. Only non-vessel briquetage, including supports and oven furniture would be at the salt kitchen. In contrast, if brine-boiling pots were broken and discarded at the salt kitchens, with salt cakes traded to regional marketplaces, as at the Maya highland salt works at Sacapulas and San Mateo Ixtatan, there would be no ceramic evidence of salt trade at marketplaces. If the salt cakes were wrapped in leaves as depicted on the Calakmul mural of a salt vendor, organic residue might remain. If wet salt was removed from brine-boiling pots and placed into forms, as at Ixtapa and Sacapulas, the size and number of the brine-boiling pots would not reflect the size and number of the units of hardened salt. With brine-boiling pottery and oven furniture comprising 90%–98% of the pottery at the Paynes Creek Salt Works, the model of hardened salt cakes removed from the brine-boiling vessels is supported.

McKinney, Holly [15] see Potter, Ben

McKinney, Holly [15] see Yeske, Kate

McKinney, Meagan [227] see Angeloff, Nick

McKinny, Chris [191] see Ross, Jon

**McLaren, Duncan (Hakai Institute)**

[89]

*Late Pleistocene and Early Holocene Stone Tool Technologies from the Pacific Coast of Canada*

Archaeological investigations into late Pleistocene and early Holocene archaeological components on the Pacific coast of Canada have uncovered several different approaches to chipped stone manufacturing. The earliest known assemblages are associated with calibrated radiocarbon ages between 14,000 and 13,500 years ago and contain examples of core and flake tools. Between 13,000 and 12,500 years ago the first well-documented project point types are known. Core and flake assemblages tend to be dominated by discoidal and Levallois-like technological approaches. The types of projectile points found across the region range from stemmed to those that are more foliate in shape. Caches of formed tools have also been identified giving insights into the composition of tool kits and the transportation of raw materials. Microblade technology appears in coastal areas after 10,000 calendar years ago. This paper will review our knowledge of stone tool technologies dating to the Pleistocene/Holocene transition in near-coastal areas and will present on recent finds from a number of sites.

McLaren, Whitney [15] see Esdale, Julie

**McLeester, Madeleine (Dartmouth College), Jesse Casana (Dartmouth College), Carolin Ferwerda (Dartmouth College), Alison Anastasio (University of Chicago) and Jonathan Alperstein (Dartmouth College)**

[111]

*Multiscalar Investigations of Ridged Fields at the Menominee Reservation, WI*

Raised Indigenous agricultural features were once the most common earthworks in the American Midwest. Today, they are among the rarest. The Menominee Reservation in northern Wisconsin contains the densest concentration of ancient agricultural features in the American Midwest, providing a unique opportunity to study these now rare features and examine how past Menominee communities successfully cultivated corn at these colder, high latitudes. This project employs an array of techniques to locate, map, analyze, and establish the long-term impacts of these landscapes. Here, we present lidar data collected from select archaeological agricultural sites at the Menominee Reservation alongside stable isotopic signatures of garden beds. Looking to the long-term impacts of these agricultural landscapes, we conducted contemporary vegetation surveys alongside our archaeological work. Together, these multiscalar approaches provide new, key insights on Indigenous corn agricultural practices in colder environments and their lasting legacies.

McLeester, Madeleine [177] see Alperstein, Jonathan

McLeester, Madeleine [55] see Casana, Jesse

McLeester, Madeleine [140] see Schurr, Mark

**McLeod, Charles (US Forest Service [Retired])**

[18]

*Secrets of Two Historic Montana Homesteads*

In 1979 the Lolo National Forest purchased 320 acres in the Upper Rock Creek drainage, Granite County, Western Montana. The 320 acres incorporated two patented homestead claims (Hogback Homestead and Morgan-Case Homestead), both with standing architecture. In 1990 the Missoula Ranger District began rehabilitation of the Hogback Homestead to preserve and interpret its historic values. However, the homestead era improvements overlay a significant precontact archaeological site (dating from 10,000 BP through the historic period), which required completion of an extensive data-recovery effort. Personnel recovered nearly 4,000 artifacts prior to earth-moving activities necessary to restore the homestead dwelling

and improve access to the site. The Morgan-Case Homestead was settled in the late 1880s by an African American woman originally from Maryland. In 2000 the Missoula Ranger District began rehabilitating the site, with the intention of preserving and interpreting its history. Six years into the project, the Region I Preservation Team leader found a cache of artifacts associated with Hoodoo healing, which originated in West Africa. Similar artifact caches have been found in the Southeast and as far west as Texas, but prior to the discovery at Morgan-Case, none had been found in the northern tier of the United States.

**McMahon, Augusta (University of Chicago)**

[213]

*Early Mesopotamian Urbanism and Social Stress: Violent Conflict at Fourth Millennium BCE Tell Brak, NE Syria*  
Past urbanism is usually reconstructed as a positive development, with cities presented as locations of economic efficiency, technological innovation, and productive social networks. But past cities also presented challenges, as sources of disease, inequalities, and high mortality. At Tell Brak (NE Syria/northern Mesopotamia), urban growth in the early fourth millennium BCE coincided with several episodes of extreme social stress, generating violent conflict and resulting in mass graves of up to several hundred dead individuals. These mass graves mixed the bodies of the dead and showed evidence of other corpse abuses, in targeted ways that denied their personal identities. The creation of a burial mound over the graves commemorated the battle and served as a strong physical and ideological signal of the new power in the urban landscape.

**McNeil, Cameron (Lehman College, CUNY)**

[52]

*Chair*

[186]

*Discussant*

**McNeil, Cameron (Lehman College, CUNY), Edy Barrios (CUDEP/USAC), Mauricio Díaz García (Graduate Center, CUNY), Agapito Carballo (PARAC) and Samuel Pinto (PARAC)**

[52]

*Pib Naah y la Partería: Birth Rituals and Midwifery at Río Amarillo, Copan, Honduras*

This paper explores evidence of women's ritual practice at Río Amarillo, a site located 20 km from the Classic period center of Copan. While the ritual activities of royal women are largely hidden from view in Copan's Acropolis, excavations at the site of Río Amarillo and in the groups surrounding it uncovered two contexts that were particularly revealing, a shrine and a group containing a *pib naah* (sweat bath). The shrine in Río Amarillo's East Group held more spindle whorls than found elsewhere at the site, a pattern also noted at Cerén in El Salvador, possibly indicating they were offerings. Group 29, the "Midwife's Neighborhood," includes the *pib naah* and served as a locus for female ritual activities celebrating and promoting fecundity. A high concentration of manos and metates in this area suggests that women ground maize while awaiting the arrival of new members of the community. The presence of a goddess figurine holding a child (or spirit being), and sculpted toad imagery mirrors ritual deposits found in other Maya sweatbaths.

McNeil, Cameron [85] see Barrios, Edy

McNeil, Cameron [191] see Díaz García, Mauricio

**McNeill, Patricia (University of California, Davis), Bryna Hull (University of California, Davis) and Teresa Steele (University of California, Davis)**

[214]

*Using Modern Ostrich Eggshell to Establish a Color Alteration Index and Determine the Physical and Chemical Effects of Heat Exposure*

Ostrich eggshell (OES) is common in archaeological sites throughout Africa and Asia and is often recovered with evidence of pre- and postdepositional burning. The physical nature of OES protects some isotopic data

that remain locked away in the crystalline shell matrix, allowing researchers to use these data thousands of years later to analyze mobility patterns, determine evidence of trade, and reconstruct paleoclimate. This project was designed to study the physical and chemical effects of heat exposure on OES to assist in understanding how exposure to heat effects the color as well as the isotopic values in both the mineral and organic portions of OES. To do this, we heated five modern ostrich eggs to 500°C in 50° increments and studied the carbon and nitrogen isotopes in the organic portion as well as the carbon and oxygen isotopes in the mineral portion in both the heated and unheated samples to record any differences in color and isotopic values. Preliminary results indicate significant deterioration of the isotopic signatures contained in the organic portion of shell heated to temperatures above 300°C, so a better understanding of this system is imperative to support successful sample selection that will generate more precise data.

McNeill, Patricia [169] see Watson, Sara

**McPherron, Shannon (MPI)**

[212]

*Chair*

**McPherron, Shannon (MPI)**

[212]

*Harold Dibble: Skepticism, Null models, and  $p < 0.05$*

Harold Dibble thought that one of the most important attributes of a good scientist is deep skepticism. He brought a persistent skepticism to every aspect of his scientific curiosity whether it was in his own field of prehistory or elsewhere. His skepticism also made him argumentative, a trait he relished more than many of his colleagues. Most often these disagreements were rooted in the null model or what initial conditions we can attribute to past hominin behavior. In his view, one of the primary responsibilities of prehistorians working on the origins of human behavior was to carefully guard against including particular behaviors into the suite of past hominin behaviors too quickly (meaning also too early in time). Thus his null models were viewed as drastically underappreciating the range or state of past hominin behavioral repertoires. This starting point combined with his need to demonstrate the contrary at  $p < 0.05$  type levels of confidence on what is a nearly always flawed archaeological record meant that Harold's views on topics like Neanderthal use of fire, burials, symbolism, etc., remained conservative. This presentation will elaborate these points with examples from his life and career.

McPherron, Shannon [168] see Dogandzic, Tamara

McPherron, Shannon [168] see Li, Li

**McPherson, Gabrielle (Oregon State University)**

[145]

*Analysis of Western Stemmed Tradition Stone Tool Patterns and Faunal Remains from Pit Feature 95 at the Cooper's Ferry Site (10IH73), Idaho*

Investigations at the Cooper's Ferry site (10IH73) reveal unique insights about the Western Stemmed Tradition (WST). Previous studies at the site presented information on WST pit cache features; here specifically, I present a study of Feature 95 (F95), which provides an archaeological snapshot of site occupation at  $\sim 9679 \pm 33$  BP (11,190–11,093 cal BP). Feature 95 contains multiple WST points, modified flakes, debitage, and fragmented faunal remains, including carnivore teeth and a canid mandible. Results of analyses presented here reveal details about the morphometry of stemmed points, the technological patterns revealed in discarded debitage, and economic patterns reflected in the disposal of animal remains. I will also present a study of the canid mandible and give a preliminary view on whether it represents a domesticated dog. I will compare F95 with other WST features from Cooper's Ferry and analyze how the data here can inform us about the lifeways of early Holocene WST people in the Columbia River Plateau.

**McSherry, Christina****[144]***Discussant***Mead, Nicholas (Maritime Archaeological Society)****[35]***Terrestrial Survey for the Beeswax Wreck of the Oregon Coast*

The recent discovery and subsequent recovery of ship timbers believed to belong to the Manila galleon *Santo Cristo de Burgos* present new opportunities for archaeological survey on the Oregon coastline. The Maritime Archaeological Society, along with Oregon State Parks, has plans to conduct survey and phase one testing in areas surrounding the timber recovery site to retrieve more data on the timbers and the site formation processes. The Nehalem Valley Historical Society (Giesecke 2007) has published research on the beeswax wreck galleon, citing local awareness of timbers believed to comprise the galleon dating to as recently as the 1920s and 1930s in proximity to extant features that remain in use. Further terrestrial survey in these key target locations may assist in confirming the identity of the shipwreck and increase our knowledge of the diffusion of the ship's cargo. While the Maritime Archaeological Society is simultaneously conducting remote underwater survey operations and intertidal zone investigation efforts, we believe that ethnography, oral history, and local knowledge present equally important opportunities to retrieve more information on this significant shipwreck whose cargo has inundated the beaches of northwestern Oregon.

Meadow, Richard [71] see Millien, Sebastian

**Means, Bernard (Virtual Curation Laboratory)****[18]***Beyond the Borders: Using 3D Public Archaeology to Democratize the Past at US National Parks*

National Parks in the United States contain within their borders a natural and cultural heritage not only significant to all the nation's inhabitants but also hold importance on a global scale. Although interaction with this heritage within a national park is intended to be direct and physical, this is not always feasible for potential visitors, owing to various limiting factors, including inadequate accommodations for all individuals and economic restrictions, such as costs of travel or lodging. Most recently, most national parks had restricted access or were closed during the ongoing COVID pandemic. To address some issues, the National Park Service teamed with the Virtual Curation Laboratory at Virginia Commonwealth University to 3D scan artifacts, fossils, and historic objects of great interpretive value that could be readily integrated into educational lessons drawing on 3D models and accurate replicas made with 3D printers. These digitally archived and freely downloadable 3D models include historical objects owned by Frederick Douglass and Maggie Walker, Ben Franklin's mastodon tooth, artifacts from Philadelphia dating to the time the US Constitution was written, bullets and bayonets from Petersburg National Battlefield, and coins from late eighteenth- and early nineteenth-century Spanish shipwrecks off the shores of Assateague Island.

Medhat, AbdelRahman [126] see Silverstein, Jay

**Medina, Isabella (Universidad Autónoma de Yucatán), Inés Zazueta (Universidad Autónoma de Yucatán) and Vera Tiesler (Universidad Autónoma de Yucatán)****[204]***Bones and Ritual among the Ancient Maya of Calakmul and Champotón, Campeche: Celebrating the Legacy of Dr. William Folan (1931–2022)*

The Mayanist community recalls a close colleague and tireless promoter of Maya archaeology, Dr. Folan. The Bioarchaeology Laboratory of the Autonomous University of Yucatan remembers him with great affection and a

deep appreciation of a remarkable person, scholar, and student mentor. He ably led the archaeological explorations at the Maya sites of Calakmul and Champotón, Campeche, where a string of extraordinary findings and persistent interdisciplinary inquiries have enabled new interpretations of dynasties, climatic impact, and also ritualized treatments of the human body. These discussions and many more began in the nineties, at the legendary Maya Culture Meetings, an annual conference that Dr. Folan turned into a must-attend academic venue. In this contribution we present the most recent interpretation on physically embodied ritualized violence and public display at Champotón and Calakmul. Put into regional context, their joint reconstruction warrants novel insights on the underlying ritual sequences and their potential religious advocations.

Meek, Andrew [210] see Nash-Pye, Charlotte

**Meier, Jacqueline (University of North Florida), Thalia Lynn (University of North Florida) and Kim Shelton (University of California, Berkeley)**

[128]

*From Agamemnon to the Animals: Zooarchaeological Research on Human-Animal Boundaries at Mycenae, Greece*

At the Late Bronze Age site Mycenae in Greece, animals have long been understood mainly in terms of records preserved on clay tablets and sealings, artistic depictions, and later references in Homeric epic echoed by Schliemann. The archaeological remains of animals record a more detailed record of complex human-animal interactions across different Mycenaean social realms, including extra-palatial contexts. Recent zooarchaeological research elucidated facets of livestock herding practices, the treatment of animal bodies, and refuse management at Mycenae. Here, we use this faunal evidence to expand the current picture of animal agents involved in Mycenaean society. We focus on the recent results of the contextual taphonomic and demographic analysis of faunal remains recovered from Petsas House, a residence used for ceramic production and storage in Mycenae's settlement. We build on previous analysis of a sample recovered from a well feature dating to the LH III A2 period (fourteenth century BCE) and highlight how new evidence of stock keeping and intrasite variation in populations relates to the wider regional picture of the animal economy. Ultimately, our findings challenge current views of human-animal boundaries at Mycenae and work to better reveal the animal agents of an industrial-use household.

**Meierhoff, James (University of Illinois, Chicago)**

[133]

*Tikal's Missing Carved Wooden Lintel*

In 1879, the Guatemalan Secretary of Agriculture Salvador Valenzuela saw the damage to the temples of Tikal by the removal of many of its carved wooden lintels, and observed that "The beams of the doors of these towers, which form the lintels of the doors, were pulled out by a foreign doctor [Gustave Bernoulli] the year before last, and that which time and nature could not destroy with the great trees that had grown there this man has done." Astonishingly, Valenzuela's next course of action was to perform the same deed that he was condemning Bernoulli for, "As that doctor of whom I spoke had done, I pulled out the lintels of the principal door of this building, saving the carved part and removing with an axe the rest of the beam, to bring them to our museum." This paper challenges earlier assumptions that all the outer lintels of Tikal's Great Temples were plain and presents evidence that Valenzuela removed hitherto unknown carved wooden beams from Temple III Lintel I of Tikal. The paper concludes following the historical record attempting to track unknown carved wooden beams from Tikal in the late nineteenth and early twentieth centuries.

Meinekat, Sarah [74] see Milton, Emily

Méjean, Pauline [3] see Cardoso, Jessica

Méjean, Pauline [252] see Jaouen, Klervia

**Mejía Ramón, Andrés (Okinawa Institute of Science and Technology), Jessica Munson (Lycoming College), Jill Onken (University of Arizona) and Lorena Paiz (Proyecto Arqueológico Altar de Sacrificios)**

[165]

*Let the Crops Speak for Themselves: How to Avoid Imposing Agroecological Assumptions at Altar de Sacrificios*  
Any sizable population must be sustained by an adequate food supply. As such, estimates for high population densities in the Maya Lowlands must be met with an equal or greater productive capacity. The “Provisioning Ancient Maya Cities” symposium seeks to understand this on a site-by-site basis by relying on the method developed at El Pilar. In this paper, we report the same metric for Altar de Sacrificios in the Upper Usumacinta Confluence Zone. We compare it with a model that recognizes individual Maya people’s ability to adapt to local challenges, and that environmental variability at various scales differentially affects productive capacity. Specifically, we train a Random Forest model with productive capacities for the various indigenous seed and tree crops listed in the 1960 Mexican Agricultural Census, controlling for irrigation and fertilizer use along with local climatic, topographic, and edaphic factors. Paleoenvironmental reconstructions of regional-level climate during the Formative through Late Classic periods are then used to predict the maximum ideal productive capacity. We finally use local population estimates and the “Ibmech” package for R to account for labor capacity and its spatial distribution. This allows for a reasonable maximum estimate based on the closest known case studies to archaeological observations.

Mejía Ramón, Andrés [142] see Munson, Jessica

Mejía Ramón, Andrés [123] see Onken, Jill

**Melgar, Emiliano (Museo del Templo Mayor-INAH)**

[83]

*Discussant*

Meling, Juliette [75] see Clow, Zachery

**Melton, J. Anne (University of Minnesota), Emily Liu (Stanford University), Jeff Calder (University of Minnesota) and Katrina Yezzi-Woodley (University of Minnesota)**

[41]

*You’ve Got Tools: Evaluating Comparability Among 3D Lithic Angle Measurement Tools*

It is widely accepted that angle measurements taken on lithic artifacts form a crucial part of lithic analysis. Thanks to advances in 3D-scanning technology, researchers now have virtual angle-measuring options. However, since these new virtual tools were created independently and thus are utilizing their own “suite” of algorithms dependent on the creators’ professional opinions, goals, and expectations, it was still uncertain whether the variation between these algorithms is substantial enough to affect comparability. This poster reports the results from evaluating the comparability of the three most common virtual angle measurement tools used presently in lithic analyses: the Virtual Goniometer (Yezzi-Woodley et al. 2021), Lithics3D (Pop 2019), and Artifact3-D (Valletta et al. 2020; Grosman et al. 2022). After replicating angle measurements (edge angles and exterior platform angles) on a sample of 150 lithic objects using the three virtual tools and the manual goniometer, analyses were conducted to understand the degree of variability present among measurements as byproducts of the tools themselves. The goal of these comparisons is not to determine whether one virtual tool is more accurate than another, but rather to understand the inherent tool variability, which may inadvertently be interpreted as being behaviorally relevant.

Melton, J. Anne [240] see Pajovic, Goran

Melton, J. Anne [240] see Porter, Samantha

Mendes Cardoso, Jéssica [252] see Jaouen, Klervia

**Méndez, César (Centro de Investigación en Ecosistemas de la Patagonia) and Amalia Nuevo-Delaunay (Centro de Investigación en Ecosistemas de la Patagonia)**

[148]

*Tackling the Early Holocene Record in Patagonia*

The early Holocene archaeological record in Patagonia has always been elusive. It is often recorded as layers within multicomponent cave sites where archaeological and natural materials accumulate. However ordered the layering, careful the excavation techniques, or large the quantity of radiocarbon dates, such sites are complex to interpret due to site redundancy, human/carnivore alternation, and the contribution of multiple sources of sediments, among others. Here we report a single-component early Holocene site around an erratic in a fluvial/glacial valley east of the Northern Ice Field of Central West Patagonia. The Doble Lili rock shelter features occupations spanning 9000 to 8300 cal BP in a continuous deposit extending beneath the rock, as well as open to the air. Lithic material includes both local and exotic (obsidian) tools and is diversified enough to suggest multiple activities consistent with a moderate-span occupation. Faunal material is infrequent, but indicates primarily the consumption of guanaco, the largest extant mammal in the region. This new site features no overlaying occupations as is the case with other records of the same age in the region and the vicinity. Hence, Doble Lili's occupation is a reliable example of an early Holocene occupation in terms of assemblages, function, and chronology.

**Mendez Bauer, Maria Belen (Universidad Nacional Autónoma de México) and Takeshi Inomata (University of Arizona)**

[164]

*Ceremonial Spaces and Public Events at the Preclassic Maya Centers of Ceibal, Guatemala, and Aguada Fénix, Mexico*

Dr. Jerry Moore's work has been highly influential not only in Andean archaeology but also in the archaeology of Mesoamerica and other parts of the world. Dr. Moore's pioneering analysis of the lived experience of the built environment has inspired us to examine ceremonial spaces at Maya sites, including plazas and other open spaces. Although investigations in the Maya area traditionally focused on temples, palaces, and other buildings, dense interaction involving large numbers of individuals must have taken place in plazas, causeways, and other open spaces. Public events held in those spaces and their memories embedded in those locations had profound social significance. Our excavation of the Central Plaza of Ceibal revealed numerous caches with greenstone axes dating to 950–700 BC. Our subsequent work in eastern Tabasco documented a large platform measuring 1,400 × 400 m and connected with nine causeways/avenues at Aguada Fénix, dating to 1100–700 BC. These spaces served for large communal events during the period when the inhabitants had just begun to use ceramics and many groups still retained certain degrees of mobility.

Menéndez, Damaris [129] see Horowitz, Rachel

**Menéndez Iglesias, Beatriz (Gerda Henkel Foundation, Patrimonies Funding Initiative), Pavel Ulianov Martínez-Pabello (UNAM, Mexico), Guillermo Acosta-Ochoa (UNAM, Mexico), Sergey Sedov (UNAM, Mexico) and Patricia Pérez-Martínez (National School of Anthropology and History, ENAH)**

[241]

*Rock Art in Northern Sonora between Stones and Pigments: Preliminary Archaeometric Analysis*

Sonora has a great concentration of rock art in North America. In order to advance in the analysis and documentation of the rock art groups, the project "Cave Documentation and Patina Study in Northern Sonora" was proposed, focused on Cucurpe (Sierra Madre Occidental) and Caborca (Sonoran Desert). The project's objectives are rock art documentation, the application of new technologies, and the analysis of desert varnish. The archaeometric analysis will be a basic component of this project. Pigment samples were

collected in one of the cave assemblages of Cucurpe, Cueva Higuierillas, where the aim is to determine both the composition of the pigments based on optical microscopy, XRF, and SEM analysis. Furthermore, the analysis of the desert varnish, from the analysis of microstructures, will provide information about how these patinas are formed, their composition, and the possible paleoenvironmental reconstruction of the context, putting it in relation to the rock art of the site. For the analysis of varnish, we rely on samples collected in different locations in the region—streams and hills—associated with rock engravings. Preliminary archaeometric analyses obtained from the pigments and desert varnish are presented here.

Menges, Fabian [20] see Watling, Jennifer

**Meniketti, Marco (San Jose State University)**

**[49]**

*California's Enduring Mystery: The Drake Landing Site Controversy Revisited*

Trace element X-ray fluorescence analysis is applied to ceramics from sixteenth-century shipwrecks in order to help resolve the enduring mystery of the location of Sir Francis Drake's brief landing on the west coast in 1579. The landing site has been debated for decades. Was it California, Oregon, or Washington? Various sites have been proposed and each has its die-hard promoters. The most recent publication concerning the landing site, which has Drake bypass California altogether, is problematic as it gives credence to conspiracy theories. This paper presents a sober examination of the controversy and presents a comparative study of ceramics from Pt. Reyes, California, thought to have been part of Drake's plundered cargo of Chinese porcelains, which he abandoned ashore. These are compared to ceramics from other contemporary sites. The objective has been to determine whether a unique chemical signature can be used to distinguish cargoes. The Pt. Reyes site is complicated by the presence of a Spanish shipwreck occurring less than 20 years later carrying a similar cargo.

**Mentzer, Susan (Senckenberg, University of Tuebingen), Ivo Verheijen (Senckenberg, University of Tuebingen), Britt Starkovich (Senckenberg, University of Tuebingen), Jordi Serangeli (Senckenberg, University of Tuebingen) and Nicholas Conard (Senckenberg, University of Tuebingen)**

**[166]**

*Diffraction Peaks as Tools for Distinguishing Chert from Quartz: Applications on Experimental Materials and Paleolithic Retouchers*

When conducting micro-X-ray fluorescence ( $\mu$ XRF) analyses of archaeological and geological materials, diffraction peaks, which are produced by crystalline materials, are typically unwanted and methods are devised to minimize their impact on the sample spectrum. Here, we explore the intentional production and use of diffraction peaks as a tool to distinguish sand-sized fragments of chert from quartz. These two rock types are common raw materials for lithic technology, but have very similar elemental compositions. A variety of rock fragments—including chert and quartz—were embedded in a set of modern bones, and the fragments were analyzed with both  $\mu$ XRF and micro-Fourier transform infrared spectroscopy. The presence of diffraction peaks in the  $\mu$ XRF spectra allowed for fragments of chert to be easily distinguished from fragments of quartz. The approach was then applied to a small sample of bones from the Lower Paleolithic archaeological site of Schöningen (Germany). These bones were used as retouchers, and the combination of targeted analysis of individual rock fragments with elemental mapping of broader areas allowed for the identification of both embedded chert fragments and the correlation of their distribution with specific use-wear traces.

Mentzer, Susan [214] see Steele, Teresa

Menz, Martin [243] see Dziki, Gabriela

Meoni, Olivia [57] see Mohammadi, Justin

**Merchant, Joe (Rice University), Jeffrey Fleisher (Rice University) and Gry Barfod (Aarhus University)**

**[210]**

*Indian Ocean Glass Beads from Miyoba Mound in the Kafue River Floodplain, Zambia*

This paper reports on an assemblage of Indian Ocean glass beads excavated from the Middle Iron Age mound of Miyoba in western Zambia, at the hook of the Kafue River. Miyoba was a long-occupied settlement during the late first and early second millennium CE represented by approximately 5 m of occupation debris that includes house floors, midden deposits, and iron smithing debris. The assemblage contains 115 glass beads; most are beads with finished ends, with a small number of wound beads. The deepest stratigraphic glass bead is a garden roller, likely imported from K2 in South Africa—this is the northernmost find of a garden roller to date. We will describe the assemblage, examine the chemical signature of a sample of these beads and their connections to previously established bead series, and discuss the implications of the trade in Indian Ocean beads in the far inland for early second millennium Zambia.

Meredith, Ashley [49] see Peterson, John

Mereuze, Remi [173] see Walls, Matthew

**Merkle, Ann (Washington University, St. Louis)**

**[141]**

*Chair*

**Merkle, Ann (Washington University, St. Louis)**

**[141]**

*The Hand-Formed Slip-Painted Pottery of the Central Asian Highlands: History, and a Case-Study at Tashbulak*

The hand-formed, slip-painted pottery (HSP) of the Central Asian highlands is found in mountainous and early Turkic sites throughout the region. It is understudied, and the pottery appears in only a limited number of archaeological syntheses and reports. HSP spread to the Central Asian lowlands in tandem with the spread of the Turkic Qarakhanids, who ruled over a large part of Central Asia between 900 and 1250 AD. This paper is an overview of archaeological research that discusses the hand-formed slip-painted pottery of the Central Asian highlands during the late antique and medieval period (600–1250 AD). In addition to a literature overview, I discuss the HSP that has been found at the archaeological site of Tashbulak in the highlands of Uzbekistan, comparing my findings thus far with those of past and current researchers. As it is understood today, this pottery provides an opportunity to better understand how these early-medieval Turks expressed and disseminated their unique, nomadic, mountain identities while spreading their Turko-nomadic rule over the urban and lowland regions of Central Asia.

Merriman, Christopher [41] see Huckell, Bruce

**Merritt, Stephen (University of Alabama, Birmingham)**

**[214]**

*Is Pseudoreplication a Problem for Experimental Studies of Bone Surface Modification?*

In 1984, Stuart Hurlbert defined pseudoreplication as “the use of inferential statistics to test for treatment effects with data from experiments where either treatments are not replicated (though samples may be) or replicates are not statistically independent” (Pseudoreplication and the Design of Ecological Field

Experiments, *Ecological Monographs* 54[2]:187–211). This manuscript suggested flawed design corrupted a large proportion of ecological experiments, and prompted critical reevaluation of experimental design and analytical methodology in fields beyond ecology, including psychology and animal behavior. In this talk, I draw on examples from my own experimental butchery research to highlight instances of pseudoreplication, discuss appropriate analyses of repeated measurements, and explore different analytical frameworks including Bayesian and machine-learning methodologies that may avoid problems which plague inferential statistics. Specifically, I discuss experimental treatment effects, replication, and independence of observations in experimental butchery trials intended to describe size differences and ultimately discriminate cut marks produced by different Early Stone Age flake and core tools across different anatomical locations on the ungulate skeleton. I conclude with design suggestions focused on replication in bone surface modification experiments and a discussion of how these actualistic data are used to support inferences about archaeological phenomena.

Merryweather, Andrew [232] see Greenwald, Alexandra

**Mesia-Montenegro, Christian (Universidad Privada del Norte) and Angel Sanchez-Borjas (Pontificia Universidad Católica del Perú)**  
**[230]**

*Embedded Religiousness and the Kotosh Religious Tradition in the Peruvian Highlands: La Seductora*

Excavations at La Seductora identified a circular structure with a central hearth and an underground ventilation shaft. We argue that the structure belongs to the Kotosh Religious Tradition. The KRT tradition dominated the Andean landscape, permeating not only religious interactions but also political and economic ones during the Late Archaic and Formative periods. We contextualize the site as part of new evidence for the discussion on power and religiousness in the Central Andes, which can be extrapolated to similar discussions in other areas of the world.

Messenger, Olivia [104] see Wilson, Jeremy

**Messinger, Emma (University of Pittsburgh), Gabriela Saldaña, Jorge Can, Natalie Bankuti-Summers and Jaime Awe (Northern Arizona University)**  
**[74]**

*Terminal Classic Ritual Deposits and Reoccupation at Xunantunich, Belize*

Ritual behavior during the Terminal Classic period (~AD 750–900) in the Belize Valley reflects the ecological and political concerns of the Maya during a time of prolonged drought and balkanization. Following their abandonment, some major regional centers were revisited, often in the context of pilgrimage. These activities left behind expansive deposits, termed peri-abandonment deposits, of pottery, lithics, and faunal remains, among other types of materials. This study reports the results of excavation, artifact analyses, and radiocarbon dating to explore the relationship between the end of construction and creation of peri-abandonment deposits across the courtyards at an elite residential compound at the site of Xunantunich. Results document a complex picture of alternating residential constructions and deposits, indicating parts of Xunantunich were reoccupied after their initial abandonment. This systematic study of the functional patterns in deposits alongside precisely dated construction sequences provides revisions to the occupational chronology of the Terminal Classic collapse in the Belize Valley.

Messinger, Emma [28] see Saldaña, Gabriela

Metcalfe, Jessica [15] see Wygal, Brian

**Meyer, Brett (University of Michigan), Claire Ebert (University of Pittsburgh), Julie Hoggarth (Baylor University), John Walden (Harvard University) and Jaime Awe (Northern Arizona University)**

[76]

*The Role of Diet Diversity and Breadth in the Maya “Collapse”*

Debate has surrounded the Terminal Classic (AD 750–900/1000) Maya “collapse,” a period when the Classic period political structure deteriorated and parts of the southern lowlands were depopulated. While these changes were the result of various developments including warfare, social unrest, environmental degradation, and climate change, one possible contributing factor was the impact of environmental change on food resources. Recent stable isotope analyses of human remains from the Belize River Valley region suggest Classic period elite diets became restricted as social statuses became more distinct, resulting in less resilient food choices during drought conditions. This study builds on these previous analyses by assessing diachronic shifts in faunal assemblages. Taxonomic richness and evenness, species diversity, and species lists are analyzed from Late/Terminal Classic contexts at four sites from the Belize Valley. These contexts, which range from everyday food refuse to special deposits, represent differing responses to stress. Results suggest that these responses lack a diversity of wild fauna across sites, which likely impacted populations as crop yields declined during extreme drought. Availability of food resources, therefore, likely played a significant role in the social and demographic changes in the southern lowlands during the Terminal Classic.

**Meyer, Jana (University of New Mexico)**

[175]

*Physical Effects of Social Status in Early Medieval Thuringia: A Bioarchaeological Investigation of Health and Disease among Individuals from the Merovingian Cemetery of Großvargula, Germany*

Merovingian society (450–751 CE) was strongly stratified with differences in social standing being written in law and affecting many aspects of life, such as occupation and access to material, nutritional, and medical resources. How did these status differences become embodied in Early Medieval Thuringia? This study explores the cumulative effect of status-based lifestyle factors onto a variety of health indicators visible in the human skeleton based on a sample of about 60 individuals from the cemetery of Großvargula in Thuringia, Germany. The cemetery was excavated from 2019 to 2020, and dates to the Merovingian period. During this time, status differences were indicated by grave goods, which is expressed in Großvargula by a pronounced variation in both quantity and quality of burial items ranging from simple pottery to elaborate jewelry and swords, facilitating a comparison between individuals of higher and lower social status. Among the health indicators included in the comparison are reconstructed body height, evidence of hematopoietic and metabolic disease (anemia, scurvy, rickets/osteomalacia), nonspecific indicators of stress (enamel hypoplasia, periosteal reactions, growth arrest lines), skeletal trauma, and osteoarthritis. The presentation will show drawings of human remains, which will be based on photographs and X-rays from European skeletal specimens.

Meyer, Kelton [170] see LaBelle, Jason

**Meyer, Matthew (Murray State University), Marcie Venter (Murray State University) and Christopher Pool (University of Kentucky)**

[216]

*Compositional and Stylistic Analysis of Texcoco-Molded Censers and Molds from the Gulf Lowland Frontier of the Aztec Empire*

Over the past 20 years a growing assemblage of Aztec-style ceramics, specifically Texcoco Molded censers and molds, has been recovered from sites throughout the northeastern Tlaxcala province of the Triple Alliance Empire. In this presentation, we examine the chemical compositions using pXRF, paste recipes, and decorative attributes and configurations of these censers, as well as the molds for their production. We compare imperial-style materials found within the western Tuxtla Mountains and the Eastern Lower

Papaloapan Basin with undecorated ceramics made using long-enduring paste traditions. The point of this analysis is to determine the degree of affinity with existing ceramic resources and the products of ceramic communities of practice, as well as the potential modes of exchange and adoption of this nonlocal imperial style. We will consider a variety of models for incorporation, including the movement of pots, people, and ideas.

Meyers, Emlen [46] see Siegel, Peter

Meyers, Maureen [217] see Ritchison, Brandon

**Michelaki, Kostalena (School of Human Evolution and Social Change, ASU)**

**[216]**

*Chair*

**Michelaki, Kostalena (School of Human Evolution and Social Change, ASU), Andrea Torvinen (School of Human Evolution and Social Change, ASU) and Andrea Berlin (Boston University)**  
**[216]**

*Pan-American Ceramics Project: Increasing the Accessibility and Interoperability of Ceramic Data in the Digital Age*  
Pottery is a powerful tool for understanding past societies. The timing and function of a site, the nature and rhythms of daily life, and the social relations of site inhabitants with each other and with people from far away regions are questions archaeologists ask of ceramic data regularly. The power of such data can be greatly enhanced when they are digitized and aggregated into a common framework that expands their temporal and spatial breadth. As an open-access, digital repository, the Pan-American Ceramics Project seeks to increase the accessibility and interoperability of ceramic data spanning from Canada to Argentina, and dating to all time periods, revolutionizing the breadth of research across international borders. Accomplishing this goal requires the formation of a collaborative network of experts in both ceramic analysis and the regional and temporal trends of pottery manufacture in ancient America. Such experts must include Native, descendant, local, and other archaeologists, potters, and educators alike. This presentation will illustrate the current functions of our web application, outline future capabilities in development, and serve as an invitation to those interested in joining our community by contributing their insights and data, and advancing the practice of digital archaeology.

Michelaki, Kostalena [216] see Kolb, Charles

**Michelet, Dominique (CNRS/Université de PARIS I) and Pierre Becquelin (CNRS/Université de Paris I)**

**[93]**

*Non-standard and Shifting Sociopolitical Organizations at Xcalumkín (Western Puuc Region), AD 650–950*  
With the publication of the influential *Chronicle of the Maya Kings and Queens* (Martin and Grube 2000) along with the convincing analysis of the Classic Maya political universe in terms of city-states (Grube 2000), a Classic Maya political regime model seemed to have been set up, relying on divine kingship based more on the domination of people than of territories (see also the recent volume edited by Okoshi, Chase, Nondédéo, and Arnaud 2021). Nonetheless, political structures in the Classic Maya world were much more variable than that which has been recognized to date. Research carried out at Xcalumkín between 1992 and 2007 proved that between the end of the seventh century and the middle of the tenth century, this important local center has experienced three successive and distinct forms of governance. However, all of these present a same organization, comparable to that of moiety communities, a well-known and documented system among cultural anthropologists working in America but seldom explored by archaeologists in the Classic Maya Lowlands, even though there are important data suggesting its existence.

**Micheletti, George (University of Central Florida)****[9]***Analyzing Periphery Ritual Practice through Time to Identify Intra-polity Relationships at the Ancient Maya Center of Pacbitun*

Ritual and its practice were essential mechanisms for negotiating social identity, status, and political involvement for all members of ancient Maya society. Yet, changes to ritual practices through time are often framed around the legitimization of royal elite, reifying traditional models of dominant ideology. Identifying how ritual of periphery households changed alongside the politically charged Preclassic and Classic period alterations of epicenter rituals can provide a glimpse at intra-polity social interactions by revealing the agency of everyday people. Recent investigations of household and public ceremonial contexts in the periphery at the ancient Maya center of Pacbitun, Belize, examined alterations to ritual practices through time and how these changes coincide with known shifts in epicenter elite rituals associated with Late Preclassic emerging elite leaders, Early Classic institutionalization of kingship, and Late Classic dynastic interruption. My discussion will compare Pacbitun's epicenter and periphery ritual data through time, materialized through special deposits and architecture. Findings suggest that while changes to periphery ritual activity and practices do coincide with alterations to epicenter rituals through time, household and communal practices in the periphery are independent of epicenter elite until the Early Classic period. These findings support a negotiated shift from semi-autonomous to dependent intra-polity interactions.

Migration Collective CfAS [217] see Beekman, Christopher

Mika, Anna [88] see Gala, Nicholas

**Miles, Aimee (Uppsala University)****[211]***From Field to Table: Critical Perspectives on the Social Dynamics of Field-Based Learning, and How They Can Help Us Refine More Reflexive Educational Approaches*

Ethical questions surrounding the social politics and disciplinary culture of archaeology—especially questions arising from the unequal power dynamics pervasive in fieldwork settings—have primarily been framed as professional problems and are seldom considered from a pedagogical perspective. In this paper, I argue that fieldwork (and by extension, field-based study) may be regarded as a “pedagogical laboratory” where unacknowledged power structures that shape cultures of higher education and research practice are thrown into sharper relief. Adopting critical perspectives on the social politics of archaeological fieldwork, I begin by examining how these dynamics not only impact student learning experiences but also leave their imprint on archaeological interpretations of the past. Taking this position as a point of departure, I explore the premise that, in order to foster more equal and inclusive learning environments in both the field and the classroom, disciplinary discourse ought to reflect a critical awareness of the sociocultural and historical contexts governing the production of scientific knowledge, and equip students with the intellectual tools to critically evaluate their own research and learning environments. I advocate for pedagogical reforms that broadly integrate disciplinary reflexivity, norm-criticism, and multivocality as foundational concepts in undergraduate education, with potential applications beyond archaeology.

**Miller, Bryan (University of Michigan)****[79]***Discussant***Miller, Bryan (University of Michigan) and Jamsranjav Bayarsaikhan (Max Planck Institute)****[244]***Imperial Impact: Population Dynamics and Political Landscapes of Inner Asia under the First Steppe Empire*

This paper integrates survey, mortuary, and genetic research into a multidisciplinary and multiscale consideration of the impact that large political regimes like empires have on the social landscapes of individual

communities and whole regions. In the case of the first steppe empire of Inner Asia (Xiongnu), while material accoutrements of political culture became increasingly homogenous across vast areas of the steppe, constituents of local communities became increasingly intermixed and their respective locales were reorganized into new regional hierarchies that fed into the supra-regional polity.

Miller, Christopher [181] see Skowronek, Russell

**Miller, D. Shane (Mississippi State University), Derek Anderson (Mississippi State University), James Strawn (University of Georgia) and Stephen Carmody (Troy University)**  
**[89]**

*The Curious Case of Stemmed Jude Points in the Upper Tombigbee River Valley, Mississippi*

In the American Southeast, there are only a limited number of securely dated sites from the Late Pleistocene and Early Holocene, and type descriptions are often cobbled together across subregional projectile point guides. Many of these projectile point types are poorly defined and lack any kind of chronological underpinning. One such type, the stemmed Jude, has a limited distribution in northeastern Mississippi but has recently been recovered from a dated, Late Pleistocene/Early Holocene context at the Hester site in Amory, Mississippi. Here, we argue that this type may be among the earliest stemmed varieties in the American Southeast.

**Miller, Heidi (University of South Florida) and Christopher DeCorse (Syracuse University)**  
**[175]**

*A Biocultural Analysis of the Impacts of Interactions between West Africans and Europeans during the Transatlantic Trade at Elmina, Ghana*

**[WITHDRAWN]**

**Miller, Hollis (SUNY Cortland)**  
**[113]**

*Sugpiaq Foodways during the Russian Colonial Period: Zooarchaeological and Ethnographic Perspectives from Old Harbor, Alaska*

Sugpiaq/Alutiiq peoples have millennia-long relationships with the coasts and waters of the Kodiak Archipelago, from which they harvest a variety of marine mammals, fish, shellfish, sea birds, and coastal plants. Harvesting and preparing these foods remain important ways of life in Sugpiaq/Alutiiq villages, such as Old Harbor, Alaska. An examination of traditional foodways is a key component of the Old Harbor Archaeological History Project, a community-based participatory research program exploring the resilience of the Old Harbor Sugpiaq/Alutiiq community during the Russian colonial period (1760–1867 CE). In this paper, I draw on zooarchaeological analysis of fauna from the Ing'yuy site (KOD-114), a colonial period Sugpiaq village, to discuss how harvesting became more localized following the Russian invasion in response to increasing labor demands on a decreasing Indigenous population. I complement this discussion through ethnographic interviews with contemporary residents of Old Harbor to better situate the archaeological data within the cultural values and traditions that guide Sugpiaq harvesting practices. These lines of evidence tell a story of survivance in the face of Russian colonialism as Sugpiaq ancestors at Ing'yuy creatively maintained their relations to the land and water while simultaneously managing colonial impositions on their labor, bodies, and ways of life.

**Miller, Mary**  
**[58]**

*Discussant*

**Miller, Mary****[238]***The Grolier Codex and the Early 1960s*

The Grolier Codex was reportedly found with other objects, including the Kislak box, the Dumbarton Oaks turquoise mask, and other objects in the United States and abroad. In this brief talk, these objects and their context will be addressed, as well as the likelihood of their having been recovered as a meaningful ancient deposit.

**Miller, Naomi (Univ of Pennsylvania Museum & ISAW) and Chantel White (University of Pennsylvania Museum)****[114]***Historical Palimpsests: Animal-Accumulated Plant Remains in Aboveground Structures*

Archaeologists periodically encounter concentrations of uncharred plant remains in standing structures. Whether excavated or never actually buried, they are a challenge for interpretation. In addition to identification, the archaeobotanical tasks include determining the agent of deposition and the source and date of the material. This paper considers how interpretation of uncharred material has to consider the interplay between human and animal vectors with the excavated example of the Calvert Site crawl space and intramural deposits at other historic sites.

**Miller, Sarah****[120]***Discussant***[167]***Chair***Miller, Sarah****[167]***Defining Site Stewardship: Origins and Our Family Tree*

The main work areas of cultural site stewardship are easy to identify: access to authentic sites for assessment, repeat visits to heritage sites, a database to track changes in those sites over time, and volunteer training partnered with professional archaeologists. However, the “why” for doing this is more than the sum of its identified parts. Defining site stewardship is as difficult as defining heritage. Where the Authorized Heritage Discourse definition of heritage includes a lengthy list of nouns: people, places, and things; in contrast, the Unauthorized Heritage Discourse definition of heritage leans into actions and verbs: heritage as a cultural process, experience, identity (Laurajane Smith 2006). Site stewardship is much the same and may be best understood as a cultural process. Site stewardship thus didn’t begin with any state or management unit, but repeat visits to sites for centuries by Indigenous and First Nations people, to pass on knowledge and track changes to traditional areas over time. Building on Rubinson’s 2014 survey of seven statewide site stewardship programs, this presentation will share preliminary findings from the National Site Stewardship 2022 survey, categorize new programs, and look at divergent origin stories, such as programs created to address impacts of climate change.

**Miller, Sophie (University of Oregon)****[128]***Chair***Miller, Sophie (University of Oregon)****[128]***A Tale of Dead Kitties: Theorizing Human-Animal Companion Relationships and Social Domestication through the Anatomization of Ancient Cats*

Current discourse articulates domestication as a series of actionable, multidimensional processes, shaped by

temporally relevant cultural and social factors; “social contracts” (sensu Armstrong Oma) as maintained, agentive, sustained human-animal relationships. This definition is particularly relevant when studying animals who lack distinctive/definitive “changes” with domestication, where we must use contexts and alternative material traces. However, if there is minimal or no direct evidence in the archaeological record, how can we reconstruct domestication? Can animal presence serve as sufficient evidence for presumptive, ongoing domestication? What about interpreting ambiguously evidenced domesticates valued by modern societies, while avoiding potential anachronisms? I propose the domestic cat (*Felis catus*): often attributed as “marginally-domesticated,” “semi-domesticated,” or even “self-domesticated.” The entrance of cats to ancient life has been surmised through theoretical deliberation, but the validation of these ideas is often speculative. These deep companion-commensal relationships often have scarce archaeological evidence, further complicating our understanding of human-cat dynamics. This talk presents a potential framework for reconstructing early human-cat relationships, combining data on general timing and geographic (archaeological) contexts, with theoretical human-animal relational dynamics and social zooarchaeology. I posit that, to thoroughly explicate cat domestication, and other comparable commensals, one must amalgamate available evidence with appropriate middle-range multidisciplinary theories.

Miller, Steph [100] see Clark, Jessica

Miller, Steph [140] see Dine, Harper

**Miller, Virginia (University of Illinois, Chicago)**

[58]

*Reexamining the Chacmool, One More Time*

The striking recumbent stone figure known as a chacmool is a defining feature of the Mesoamerican Terminal Classic and Postclassic, occurring not only at Chichen Itza and Tula, where the largest number of figures is documented, but also in later Mexica and Purépecha cultures. While Maya examples are known from as far away as Quiriguá and Tazumal, chacmoos are never seen in Oaxaca or the Gulf Coast. Otherwise, Maya chacmoos only occur in Yucatán, where they are no longer produced during the Postclassic. Probably introduced at Chichen Itza sometime after 800, the chacmool was adopted by other groups emulating the beliefs and cultural practices of that powerful and artistically innovative city. Although much modified by the Late Postclassic, the chacmool still featured prominently in Mexica ritual, demonstrating its staying power through several centuries and across a wide swath of Mexico and Central America. Apart from examining the identity and function of the chacmool—both still poorly understood—this paper will focus on the enigmatic sculpture as a symbol of the movement of people and ideas in Mesoamerica during a period of profound cultural change.

**Miller Wolf, Katherine (University of West Florida)**

[193]

*Discussant*

Miller Wolf, Katherine [11] see Flynn-Arajdal, Yasmine

**Millhauser, John (North Carolina State University)**

[83]

*Discussant*

**Millien, Sebastian, Kristine Korzow Richter, Richard Meadow and Christina Warinner**

[71]

*ZooMSing to Harappan Animal Husbandry: Taxonomic Identification Using Peptide Mass Fingerprinting of Indus Valley Civilization Faunal Remains*

The Indus Valley Civilization at its peak extended over 1 million km<sup>2</sup> and encompassed an estimated five

million people, with over 1,000 sites identified. Although faunal remains have been recovered from the excavations of approximately 100 archaeological sites, very few have been analyzed using biomolecular methods. This is largely because many of the sites have poorly preserved faunal assemblages. As Zooarchaeology by Mass Spectrometry (ZooMS) requires only a small amount of bone collagen, it has been successfully employed where other biomolecular methods were unsuccessful. The taxonomic resolution that ZooMS could provide is important for questions of animal management, husbandry, and exploitation including independent domestication events. Here, we applied ZooMS on faunal remains from three Indus Valley Civilization sites ranging from 7000 to 1500 BCE: Harappa, Mehrgarh, and Nausharo. We tested extraction and purification methods in order to optimize ZooMS for these sites and successfully employed ZooMS to improve taxonomic identifications of the faunal assemblages.

**Millones, Mario (Museo Tumbas Reales)**

[50]

*Emotions Underground: Facial Expression in the Andean Past through the Portrait Vessels (Huacos Retratos, a Heterodox Approach to the Emotions of the Past)*

The critical role of emotions in any social framework is a problematic element to address from the archaeological record. The nuances of nonverbal communication preceded articulated language and the production of any other communication record in the human species. Behavioral studies, supported by neuroanatomical registration, allow the detailed registration of facial expressions to mark some significant guidelines for interpreting emotions. Historiographical contribution to emotions contextualizes and contrasts the content meaning and rapid change in time. On the other hand, artistic creation has a powerful normative axis in representing emotions. For the Andean case, the study of emotions lacks a systemic approach based on the ethnographic or linguistic record. This research takes advantage of the enormous richness of the Moche portrait vessels (AD 100–900) and suggests a heterodox approach to the registration and interpretation of the emotions from the past.

**Mills, Barbara (University of Arizona), Sarah Herr (Desert Archaeology Inc.) and Matt Peeples (Arizona State University)**

[60]

*Reimagining the African Internal Frontier Model: Implications from the Puebloan Southwest*

Igor Kopytoff's (1987) model of the African Internal Frontier has impacted archaeological research in many areas of the world, including the US Southwest. His model has undergone considerable rethinking, such as Akinwumi Ogundiran's (2014) work on the historical period of southwest Nigeria. We revisit the internal frontier model in light of research by African archaeologists and our own work in the Mogollon Rim region of the Southwest. Physiographically, demographically, and socially transitional, the Rim region provides a well-documented case study for looking at "edge region" or frontier dynamics. We discuss ways in which the Southwest's internal frontier was constructed and changed from the eleventh through fourteenth centuries. These include the importance of recognizing frontier-frontier rather than center-periphery migration; acknowledging frontiers as socially heterogeneous, dynamic zones of innovation; showing how frontier social networks operated differently than those in more demographically dense areas; and discussing the ways in which frontiers were (and are) more susceptible to climatic and social crises. Our examples provide a comparative case to the study of internal frontiers worldwide and acknowledge the contributions of scholars working in Africa to global archaeology.

**Mills, Peter (University of Hawaii, Hilo)**

[207]

*Discussant*

**Mills, Peter (University of Hawaii, Hilo)**

[35]

*Large Things Forgotten: The Hawaiian Monarchy's Sailing Fleet, 1790–1840*

Beginning in 1790, Hawaiian *ali'i* (royalty) appropriated Western sailing technology to facilitate fundamental transformations of interisland tributary systems, alliance building, exchange systems, and emergent forms of Indigenous capitalism. By 1840 *ali'i* had either built or purchased over 60 sailing vessels that we know the names of. Dozens of others appear in ethnohistorical accounts. A summary of available information on this fleet is presented, along with known wreck sites and foreign ports that these Indigenous-owned vessels visited. cursory historical treatments of these vessels have often dismissed their value as examples of chiefly folly, but they were essential elements in Hawai'i's rapidly evolving nineteenth-century political economy.

**Milton, Emily (Michigan State University), Sarah Meinekat (University of Tübingen), Katherine Moore (University of Pennsylvania) and Kurt Rademaker (Michigan State University)**  
[74]

*New Investigations at Pachamachay and Panaulauca Caves, Junín, Peru*

We present the results of 2019 excavations at Pachamachay and Panaulauca, two Early Holocene archaeological sites in the high Andes of central Peru. These classic sites, previously excavated in the 1970s and 1980s, provide evidence for early and persistent use of the high-elevation (>4,000 m asl) Andes mountains. We used a low-impact approach to access previous excavation profiles and generate improved chronological and stratigraphic data. We also redocumented the sites using high-resolution geographic and imaging technologies. New basal AMS ages securely date Panaulauca and Pachamachay to the Early Holocene (11.1–10.6 ka and 9.7–9.5 ka, respectively). Using our new chronology, we recontextualize previous lithic and faunal data and share preliminary insights from the sediment micromorphology analysis. Our recent data, in concert with legacy collections, published work, and new geographic information and imagery, provide a pioneering approach for reviving iconic sites excavated in the 1900s. Holistically, this work contributes to an improved understanding of early human exploration and occupation of extreme environments.

Minc, Leah [146] see Carpenter, Lacey

**Mink, Kirsten (Idaho State University), Antonio Beardall (Texas State University), Victoria Izzo (Texas A&M University) and Jaime Awe (Northern Arizona University)**  
[134]

*Where the Temple Meets the Road: Salvage Burial Excavation in San Ignacio, Cayo District, Belize*

No country is immune to crumbling infrastructure and (un)predictable weather that exposes archaeology. How we deal with these sudden assemblages and how we use the information gained from these quick and limited excavations can be a place of growth in our field. This can be most crucial in salvage burial excavations. The biological, especially the human, aspect of a site can be important, but tends to be overlooked in salvage projects due to time and financial constraints. This paper gives one such example of a salvage excavation of a burial outside the San Ignacio Resort in Cayo District, Belize. The limitations of time, access, and safety led to a partial excavation and therefore partial biological interpretation of the skeletal assemblage. Through this case study the authors will discuss what information was gained from the bioarchaeological analysis, the interpretation of the site within the larger Cahal Pech area, and future field protocols that could be put in place to aid in efficiency of excavation. It is the hope of the authors that having these conversations and learning from our experiences, will lead to new policies and methods for future bioarchaeology salvage excavations.

Miranda, Yalilich [200] see Ávila, Claudia

Miranda de Morais, Hugo [205] see Lewis, Brandon

Mirro, Michael [115] see Spenard, Jon

Mirzaakhmedov, Sirodj [134] see Monroe, Shannon

Misarti, Nicole [29] see LaZar, Miranda

**Miszaniec, Jason (University of Wisconsin, Madison), Paul Szpak (Trent University), John Darwent (University of California, Davis) and Christyann Darwent (University of California, Davis)**

**[218]**

*Why Screen-Size Matters for Isotopic Analysis of Archaeological Faunal Remains: A Case Study from Norton Sound, Alaska*

Saffron cod (*Eleginus gracilis*) are small nearshore fish distributed throughout the Pacific and Arctic oceans and were a staple to preindustrial Indigenous fisheries of Western Alaska. Fish, mammal, and bird-bone were sampled for carbon and nitrogen stable isotopes from sites in Norton Sound, Alaska, spanning 2500 BCE–1850 CE. Comparing our results to regional climate datasets, saffron cod from warmer periods showed higher mean carbon and nitrogen values. Identification of seasonal taxa suggests that diachronic variability may be a product of seasonal human foraging behavior rather than climate. Enriched isotopic values in saffron cod are a product of their benthic diets, coupled with winter fishing practices targeting starving spawning adults. Saffron cod yielded isotopic values comparable to those of marine mammals. Thus, relying on inadequately screened assemblages to generate isotopic baselines may overemphasize the contribution of marine mammals while masking the importance of benthic foraging fish. In addition, when conducting diachronic analyses of dietary change, season of capture must be factored into the interpretation. Our results emphasize that archaeological field sampling methods can generate incomplete baselines for coastal settings and potentially underestimate the contribution of small fish to dietary isotopic values in humans.

Mitchell, Douglas [75] see Montero, Laurene

**Mitchem, Alexandria (Columbia University)**

**[68]**

*Historical Ecologies of Botanical Gardens: Archaeobotany at Bartram's Garden (Philadelphia, PA)*

The collection and transport of natural specimens during the long eighteenth century had political, intellectual, and ecological effects. Botanical gardens are key loci to examine the material histories of these processes. Bartram's Garden, the most prominent botanical garden in North America during the late eighteenth and early nineteenth centuries, provides the ideal site for studying these sites of knowledge production. While the historical plant communities found in this and other gardens are critical data points, reconstructing them archaeologically is difficult due to issues of preservation and requires a traditional datasets. Historic preservation work in the 1970s uncovered a large rodent cache under the floor of the Bartram House attic that contained eighteenth- and nineteenth-century material including animal bones, newspaper and handwritten fragments, fabric, insects, and large amounts of desiccated plants. Using this material, I synthesize macrobotanical, zooarchaeological, and entomological evidence of the historic garden environment. I use this data to explore life at Bartram's Garden in more detail, in particular evidence of the plant communities present in the garden and the changing ecologies of the greater Philadelphia region. My investigations reveal new ways in which the cultural and intellectual ideal of the botanical garden articulated with its ecological background.

**Mixer, David (Binghamton University)****[242]***Creating Ruins, Creating Heritage at Actuncan, Belize*

The precolonial Maya city of Actuncan was occupied as a monumental center, then a city, for approximately 2,000 years from its establishment prior to 1000 BC until its abandonment around AD 900. As at any long-occupied urban center, the city grew when it thrived economically and politically, while it contracted and became ruined when times were more difficult. Over time, the city's built environment became a patchwork of new and well-maintained spaces next to old, ruined locales. I have previously described how Actuncan's community drew on the city's ruined landscape to legitimize a new inclusive political ideology during the Terminal Classic period (AD 780–1000). In this paper, I focus on the creation of those ruins. Ruins were created at Actuncan during multiple political moments. The specific contexts of these moments conditioned how the community managed these spaces. I draw on examples of ruining from Actuncan to show how the growing theoretical literature on cultural heritage in the modern world can be used to understand the management of ruins in the past. Combining general heritage theories with specific Indigenous perspectives provides a rich framework for understanding the challenges and importance of ruins to past communities in Mesoamerica.

**Mizoguchi, Koji (Kyushu University, Japan)****[39]***Discussant*

Moço, Ana Margarida [205] see Lorenz, Samantha

**Moe, Jeanne (Institute for Heritage Education)****[143]***Archaeology Education for Teachers: Getting Results*

Archaeologists have long considered classroom teachers as partners in our efforts to educate the public about the significance of archaeological sites and the importance of protection. While programs and projects on local, state, and national levels have provided professional development and educational materials for teachers for several decades, we have very little research on what teachers learn from professional development and how they implement these materials in their classrooms. In 2021, Southern Utah University conducted a National Endowment for the Humanities funded institute for 71 teachers from 31 states. The five-day institute featured three Project Archaeology curricula covering the archaeology of the Fremont people in Utah and the rich rock art of the region. Members of local tribes provided a broad perspective on the archaeology and oral history of the Fremont and contemporary people. Field learning at Fremont archaeological sites and expert speakers rounded out the institute. Research uncovered what teachers learned at the institute and their assessment of the value of the institute. A longitudinal study followed how the teachers implemented the materials and professional development in their classrooms over the next academic year. This paper reports research results and potential applications to similar efforts throughout the nation.

**Moffatt, Maren (University of Utah), Brian Coddling (University of Utah), Kenneth Vernon (University of Colorado, Boulder) and Simon Brewer (University of Utah)****[27]***Classification of Fremont Ceramics Using a Neural Network*

Ceramic classification is central to archaeological analysis, but without systematic and objective quantification, archaeologists cannot determine the definitive number of types or what they represent, despite decades of research. Recently archaeologists have applied machine learning models to improve the effectiveness of ceramic classification and extend the use of ceramics as a relative dating method for archaeological sites. To evaluate the efficacy of this approach, here we train a machine learning model on the Fremont type collection ( $n = 333$ ) from the Basin-Plateau region of North America, and test how accurately a neural network can identify existing Fremont ceramic typologies. The neural network consistently distinguished between three of

the six types of Fremont Gray Ware. These types are noted to have distinct decorative patterns. With larger sample sizes, the neural network would likely have increased success in identifying less distinctive patterns. This technique will be further applied to rock art from archaeological sites in Utah.

Moffatt, Maren [97] see Cole, Kasey

**Mohammadi, Justin (University of Maryland), Stefan Woehlke (University of Maryland) and Olivia Meoni (University of Maryland)**  
[57]

*The Role of Infrastructures in the Production of Multigenerational Inequality in a Historic Black Community: The Case of North Brentwood, Maryland*

North Brentwood is a historic Black community on the outskirts of Washington, DC. It is the second Black town incorporated in Maryland, and the first suburban one in the state. Its founding is steeped in the exploitation of social and environmental infrastructures to turn a profit on precarious lands that could not be sold to White residents. The mitigation of these risks is still the paramount concern of community members, who continue to face catastrophic damage and loss, despite the construction of infrastructure intended to mitigate it. The North Brentwood Digital Heritage Project was started in 2021 to document the built environment of the town and preserve its legacy in the face of climate change and gentrification. The North Brentwood Archaeological Project was started in 2022 to collect evidence of the town's development, the flood-prone legacy buried in its soils, and the cultural materials of its residents, who have persevered, despite the new and recurrent challenges they face each generation.

Mohr, Bridget [102] see Wampler, Marc

**Moles, Anna (University of Groningen)**  
[243]

*Health, Mobility, and Burial Practices: Lifeways and Deathways at Aventura, Belize*

Human remains are found in a variety of contexts at Aventura: as primary burials below the floors of houses, as secondary burials or caches also below the floors, and even in middens. The preservation of the bone is very poor and therefore the recovery of individuals is often less than 25%. This sometimes makes the interpretation of identifying whether a burial was a primary or secondary deposition difficult. Additionally, when just a few small flakes of bone are present (often alongside an upturned pot) and it cannot be determined whether the bone is human or faunal, it can be hard to interpret the nature of such a deposit. The analysis of the human remains has nevertheless provided insight into the health, diet, and lifeways of individuals from both elite and commoner households at Aventura. As well as considering the burial practices, this paper looks at the age-at-death and sex for demographic composition, dental disease and stable isotope analysis for diet, dental nonmetric traits and isotopes for biodistance, relatability and migrations, and dental modifications in relation to social status. We consider the health and cultural information from the human remains in relation to social (in)equality. This presentation contains archaeological human remains.

Mollel, Sarah [2] see James, Sydney

**Møller, Kirstine**  
[10]

*Colonial Households and Homes: Changes in Kalaallit Architecture, 1750–1900*

From the initial colonization of Kalaallit Nunaat, houses and housing have been a contested subject. The Danish Trade wanted Kalaallit Inuit to live traditionally as before missionization, spread out and following the animals, thus increasing the economic return. However, the Mission wanted Kalaallit Inuit close to the colonies because it would ease contact and teaching Christianity to Kalaallit Inuit. The Danish Mission

submitted to the Trade's settlement policy, but the Moravian Missions did not. In Southwest Greenland, the settlements connected to the Moravian Missions grew to the chagrin of the Danish officials. Around 1700 a new house form emerged. Some Kalaallit Inuit abandoned the smaller rounded houses in favor of communal houses. These were much larger to accommodate several families and had space to prepare, sew, and dry the long, slender forms of *umiaq* and *qajaq*, vital hunting technology for whaling and sealing. Whereas Kalaallit Inuit understood their home as a site of community and resilience, the colonial administration chastised the communal houses as filthy and unsanitary. This paper examines the competing discourses of colonial Inuit housing in the nineteenth century. It explores how Kalaallit Inuit's houses and households were treated in contemporary historical sources and contrasted with archaeological evidence.

Monaghan, John [176] see Reid, David

**Monagle, Victoria (University of New Mexico)**  
[245]

*The Archaeological Dogs of New Mexico*

Archaeologists frequently use single archaeological events to infer the entirety of the human-dog relationship in a particular time and place. While this practice makes sense given the limited sample of archaeological canids, it can lead to a one-dimensional understanding of how these two species interacted. The American Southwest, an arid region with a history of well-preserved archaeological sites, prehistoric patterns of human social change, and an extant group of direct indigenous descendants, provides a unique opportunity to study human-dog relationships through multiple lines of evidence in one region over a span of at least 1,600 years. This paper collates and contextualizes the archaeological dog record in New Mexico to discuss the variability of prehispanic human-dog relationships in the Southwest, and provide a more nuanced understanding of how dogs might have participated in early human communities.

**Monge, Susan (University of Illinois, Chicago)**  
[5]

*Moderator*

[5]

*Discussant*

Monge, Susan [244] see Brunson, Katherine

Mongelluzzo, Ryan [64] see Le Moine, Jean-Baptiste

**Monnier, Gilliane (University of Minnesota)**  
[168]

*Discussant*

[168]

*Chair*

**Monnier, Gilliane (University of Minnesota), Gilbert Tostevin, Goran Pajovic, Mile Bakovic and Nikola Borovinic**  
[240]

*Synthesizing Results from the 2017–2022 Excavations at Crvena Stijena*

The excavations at Crvena Stijena from 2017–2022 have had two main objectives. The first is to test the Sandgathe/Dibble hypothesis that Neanderthals did not have the ability to make fire; rather, they were dependent on natural occurrences of fire. The testable implication of this hypothesis, stemming from the

published debate, is that evidence for fire should be negatively correlated with rigor of climate. Our second objective has been to understand, in a general way, the nature of the Neanderthal occupation throughout the Middle Paleolithic sequence. Here we synthesize the preliminary results of the ongoing multidisciplinary research project designed to achieve these objectives. Evidence for fire stems from calculated frequencies of charcoal, burnt lithics, and burnt fauna. Climate is inferred from detailed environmental studies of macrobotanical remains, macro- and microfauna, and molecular biomarkers. Neanderthal cultural behavior at the site is reconstructed through detailed analyses of modes of subsistence, raw material procurement, and technology (lithic and pyrotechnological). Importantly, these analyses are contextualized within a rigorous geo- and microarchaeological program that tracks site formation processes through micromorphology and mineralogical analyses.

Monnier, Gilliane [240] see Bao, Yige

Monnier, Gilliane [240] see Cooper, Aspen

Monnier, Gilliane [240] see Mallol, Carolina

Monnier, Gilliane [240] see Morin, Eugene

Monroe, Cara [163] see Johnson, Sarah

**Monroe, Shannon (NYU-ISAW), Sören Stark (NYU-ISAW) and Sirodj Mirzaakhmedov (Institute of Archaeology, Uzbek Academy of Science)**  
[134]

*Preliminary Results of Skeletal Analysis from the Early Muslim Period Cemetery of Bukhara (Uzbekistan)*

Bukhara (in modern Uzbekistan) was a center of learning, power, and innovation during the “Lost Enlightenment” of the late first and early second millennium CE in Central Asia. At the same time, the metropolis faced crises familiar to city-dwellers today, such as controversial land use policies and outbreaks of infectious disease. In the summer of 2022, the Uzbek-American Expedition to Bukhara excavated a cemetery dated to the ninth to fourteenth centuries, revealing new evidence for life in the medieval city. Skeletons from this excavation ( $n = 57$ ) are the first to be analyzed from this context, due to continuous site occupation. Preliminary results indicate the presence among the deceased of infectious disease, artificial cranial deformation, metal bodily ornamentation, and sharp force trauma on the lower limbs, possibly indicating horse-mounted combat. Styles of interment varied within the cemetery. Furthermore, the deceased represented every age cohort (from neonatal to old adult) and both sexes (and individuals of indeterminate sex). This data provides a new means to study the history of Bukhara through bioarchaeological investigation. This presentation includes photos of real human skeletal remains.

**Monrreal, Sahar**

[10]

*Images of Race in the Colonies: The Material Culture of Food, Foodways, and Early Twentieth-Century American Imperialism*

The use of popular images containing people of color in colonial settings serve as a useful tool for archaeologists using widely circulated images like advertising for explaining or enhancing discussions regarding racial and social differences found in the historical record. However, as more than a supplement to archaeological discussion, these images can be used as sources of historical and archaeological information regarding social status, roles in economic production, race, and culture. For example, photographs of foreign countries during the height of American imperialism have contributed to hierarchical notions of race, space, and civilization, as well as the “othering” of colonial peoples and places. More specifically, selections from a group of ads that will be discussed here can be placed soundly within the scientific and imperial rhetoric of the late nineteenth and early twentieth centuries concerning the depiction of colonial peoples and places. Using these images as evidence of commercial imperialism and commodity racism, it can be demonstrated how food products, through their ubiquity, serve as common and powerful examples of material culture that

promoted and established, not only American global economies and ideals about food and foodways but also constructs of racial difference in colonial populations during this era.

**Monteith, Francesca (North west University, Xi'an)**

[67]

*Chair*

**Monteith, Francesca (North west University, Xi'an), Chun Yu (North west University, Xi'an) and Gaomin Qin (North west University, Xi'an)**

[67]

*Searching for Cities: Problems and Solution in Tracing Han Dynasty Settlements in Nanyang and Ankang, China*

This paper presents the results of technology assisted ceramic surveys, interviews, and GIS analysis undertaken in the Nanyang Basin during the summer of 2022. The Nanyang Basin has been the site of continuous human occupation for at least 5,000 years. While prehistoric sites are relatively well known and documented, sites in the historical period remain restricted to temples, palaces, and tombs. Tracing the historical settlements in this region is problematic. In contrast to other global regions, such as Europe and the Middle East, buildings in China do not preserve well, being constructed of mudbricks and wood on earthen platforms with only the most elite houses using roof tiles.

**Montenegro, Alvaro**

[1]

*Discussant*

**Montenegro, Alvaro, Boel Bessemer-Clark (Gothenburg University), Ashley Green (Gothenburg University) and Johan Ling (Gothenburg University)**

[92]

*Improved Representation of Paddled Propulsion in a Deterministic Ocean Voyaging Model: Bronze Age Scandinavian Example*

Here we describe the implementation of a realistic representation of paddling propulsion on a deterministic ocean voyaging computer model. Due to lack of quantified information on the impact of environmental parameters such as winds and currents on paddling, in a previous version of the model paddling speed is kept constant. Based on direct archaeological data as well as measurements from the Tilia Alsie, a reconstruction of the Scandinavian Bronze Age Hjortspring Boat, nautical architecture software was used to generate estimates of paddling speed as a function of true wind speed and direction, with true wind being a function of vessel bearing. Preliminary simulations using the improved paddling speeds generate significantly more variability in trip duration and average vessel speed, better aligned with information gathered during experimental trips with the Tilia Alsie. Compared to field campaigns, the adoption of naval architecture software was a much simpler and cost-effective strategy for generating the wind dependent paddling speeds. The next steps in model development will include the use of the naval architecture software to generate estimates of how wave height influences vessel stability and paddling speed.

Montenegro, Alvaro [66] see Mullen, Damon

**Montero, Gabriela (University of Kentucky)**

[247]

*On Urban Development and Cultural Heritage: A Perspective from Cholula, Puebla*

The city of Cholula has been occupied for thousands of years. However, the Spanish conquest signified one of the most significant moments of social, political, and cultural change—in part due to the development of the colonial city of Puebla, which was created for Spaniards. Cholula, however, specifically San Andrés, was perceived as an indigenous place. The shadow that remains of this worldview in the present is not always

straightforward, but it has important effects. “Progress” has since been related to urbanization, while everything that stands in the way is an obstacle to modernization. The “Parque de las 7 culturas, rescate y dignificación de la zona arqueológica” was a touristic project that intended, as its title says, to “dignify” the archaeological site of Cholula, which meant that they would build a “modern” park and businesses, displacing local merchants and people whose houses were in the proposed land. In this paper, I analyze what this means for the archaeological community in terms of our role in the public sphere. Additionally, I present a proposal I created in 2016 that would mediate between governmental and public goals. Lastly, I comment on what has changed and what is yet to be achieved.

**Montero, Laurene (Pueblo Grande Museum), Douglas Mitchell (Pueblo Grande Museum), Zachary Rothwell (North Wind Resource Consulting LLC), Stephanie Sherwood (Desert Archaeology Inc.) and Steven Rascona (Pueblo Grande Museum)**

[75]

*P-Map: Digitizing the village of Pueblo Grande*

The prehistoric Hohokam village of Pueblo Grande, in the heart of Phoenix, was established as a City park and museum in 1929. The site includes one of the largest platform mounds in Arizona, a ballcourt (possibly two), thousands of features, and once contained a tower-like structure. Excavations have been conducted at Pueblo Grande since as early as 1901 and continue to the present. To date, over  $\frac{3}{4}$  of this extensive village has been excavated. The Pueblo Grande Village Mapping Project (P-Map) is a modern continuation of the mapping efforts begun by Adolph Bandelier more than a century ago. This project was created to establish a geodatabase structure for the storage and access of Pueblo Grande spatial data. Following development of geodatabase schema, an ESRI file geodatabase was created into which existing project data from the Park and other projects were migrated. P-Map is an exciting example of combining legacy data and modern digital tools to provide research opportunities into prehistoric cultures and ultimately translating this data into museum focused, public education. We will continue to expand our P-Map team with other professionals, including Tribal representatives, and eventually plan to incorporate other Phoenix Hohokam villages into our study.

**Montgomery, Kristopher**

[42]

*A Macroscopic Lithic Analysis of South Mountain Metarhyolite Quarries: A Focus on Intersite and Intrasite Assemblage Comparisons of the Green Cabin Site (36AD0569), South Mountain, Pennsylvania*

Metarhyolite from the South Mountain Section of Pennsylvania has been utilized by indigenous groups in the Middle Atlantic Region since the Archaic period. The resource has been the focus of widespread quarrying activities, spurring an entire Native American complex of quarries, which are restricted to a relatively confined geographic region where metarhyolite forms. Typically, these quarry sites are located on the upper slopes and ridges of South Mountain, near metarhyolite surface outcrops, and display surficial quarry pit depressions. A partnership between Shippensburg University of Pennsylvania and the Indiana University of Pennsylvania began to examine metarhyolite outcrops found on South Mountain. Excavations at the Green Cabin site (36AD0569) were conducted as part of a mini-grant from the South Mountain Partnership. The site is situated on a south-facing concave slope, within a mass movement feature, which is unique for South Mountain metarhyolite quarries. Kristopher Montgomery, a second-year graduate student at IUP, conducted as analysis of lithic artifacts recovered from Green Cabin to discern geologic origin and activity at the site. The research aimed to provide more insight into site function and its relationship to the broader South Mountain quarrying complex.

**Montgomery, Shane (University of Calgary) and Holley Moyes (University of California, Merced)**

[165]

*Lend Me Your Ears: Modeling Traditional Maize Production at Las Cuevas, Belize*

The Las Cuevas region, situated on the southeastern edge of the Vaca Plateau in western Belize, consists of several medium-sized centers dispersed between low hills, steep ridges, and small seasonal swamps. Although

occupied only briefly during the Late Classic period (700–900 CE), aerial lidar and pedestrian survey have revealed a complex network of civic architecture, residential constructions, terraces, and ditched fields. In order to understand past approaches to tropical land use and management in this portion of Mesoamerica, it is necessary to model the productivity and limitations of milpa cultivation strategies on local, regional, and interregional levels. This paper, as part of a comparative effort between multiple research projects across the Maya Lowlands, combines spatial analyses of remotely sensed data with traditional ecological knowledge to examine the relationship between the milpa-cycle, population estimates, and agricultural intensification during the Classic period (250–900 CE) apex of Maya civilization.

Montoya, Fawn-Amber [14] see Larkin, Karin

Monzón, Elvis [82] see Watanave, Aldo

**Moonkham, Piyawit (Washington State University), Andrew Duff (Washington State University) and Nattasit Srinurak (Saga University, Japan)**

**[109]**

*The Heterarchical Life and Spatial Analyses of Historical Buddhist Temples in the Chiang Saen Basin, Northern Thailand*

The concept of social heterarchy was first incorporated as an alternative approach to examining the sociopolitical organization of early settlements in the Southeast Asia region, particularly pre-state societies. However, applications of heterarchy are somewhat limited to archaeological research on social development, sociopolitical organization, and social landscape in Southeast Asian state societies. To expand the applications of heterarchy, we incorporate space syntax and GIS angular and viewshed analyses to understand how sociopolitical organization and interaction were arranged through spatial patterns and organizations of the historical Buddhist temples in the Chiang Saen Basin. This paper demonstrates the complex relationship and interaction between various historical Chiang Saen social groups through the combination of conventional and nonconventional spaces, shared street networks, and visibility across time. We suggest that these apparent spatial characteristics demonstrate the heterarchical form. The heterarchical spatial system refers to the hybrid, diversified, horizontal, and nonhierarchical relationship of spatial patterns that tend to have open accessibility and integrated, symmetrical organization of spaces, and reflect the organic solidarity of communities. The approach discussed here provides a basic understanding of the complex organization among sociopolitical groups of the historical communities in Northern Thailand, emphasizing the co-occurrence of hierarchical and heterarchical forms of governance.

**Moore, James**

**[112]**

*Wari D-Temples: Inferring Function from Shape, Distribution, and Orientation*

Emerging evidence increasingly suggests that D-shaped structures were a tool of Wari imperial and cultural expansion throughout the Middle Horizon landscape. Analysis of their construction, geographic distribution, regional context, and specific orientations reveals that their use and purpose was not monolithic, and that researchers should not view them as such. The D-shape itself appears to have been significant, yet structures that incorporate it were varied in their use and included functions such as temples, huacas, mausoleums, administrative centers, and observatories. The pattern of their geographic distribution and prevailing use-types in areas beyond the Wari homeland in the Ayacucho Valley infers a deliberate imperial project predicated on securing access to resources while enculturating and incorporating local populations.

**Moore, Jerry (CSU Dominguez Hills)**

**[164]**

*Discussant*

**Moore, Katherine (University of Pennsylvania), Chantel White (University of Pennsylvania), Marie-Claude Boileau (University of Pennsylvania), Jason Herrmann (University of Pennsylvania) and Vanessa Workman (University of Pennsylvania)**

[211]

*Hands-On Learning Applications in University Archaeological Science Courses*

Material evidence is the hallmark of archaeological investigations, but bringing the reality of actual materials to the classroom can be challenging. We observe that the multisensory impact of hands-on activities in the classroom conveys key information and is a valuable way to engage students at the first-year, advanced undergraduate and graduate levels. In our CAAM archaeological science courses, we employ four structured categories of hands-on learning: (1) skills-based learning, in which students learn proper lab methods and equipment use; (2) experiential learning, in which students become familiar with important raw materials and their transformation; (3) experimental archaeology, in which students make systematic observations under controlled circumstances to test hypotheses; and (4) object-based learning, in which students work with archaeological artifacts to make original observations. Offering scaffolded experiences from the earliest levels of coursework allows students to prepare for increasingly demanding interpretive tasks as archaeologists, and highlights aspects of archaeological techniques and methods of inquiry that may be applied to other fields of research.

Moore, Katherine [74] see Milton, Emily

Moore, Kaylyn [136] see Pitblado, Bonnie

Moore, Mark [232] see Ferar, Nolan

Moos, Elena [232] see Ferar, Nolan

Mora, Christian [196] see Saldana, Melanie

Moraes, Claide de Paula [235] see Prestes Carneiro, Gabriela

**Moragas, Natalia (University of Barcelona), Maria Torras Freixa (Postdoctoral Gerda Henkel Fellowship) and Alessandra Pecci (University of Barcelona)**

[25]

*“Las tomas de posesion”: A Useful Instrument to Understand Early Colonial Archaeological Landscape in the Teotihuacan Valley*

Much of the knowledge on Teotihuacan and its surroundings has been produced almost exclusively through archaeology as the main discipline. These archaeological studies have focused mainly on Teotihuacan during the Classic period. However, it must be considered that the population of the Teotihuacan Valley did not begin and end with the classical city of Teotihuacan, but rather its occupation continues until today. There is not recent interdisciplinary research on colonial archaeology in the Teotihuacan Valley. This paper presents the first steps in an interdisciplinary investigation of landscape change in the Teotihuacan Valley during the early colonial period. In this sense, we explore the possibility of using the documentation known as “tomas de posesión.” These “tomas de posesión” were part of the entire ritual that took place at the time a cacique took possession of his land after the death of his predecessor. This administrative documentation provides descriptions of lands but also of the remains of abandoned buildings. Looking at these documents with an archaeological approach allows us a better understanding of the abandonment of Teotihuacan in Postclassic to early colonial times.

Moragas, Natalia [189] see Torras Freixa, Maria

Morales, Ana Maria [237] see Gutierrez, Jonathan

Morales, Pedro [20] see Somerville, Andrew

**Morales Forte, Rubén (Tulane University) and Maxime Lamoureux-St-Hilaire (Mount Royal University, Calgary)**

[106]

*Slow Archaeology, Community Engagement, and Collaborative Knowledge Production in the Maya World*

Archaeological endeavors around the world have begun to emphasize ethical project design and community engagement. Several projects in Latin America are adopting Community-Based Participatory Research (CBPR) but the pace of adoption of recommendations from the Indigenous Critique and Black Feminist Anthropology remains slow. Parachute archaeology is still common in the Maya world, following the traditional colonialist archaeology model of the twentieth century. In this article, we address practices that can make Maya archaeology more respectful, focusing on sustainable projects designed with, for, and by local, Indigenous, and descendant communities. We advocate for slow archaeology, which adopts a progressive and dialogical approach to project design, excavations, and the collaborative production of knowledge. We showcase this approach with the preliminary phase of our integral anthropological project in Dolores, Petén, Guatemala. For years, Doloreños have excelled as archaeological workers on dozens of site projects. Such experience positions Dolores as an outstanding candidate for a CBPR project that can bridge the gap between academic and field crews and capitalize on the vast archaeological knowledge of its community. Our prospective project will provide an opportunity for workers to participate beyond the excavations, in the project design, and in the subsequent production of archaeological knowledge.

Morales Guillen, Arlina [9] see Ortiz Brito, Alberto

**Mora-Marin, David (University of North Carolina)**

[80]

*Chair*

**Mora-Marin, David (University of North Carolina)**

[80]

*Mayan Spelling Conventions: Late Preclassic through Late Classic*

This paper deals with the topic that inspired me to study with John Justeson: it traces the major spelling practices of Mayan writing from the Late Preclassic through the Late Classic periods. It employs the evidence from Late Preclassic and Early Classic inscriptions, some of which I have documented myself, as well as the Maya Hieroglyphic Database (Looper and Macri 1991–2022) to evaluate the evolution of spellings strategies of major word classes (nouns and verbs). The paper proposes that the basic spelling principles evolved to satisfy the concerns of disambiguation (for the readers) and economy (for the writer). It is shown that logograms for nouns and verbs corresponded to abstract lexemes, not roots or stems, and that the basic spelling principles evolved not only to disambiguate between possible inflectional and derivational shapes, but also to minimize the number of graphemes needed in such task. It is also shown that word-closing phonographic spellings, whether synharmonic or disharmonic, were constrained by phonological conditions of consonants or whole syllables, or employed to indicate the presence or absence of suffixes, and not by the so-called complexity of vowels. Over time, such disambiguation became more systematic, but a tendency toward minimization was largely maintained.

Moran, Thomas [165] see Shi, Stone

**Morell-Hart, Shanti (McMaster University)****[223]***Tubers, Grain, and Everything In Between: Mesoamerican Applications of Dolores Piperno's Research*

Over the past several decades, Dolores Piperno has made broad contributions to archaeology and deep contributions to paleoethnobotany. Her published work includes studies on the origins of agriculture in the Neotropics, the presence of cooked plants in Neanderthal diets, the process of domestication, the use of wild cereals in the Upper Paleolithic, the use of horticulture in Central America, the anthropogenic changes in vegetation at Amazonian sites, and the dispersals of various cultigens including chiles, squashes, rice, and root and tuber crops. Her methodological advancements and historical reconstructions have made their way into a network of researchers spanning six continents and several academic generations. In the first part of this paper, I track the impacts of Piperno's research across various fields, including her collaborations with paleoanthropologists, soil scientists, historians, and geneticists. In the second part of the paper, I focus on Piperno's work with food residues, describing some of my own findings from microbotanical analyses in southeastern Mesoamerica. The analysis of microbotanical residues has revealed a world of plant use—including roots and tubers—usually invisible through other means. Such studies are transforming the way we think about agricultural practice and relationships with the landscape—as well as ancient cuisine.

Morett-Alatorre, Luis [54] see Cordova, Carlos

**Morgan, Christopher (University of Nevada, Reno)****[235]***High-Altitude Settlement as Evolutionary Process in Mid-Latitude North and South America*

Despite many similarities, aboriginal high-altitude occupations in the middle latitudes of North and South America differ in several ways. This paper compares and contrasts the behaviors that have been reconstructed in these locales and explores the principal drivers of high-altitude intensification—population pressure, climate change, and social dynamics—that most plausibly explain these occupations. It then synthesizes this information as a means of developing a general theory explaining high-altitude land use from an evolutionary perspective.

**Moriarty, Ellen (Castleton University), Jaron Rochon (Castleton University), Samantha LaPlante (Castleton University), Emery Benoit (Castleton University) and Michael Angers (Castleton University)****[181]***The Granger House Project: Community Outreach and Public Archaeology in Castleton, Vermont*

Community outreach has played a major role in the Castleton Hidden History Project, which highlights a diverse and inclusive history of the Castleton, VT area from the end of the ice age through the present day. Grounded in interdisciplinary research and public participation, current archaeological work centers on Granger House, a historically significant nineteenth-century home in the village of Castleton, VT. Since 2019, more than 300 adult and youth volunteers, ranging in age from 5 to 75, have participated in excavations around the house, and many more have interacted with the project through school and community presentations. This poster will present innovative outreach methodologies including the use of 3D and virtual reality technologies, together with the results of volunteer surveys designed to capture takeaways from the experience. Collectively, surveys reflect that public participation provides new knowledge of the scientific methods of archaeology, creates tangible connections to local history, and fosters an understanding of why that history is important to study and protect.

**Moriarty, Matthew (Castleton University), Joseph Kinney (Castleton University), Luke Kosby (Castleton University), Philip Williams (Castleton University) and Noah DiStefano (Castleton University)****[181]***The Granger House Project: Archaeology, History, and the Creation of a Community Museum in Castleton, Vermont*

The Castleton Hidden History Project was established in 2021 to highlight a diverse and inclusive history of the town of Castleton, VT through interdisciplinary historical, archaeological, and geographic research. Investigations to date have focused on Granger House, a well-preserved nineteenth-century home in Castleton Village and in the heart of the Castleton University campus, with the goal of making the house both an interactive museum of local history and a center for experiential learning. Since the project's inception, work has emphasized undergraduate engagement through integrated coursework, paid internships, and participation in all aspects of research and museum planning. These efforts culminated in summer 2022 with a monthlong sponsored-research residency for 25 undergraduate students from across the Vermont State Colleges. Student interns collaborated in archaeological excavations, archival research, 3D imaging, architectural studies, artifact analyses, and museum planning. This poster presents the early results of these investigations and highlights the ways in which local, collaborative research can strengthen curricula, support student engagement, and produce high-quality results.

**Morin, Eugene (Trent University), Gilbert Tostevin (University of Minnesota), Gilliane Monnier (University of Minnesota) and Michael Buckley (Manchester Institute of Biotechnology)**

**[240]**

*New Insights on Neanderthal Subsistence Strategies in Central Europe Using Faunal and ZooMS Analyses at Crvena Stijena*

While considerable research on Middle and Late Pleistocene subsistence has been conducted in Western Europe, little is known about variation in the hunting abilities and dietary behavior of Neanderthal populations in Central Europe. Here, we present new faunal results from Crvena Stijena that draw on standard archaeozoological methods as well as more recent approaches—including zooarchaeology by mass spectrometry (ZooMS)—that cast additional light on Neanderthal diet and food procurement methods in the Balkans. In addition to showing relatively good agreement between the two sets of approaches, our results convey new insights on the range of animals that were exploited, their use as food, and how some of them were manipulated in contexts likely associated with symbolic signaling.

Morin, Eugene [240] see Bao, Yige

Morin, Eugene [118] see MacMillan, Alison

Morin, Eugene [97] see Winterhalder, Bruce

**Morris, Adela and Lynne Engelbert (Institute for Canine Forensics)**

**[174]**

*Historical Human Remains Detection Dogs: A Unique Tool for Native American Communities*

The use of trained Historical Human Remains Detection dogs (HHRDs) is a noninvasive technique that can help locate burials, providing less destructive archaeological survey alternatives to the Native American Community. HHRDs can identify historical and precontact burial areas, so construction or other kinds of invasive activities can be avoided or redirected around sensitive areas. The dog's ability to detect scent is a unique tool in a multidisciplinary approach to better reach a common goal. The California Environmental Quality Act, Tribal Consultation (AB 52-CEQA) is a California law that requires public agencies to consult with tribes when it may impact a known Native American cultural area. Many tribes are requesting trained HHRDs to be part of the initial survey when burials are a possibility. The Institute for Canine Forensics (ICF) has worked with tribes over 20 years to build trust and gain a better understanding of their cultural beliefs and offer possible solutions. We will discuss a case where a multidisciplinary approach was taken, and the overwhelming evidence provided by the combined methods allowed the landowner and tribe to reach an informed decision.

**Morrison, Alex (International Archaeological Research Institute), Timothy Rieth (International Archaeological Research Institute) and Anthony Dosseto (University of Wollongong Isotope Geochronology Lab)**

[207]

*Methodological Considerations for Modeling the Temporal Characteristics of Hawaiian Architecture: An Example from Kekaha Kai, North Kona*

In this presentation we build on Tom Dye's pioneering approach to modeling the temporal parameters of Hawaiian architecture with an example from Kekaha Kai, North Kona, where he conducted archaeological investigations nearly two decades ago. We report a suite of uranium-thorium dates acquired from coral offerings recovered across the surface of a ritual structure (*heiau*) and the natural source environment of the corals, the foreshore. Our approach is influenced by transport and depositional models used by coastal geomorphologists when dating the development of coastal landforms. We evaluate the degree to which seemingly pristine fragments of coral harvested from the source environment contain inbuilt age. We classify environmental corals according to water worn erosional characteristics and provide precise temporal estimates for each sample. These analytical methods are then applied to dozens of coral samples collected from the surface of the ritual structure. The results indicate that the acquisition of suites of coral dates is necessary to gain a full understanding of the temporal range of ritual structures in Hawaii and that archaeologists should consider both the erosional condition of the archaeological samples and the relationship between the age and condition of coral samples in the source environment.

Morrison, Alex [74] see Wathen, Kelli

**Morrow, Giles (Vanderbilt University)**

[95]

*Chair*

**Morrow, Giles (Vanderbilt University), Jesse Spencer-Smith (Vanderbilt University), Yuechen Yang (Vanderbilt University) and Mubarak Ganiyu (Vanderbilt University)**

[95]

*Digital Connoisseurship: Applications of Machine Learning to Moche Iconography*

In the absence of a written language, the study of the complex narrative iconography of the Moche or Mochica culture of the North Coast of Peru (250–900 CE) forms an important foundation of our understanding of the cultural dynamics and ritual traditions of this precolumbian society. Fineline iconography on Moche ceramic vessels in museum and private collections in Peru and around the world continue to be the focus of considerable scholarship. However, in most archaeological contexts, only fragments of these vessels are found, allowing for an extremely partial understanding of the complete iconography of the original artifact. The process of assigning a fragment to a particular iconographic scene is entirely dependent on a researcher's exposure to the artistic corpus, their "connoisseurship" or expert knowledge. The current project has developed machine learning techniques to assist in the recognition of iconographic scenes from fragmentary elements. An initial challenge involved creating an algorithm that "breaks" or "shatters" reference images into fragments for use in training a self-supervised deep learning system. Following training, an image of a novel fragment can be introduced to the system and assigned to a particular complete iconographic scenes with various degrees of confidence.

**Morrow, Juliet (Arkansas Archeological Survey)**

[171]

*Analysis of Debitage from an Intentionally Burned House at the Greenbrier Site (3IN1), a Late Mississippian Town in the White River Valley of Arkansas*

Located at the eastern edge of the Ozarks, the Greenbrier site is in a unique ecotonal location in close proximity to a diversity of lithic resources in the middle White River Basin. Ceramics at Greenbrier indicate that people here were closely connected to towns on the upper and lower White River and also to occupants in the Parkin, Nodena, and SE Missouri culture areas. Recent gradiometry of the central portion of

the site shows a plaza and a palisade or enclosure that was rebuilt at least once to accommodate an expanding population. Approximately 75 houses, some of which were possibly rebuilt, are visible in gradiometry images covering about one-third of the site. This presentation will focus on the natural and cultural formation processes of a single large (approximately 6 × 6 m) intentionally burned house through analysis of debitage. How connected this village is to those upstream, downstream, and across the Central Mississippi Valley, defined by Dan and Phyllis Morse (1983), is the long-term goal of our larger research project at the Greenbrier site.

Morton, Shawn [115] see Peuramaki-Brown, Meaghan

Moses, Steven [37] see Taylor, Amanda

Moses, Victoria [118] see Motta, Laura

Mosqueda-Lucas, Gina [10] see Brown, Kaitlin

Mosqueda-Lucas, Gina [99] see Sunell, Scott

**Moss, Madonna (University of Oregon), Eleni Petrou (USGS), Camilla Speller (University of British Columbia), Dongya Yang (Simon Fraser University) and Lorenz Hauser (University of Washington)**

**[218]**

*The Archaeology of Herring: A 10-Year Effort to Overcome Technical Challenges, Part I*

Alaska Natives and BC and Washington State First Nations have maintained sustainable relationships with herring over millennia. Over the past 10 years, we have been using molecular methods to study the ancient and modern DNA of Pacific herring to track changes in genetic diversity through time. Analysis of over 260 herring bones from 24 archaeological sites ranging from Puget Sound to Alaska shows that mitochondrial DNA is extremely well preserved for at least the last 2,400 years. Unfortunately, this locus is not informative for discriminating subregional populations of herring. As a result, we shifted from studying mitochondrial DNA to nuclear DNA. First, we had to build a regional database of modern Pacific herring against which to compare the ancient herring. For the modern herring, laboratory protocols were developed to remove intraspecific contamination and identify informative single nucleotide polymorphisms (SNPs) through restriction site-associated (RAD) sequencing. Most recently, we are exploring the use of hybridization capture and whole genome sequencing to track changes in population diversity and size at archaeological sites in Alaska and Washington state. Over the last decade, our tactics have evolved along with DNA technology itself, as well as the research questions we aim to address.

Moss, Madonna [218] see Speller, Camilla

Motes, Grace [181] see Blondin, Émilie

**Motta, Laura (University of Michigan), Victoria Moses (University of Arizona), Jason Kirk (University of Arizona), Lael Vetter (University of Arizona) and Jay Stephens (University of Missouri)**

**[118]**

*Livestock Economy and the Emergence of Urbanism in Central Italy during the Iron Age and Archaic Period*

This paper discusses subsistence specialization, livestock mobility, and husbandry strategies at Gabii during the eighth–fifth centuries BCE, a time of transition to state-level, urbanized political systems. The site of Gabii is one of several emerging cities in the Lower Tiber Valley that grew along a similar trajectory, expanding from dispersed hut clusters to a nucleated urban center. This process has long been linked to increased

intensification of food production and specialized economies necessary to sustain demographic growth. Zooarchaeological evidence at Gabii instead indicates continuity of animal rearing practices and the persistence of household-level economies. Isotopic analysis ( $^{87}\text{Sr}/^{86}\text{Sr}$ ,  $^{13}\text{C}$ ,  $^{18}\text{O}$ ) of cattle, sheep/goat, and pig teeth reveals diverse management strategies, seasonal sheltering, and differential seasonal feeding practices. Cattle were likely offered fodder and well water but ovicaprine livestock's diet and water source shifted seasonally. While long-distance transhumance and vertical herd mobility is attested for later periods, Gabii's animals were raised nearby during all seasons. These rearing choices reflect food production, social practices, and the role of mobility during a period of social and economic change, offering new insights into how early urban centers in the region adapted with important implications for global discussions of urban development.

**Moubtahij, Zineb (MPI-EVA/GET-CNRS), Benjamin Fuller (Géosciences Environnement Toulouse), Adeline Le Cabec (Université de Bordeaux) and Klervia Jaouen (Géosciences Environnement Toulouse)**

**[252]**

*Multi-isotopic Investigation of Late Pleistocene Human Diet from the Site of Tatoralt, Morocco*

The Paleolithic to Neolithic transition generally denotes a dietary change from hunting, gathering, and fishing to agriculture. However, due to the limited number of Pleistocene sites that have yielded preserved human remains, our knowledge of the diets of pre-agriculturist human populations is still limited. Previously published isotopic studies have mainly focused on European sites where the environmental conditions allowed collagen preservation. The unique site of Tatoralt in Morocco, associated with the Iberomaurusian culture, has yielded what is known as the largest and oldest cemeteries in North Africa, dating to the Late Pleistocene period (15,100–13,900 years BP). Evidence of intense plant use, early sedentarism, and a high prevalence of tooth caries and disease linked with a newly adopted mode of subsistence was found at Tatoralt. Here, we conduct a detailed investigation of the subsistence strategies of this population through a multi-isotope study on bone collagen and dental enamel from humans and animals using traditional bulk collagen  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$ ,  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  of amino acids,  $^{87}/^{86}\text{Sr}$  and nontraditional  $\delta^{66}\text{Zn}$  isotopes of hydroxyapatite. These results reveal new information and a much clearer picture of the dietary practices of Late Pleistocene humans in North Africa.

Moubtahij, Zineb [252] see Jaouen, Klervia

Moussous, Abdelkader [87] see Rossoni-Notter, Elena

**Moyer, Teresa**

**[38]**

*Moderator*

**Moyes, Holley (University of California, Merced) and Dominique Rissolo (Qualcomm Institute, University of California)**

**[81]**

*Slam Dunk: 3D Imaging in Belizean Cave Sites Using Hovermap System*

Mapping is one of the most fundamental and important enterprises for cave archaeologists not only for research but also integral to cave management and heritage preservation. Using traditional cartography techniques is often a tedious and long-term project involving numerous field seasons and thousands of measurements. Capturing 3D spaces using these 2D techniques is clunky and often unsatisfying when recording features or chambers that overlap vertically. Due to the complexity of the spaces, accuracy is often sacrificed in the interest of time and traditionally cave features are “sketched” even in the best-case scenarios when measurements are collected from stations or physical baselines. New technologies allow archaeologists to collect 3D spatial data on these highly complex spaces rapidly at an unprecedented level of accuracy. We

illustrate an advancement in methodology using field testing of the Hovermap system employing case studies from Belize. Designed for the mining industry, Hovermap is a turnkey lidar system that combines drones—using SLAM navigation paired with sophisticated autonomy and collision-avoidance capability—with a handheld mode. We were able to rapidly capture data from four caves within a two-week period. Once postprocessed, these data allowed us to create both 3D images for fly-throughs as well as 2D maps.

Moyes, Holley [165] see Montgomery, Shane

**Mudar, Karen (National Park Service)**

[231]

*Moderator*

[231]

*Discussant*

Mueller, Johannes [14] see Biehl, Peter

Mueller, Natalie [111] see Belcher, Megan

Mueller, Raymond [127] see Perry, Gabrielle

**Mullen, Damon (Ohio State; University Kent State University; University of Akron), Karl Reinhard (University of Nebraska, Lincoln), Alvaro Montenegro (Ohio State University) and John Hawdon (George Washington University)**

[66]

*Prehistoric Hookworm and the Peopling of the Americas: Enhancing Theories Based on Paleoclimate Models and Pathogens*

Humans brought many things with them when they came to the Americas. This study focuses on hookworms and domesticated dogs to revise, constrain, or enhance theoretical models of when and how humans first came to the Americas. The hookworm life cycle is critically dependent upon the environmental conditions and proximity to suitable hosts. Its eggs leave the host's body through feces, burrowing into the soil and spending several days before it can reinfect a host through barefoot contact with the infected ground. This life cycle creates climatic restrictions on where, when, and how people could reach the Americas while supporting the reinfection of the temperature-dependent parasites. In this study, we used paleoclimate models to look for land-based environments that would enable hookworm transmission into the Americas. Our results show that conditions in Beringia did not support an ongoing hookworm infection for moving through or living within it during currently accepted theoretical timeframes of migration and stasis.

**Mullins, Patrick (University of Pittsburgh), Brendon Murray (Columbia University), William Feltz (University of Illinois, Chicago), Matthew Ballance (Brown University) and Brian Billman (University of North Carolina at Chapel Hill)**

[69]

*Integrating Aerial Kite and Drone Imagery into the Moche Valley Settlement Database (MVSD)*

This poster presents the results of five seasons (2015, 2016, 2017, 2018, 2022) of aerial kite and drone imagery from the Moche Valley and the integration of these data into the Moche Valley Settlement Database (MVSD). The MVSD is a collaborative initiative that is synthesizing prehistoric (~10,000 BCE–1500s CE) and viceroyalty-era (1500s–1800s CE) settlement patterns in the Moche Valley of Peru from a variety of sources ranging from legacy and modern archaeological surveys to historical maps and census data. Working under

the nonprofit Mobilizing Opportunity through Community Heritage Empowerment (MOCHE Inc.) and the Proyecto Arqueológico Reconocimiento de la Frontera Alto Moche (PARFAM), the authors collected aerial imagery data using a variety of platforms over a period of seven years. The resulting imagery was refined to produce over 110 sets of Digital Elevation Models (DEMs) and Orthophotos that record hundreds of archaeological sites and features—everything from monumental adobe huaca mounds to elaborate hilltop fortresses—in the Moche Valley. These data were then integrated into the larger MVSD where they have been used to better understand Indigenous settlement histories in the region as well as modern patterns of site preservation and destruction.

Mundorf, Amy [203] see Janzen, Anneke

Munita, Casimiro [148] see Batalla, Arlys Nicolás

**Munley, Cameron and Michelle LeFebvre (Florida Museum of Natural History)**  
[76]

*A Zooarchaeological Meta-analysis of Ceramic Age Marine Fish Harvesting across the Caribbean Archipelago: Generating Baselines for Assessing “Stability”*

Zooarchaeological baselines of human-animal engagements and their outcomes are increasingly critical to modeling what community stability looked like in the past and what we can learn from it today. Concomitantly, zooarchaeological baselines also provide critical measures of biodiversity distribution, loss, or persistence through time for use in conservation. Here, we share the initial results from an ongoing meta-analysis of marine fish harvest across the Caribbean Archipelago, a renowned biocultural diversity hotspot, during the Ceramic Age (~500 BC–AD 1500). We present the first synthetic baseline of marine fish taxonomic diversity and harvest trends across 34 islands, 75 sites, and approximately 182,000 NISP. Our results indicate definite trends in marine fish harvest, while also highlighting critical gaps in data needed to better render as chronologically, geographically, and taxonomically holistic as possible zooarchaeological perspectives of marine vertebrate subsistence stability (or not) through time. More broadly, these data provide a foundation from which to assess differential archaeological interpretations of Ceramic Age community sustainability (via vertebrate subsistence patterns) and develop intraregional hypotheses addressing diachronic, multiscale patterns of socioecological resilience.

Muñoz, Marissa [149] see Razo, Mikaela

Muñoz Cosme, Gaspar [11] see Vidal-Lorenzo, Cristina

**Munro, Kimberly (Otero College)**  
[123]

*The Road to Rayan Is Paved with Good Intentions*

Throughout the 1970s and 1980s, Wilfredo Gambini, the then mayor of the Caceres District (upper Nepeña River Valley) Ancash, Peru, encouraged local campesinos to bring him any artifacts that were found in their local hamlets for his private collecting. From these interactions he compiled a database of archaeological complexes for the region, despite only visiting a small percentage of centers in person. Gambini paid special attention to the area surrounding the village of Rayan. Ceramics from this area can be traced mostly to the Early Intermediate period, specifically to the Recuay culture. Gambini believed the origin of many of the complete ceramic vessels came from a multistoried Chullpa known as “el Castillo.” Survey work and interviews with local community members conducted in 2016, 2019, and 2022 however have revealed a number of additional sites surrounding Rayan, including a clustering of smaller chullpa, a domestic ridge

complex, and at least two hilltop mounds. This poster presents on the archaeological vestiges documented during the 2016–2022 survey, and the presence of “Recuay” groups in the upper Nepeña River Valley, expanding on Gambini’s original theories on the provenance of the ceramic vessels which are now part of the Gambini private collection.

**Munro, Natalie (University of Connecticut)**

[97]

*Behavioral Ecology and the Emergence of Sedentism and Agriculture*

More than a decade after Niche Construction Theory was proposed as an alternative to behavioral ecological models in the study of agricultural origins, many misconceptions about behavioral ecology and its contribution to the study of the emergence of sedentism and agriculture remain. Here, I address some of these misconceptions and consider some new ideas and explanations that have entered the literature over the past 10 years through a behavioral ecological lens. In particular, I unpack the use of the term “opportunism,” that humans settled down because resources were plentiful, in explanations of sedentism. In doing so, I discuss topics such as progressivism, agency, and niche construction, and highlight the power of fundamental concepts from the prey, patch, and ideal free distribution models to explain the conditions under which sedentism and, ultimately, early agricultural communities emerged.

**Munson, Jessica (Lycoming College)**

[142]

*Chair*

**Munson, Jessica (Lycoming College), Andrés Mejía Ramón (Okinawa Institute of Science and Technology), Lorena Paiz (Proyecto Arqueológico Altar de Sacrificios), Jill Onken (University of Arizona) and Jonathan Scholnick (Bucknell University)**

[142]

*Settlement Density, Household Inequality, and Social Interaction in the Western Maya Lowlands*

Decades of settlement pattern research in the Maya lowlands has produced unparalleled datasets for studying processes of urbanization in tropical landscapes. Recent comparative studies support a view of ancient Maya cities as low-density urban systems, which may have created different opportunities for social interaction and economic mobility in contrast to other urban systems. This paper examines the relationship between settlement density, household inequality, and social interaction at multiple spatial scales to reconsider past experiences of energized crowding and its consequences for ancient Maya society. Altar de Sacrificios is an ancient Maya city located at the confluence of the Pasión and Salinas Rivers along the modern Guatemala-Mexico border. Recent UAS survey of this 50 km<sup>2</sup> region has documented a dispersed, low-density settlement comprised of many residential groups aligned with relic river channels. Settlement pattern data collected by the Proyecto Arqueológico Altar de Sacrificios (PAALS) are used to generate comparative measures of household wealth to assess whether access to specific infrastructural and agricultural resources is economically advantageous for Late Classic period (ca. 600–800 CE) inhabitants. Results of this work directly contribute to the goals of the collaborative GINI Project and provide important insights about urbanization processes in tropical environments.

Munson, Jessica [165] see Mejía Ramón, Andrés

Munson, Jessica [123] see Onken, Jill

**Murakami, Tatsuya (Tulane University)**

[83]

*Discussant*

Murphy, Eileen [45] see Pytleski, Hannah

Murphy, Gabriela [102] see Marshall, Aubree

**Murphy, Melissa (University of Wyoming)**

[110]

*Moderator*

**Murray, Brendon (Columbia University)**

[123]

*Land Use at the Necks of the Moche and Virú Valleys on the North Coast of Peru*

This poster discusses preliminary dissertation fieldwork at Cerro Oreja and Galindo in the Moche Valley and Castillo de Tomaval in the Virú Valley. These sites were chosen for their location at the neck of each valley and their heavy occupations during the Early Intermediate period (ca. 1 CE–ca. 800 CE). This location serves as an inflection point between the lower and middle valleys. Cerro Oreja's primary occupation was during Gallinazo and Moche, but there is a later Chimú occupation at the peak. Castillo de Tomaval consists of an adobe structure and Virú and Moche occupations at the base of a ridge, as well as earlier architecture exists overlooking the castillo. Galindo was a Late Moche urban center with domestic and monumental architecture on the valley floor and the slopes of adjacent mountains. Galindo was mapped in 2017 while Cerro Oreja and Castillo de Tomaval were mapped in 2022. This fieldwork yielded orthophotos and DEMs for each site. Geospatial analyses such as viewshed, hydrology, and catchment analyses were conducted for each site and its surrounding landscape to determine similarities and differences between the two roughly contemporaneous sites (Oreja and Tomaval) and the two Moche sites (Oreja and Galindo).

Murray, Brendon [69] see Mullins, Patrick

**Murray, John (Arizona State University, Institute of Human Origins)**

[66]

*Chair*

**Murray, John (Arizona State University, Institute of Human Origins), Jacob Harris (University of California, Los Angeles), Andrew Zipkin (Eurofins EAG Laboratories), Nicolas Hansen (Arizona State University) and Bailey Goodling (Arizona State University)**

[66]

*Silcrete Heat Treatment Technology during the MIS 5/4 Transition at Pinnacle Point 5–6 and Vleesbaai, South Africa*

The heat treatment of silcrete is an important technological strategy during the Middle Stone Age (MSA) in South Africa. Heat-treating silcrete improves its quality for tool making and use. Although it is found as early as ~162,000 years ago (ka) at Pinnacle Point 13B, heat-treated silcrete does not become common in South African MSA assemblages until around 70 ka. This increase in silcrete use corresponds with the transition from the interglacial Marine Isotope Stage (MIS) 5 to the moderate glacial period of MIS 4. Here, we aim to better understand silcrete heat treatment technology during the MIS 5/4 transition (~80–70ka) at two coastal MSA archaeological sites: Pinnacle Point 5–6 and Vleesbaai. We use a multiproxy approach that includes qualitative observations, the surface roughness method, and quantitative color measurements to elucidate patterns in heat-treated silcrete over time. We then contextualize these data within the broader paleoenvironmental, paleoecological, and technological setting of the MIS 5/4 transition on the south coast of South Africa. More specifically, we investigate how the contraction and expansion of the now-submerged Paleo-Agulhas Plain may have influenced the use of heat-treated silcrete during this period of global climatic change.

Murray, John [41] see Goodling, Bailey

Murray, John [41] see Huang, Cindy Hsin-yee

Murray, Sarah [24] see Leppard, Thomas

**Musser-Lopez, Ruth (Archaeological Heritage Association Inc. [AHA])**

**[55]**

*Hot Spots of Cobblestone Tool Reduction Incidents and Potential Chronological Staging of the Technology along California's Lower Colorado River Shorelines*

Spatial autocorrelation software for the Moran I statistic in ArcGIS v10.6 was used to combine archaeological site location data with "intensity" or weight defined by the number of artifacts in each of the 280 loci contained within an 80-acre portion of CA-SBr-1456 along the California side of the Lower Colorado River. That data was then processed to create a spatial weight matrix to determine any nonrandom distribution of similar loci defined by types of prehistoric features and artifacts, 254 of which represent one of four stone tool manufacturing technologies, likely from different time periods. The "Local Moran's I" (Anselin et al. 1996) cluster and outlier analytic tool was then applied to determine any existence of "hot spots" or clusters. The analysis revealed clustering of cobblestone tool reduction remains that may be used to define site boundaries and that also revealed a patterned distribution of this prehistoric technology. The observed patterning hints at chronological staging on various benchmarks of the river shoreline. The findings are limited by the project acreage; future studies/assessments involving similar analysis could build evidence and a chronology of Paleocoastal human expansion into North American's interior via the Colorado River.

**Myerscough, Autumn**

**[99]**

*Reflections on My First Summer of Fieldwork*

While what can be learned in a classroom is important, putting skills to use and testing one's abilities in the field helps growth and understanding of archaeology on a different level. This year I was fortunate to get my first job in archaeology. I worked with the Umatilla National Forest out of the Pomeroy Ranger District to survey and reevaluate sites following the Lick Creek Wildfire, which burned roughly 80,000 acres. Before this opportunity, I had taken archaeology and anthropology classes (lectures and labs), which gave me a decent understanding of archaeology and its basic concepts. Fieldwork improved my understanding of how and why we do archaeology.

Myerscough, Autumn [234] see Marquardt, William

Nadachowski, Adam [206] see Talamo, Sagra

**Nadel, Samantha (Boston University)**

**[232]**

*A Reconstructed Chaîne Opératoire for Mesoamerican Cochineal*

The interdisciplinary study of cochineal production in Mesoamerica has overwhelmingly focused on the written record. These documents, written by Spanish colonizers, European scientists, and modern-day ethnographers, yield insightful information into the material culture of cochineal production, from the cactus farm to the dye vat. Yet thus far, this information has not been used to generate hypotheses that can be tested by archaeological materials. This has limited archaeology's contributions to cochineal studies, perpetuating a reliance on documents that often reflect biased and ethnocentric perspectives about Indigenous cochineal producers. In this paper, I draw from historical, ethnographic, and chemical information to reconstruct the stages of cochineal production. For each stage, I identify its associated artifacts, ecofacts, and features, as well as any modifications they may undergo in the process. I pair this analysis with preliminary experimental archaeology findings that suggest the utility of using carminic acid residues to positively identify artifacts modified by cochineal production. I then demonstrate how this approach can be used to test claims about cochineal production, including the antiquity of cochineal use in Mesoamerica, shifts

in European demand for different cochineal products, and the reasons behind the decline in central Mexican production in the mid-1600s.

Nagaoka, Lisa [218] see Gilmore, Eric

Nakatsuka, Nathan [22] see Bongers, Jacob

Nalewaik, Alex [98] see Gonzalez-Tennant, Edward

**Napora, Katharine (Florida Atlantic University), Kristine Schenk (University of Georgia Laboratory of Archaeology) and Chris Saunders (University of Georgia Laboratory of Archaeology)**

[116]

*Teaching Tree Rings: Dendroarchaeology for Outreach and Education*

Dendroarchaeology, the use of tree-ring analyses to understand past human societies, is an excellent subfield by which to introduce students and the public to archaeological science because of its accessibility: trees are a visible part of many peoples' daily lives, and people often have basic knowledge of tree growth that can be drawn on to introduce the archaeological applications of tree rings. Dendroarchaeology also provides a useful introduction to human-environment interaction that emphasizes the interconnectedness of human societies and the natural world—particularly vital in this period of rapid climate change. Here, we discuss the successful methods we have developed for teaching hands-on dendroarchaeology-centered activities for elementary, middle school, and university classrooms as well as for public outreach events.

Napora, Katharine [74] see Hadden, Carla

**Nash, Brendan (University of Michigan), John O'Shea (University of Michigan) and Ashley Lemke (University of Texas, Arlington)**

[197]

*The South Gap Site: A 9,000-Year-Old Submerged Hunting Site in Lake Huron with Far-Reaching Connections*

The South Gap site is at a depth of 105 feet beneath Lake Huron on a submerged landscape referred to as the Alpena Amberly Ridge (AAR). Once exposed as dry land between 11,000 and 8000 cal BP, the AAR provided a causeway for migrating animals, such as caribou, to cross the Lake Huron basin. The landform also served as a natural bottleneck channeling animals to a predictable location where human hunters set up stone drive lines to facilitate a successful hunt. Sonar imaging of the site reveals a series of three V-shaped hunting blinds spaced alongside a north and south running esker. Intriguingly, two obsidian flakes that source to central Oregon were found in between two of the stone blinds. The flakes are relatively small and represent refurbishment of a highly curated biface. That these flakes sourced more than 4,000 km from where they were found speaks to the complexity of and antiquity social networks from across the Great Lakes, Northern Plains, and the far West.

**Nash, Carole (School of Integrated Sciences, James Madison University)**

[1]

*Moderator*

[1]

*Discussant*

Nash, Charlotte [210] see Hanson, Tayla

**Nash, Donna (UNCG)**

[217]

*Home, Hearth, and Hammer: Detecting Migrants in the Wari Empire, Peru*

The existence of a prehistoric Wari Empire in the Andes of Peru was debated for several decades. Despite major shifts in settlement patterns and large-scale landscape transformations corresponding to their early expansion in the seventh century CE, researchers questioned Wari hegemony based primarily on the prevalence and quality of “imperial branded” ceramics. These artifacts were predominantly from tombs, which could be attributed to a network of prestige exchange rather than the material markers of political affiliation. In recent years, studies focused on archaeological households have dramatically reshaped perspectives on Wari expansion. This research has demonstrated colonists originating from the core of the polity as well as subsequent waves of migration with people moving between provinces. In this paper I advocate for household archaeology, a focus on domestic assemblages, and a “communities of practice” approach to quotidian activities as the means to move beyond narratives posing the conquerors vs. the conquered. Household archaeology can detect the nuances of culture change in Wari-affiliated colonial settlements, where locals and migrants from diverse cultural backgrounds interacted with each other, differentially participated in the polity as state agents, formed regionalized traditions, and changed some practices, while retaining others, over the course of several generations.

Nash, Donna [27] see Witte, Emilee

Nash, Stephen [89] see Shield Chief Gover, Carlton

Nash, Steve [137] see Baxter, Erin

**Nash-Pye, Charlotte (British Museum / University of Kent), Andrew Meek (British Museum) and St John Simpson (British Museum)**

[210]

*Current Research on Islamic Glass Bangles of the Arabian Peninsula*

The study of Islamic glass bangles has been undertaken on a localized or regional level by a number of authors. However, with advances in archaeochemistry the analysis of the primary production glass is offering new insights and contextualization to their typological and coloration differences. The presence of Islamic glass bangles across the Middle East and beyond has been documented from at least the tenth–twentieth centuries. Their height of dissemination appears to have been around the fourteenth century; however, there is some differentiation over their popularity between regions and periods. Those that are best understood are from the Eastern Mediterranean regions of the Levant and Egypt, although other studies have considered those from Anatolia, South Asia, and (from typological point of view) southern Yemen. Having undertaken an analytical and typological review of some collections from the Persian Gulf, this study now focuses on reassessing those along the Western Indian Ocean trade route, from the Omani coast to the Horn of Africa. It considers the unique chemical signature of bangles from Yemen, held at the British Museum, how this and distinct typologies connect with other collections analyzed, and the potential role the Arabian Peninsula played in their production and dissemination.

Nason, Zachary [26] see Waski, Nadia

**Nassr, Ahmed (University of Ha'il) and Zeljko Rezek (Collège de France)****[33]**

*The Relationship between Knapping Technology and Stone Use in the MSA Landscape of Northern Butana in Sudan*  
 In 2022 we recorded more than 40 variously dense stone artifact concentrations of the Middle Stone Age in northern Butana between the Nile Valley and the Atbara paleolake in east-central Sudan. In general, the entire region between the Upper Egypt and the Ethiopian Highlands has seen very little research of the Pleistocene records, especially to the extent sufficient to characterize the human behavior beyond mere flaking technology and artifact forms production. Here we first present the relationship between the variability in this technology and proxies of stone movement, reduction, and reuse, as sampled in these aggregates. We then examine these modeled relationships in regard to the locations of the raw material outcrops, our landscape sampling strategy, and the current visibility of this record. Our goal is two-fold: first, to use the variability of this record to infer past behavioral processes informing on the character of the landscape use (random vs. systematic), allowing us to test some of the existing landscape-use models for the broader northeastern African region, and, second, to examine the impacts of our own archaeological fieldwork practice (in this case, in landscape sampling) on archaeological knowledge generation.

Nathan, Smiti [77] see Buffington, Abigail

Navarro, Nadine [41] see Huckell, Bruce

**Navarro-Farr, Olivia (College of Wooster)****[186]***Moderator***Navarro-Farr, Olivia (College of Wooster), Rachel Horowitz (Washington State University) and Keith Eppich (Tyler Junior College)****[242]**

*Memory, Pilgrimage, and Social Life in an Ancient Maya City: Waka's City Temple as a Compendium of Political History*

Long-term research at Waka's City temple (Structure M13-1) demonstrates it was an important locale for ritual commemoration by local people as well and those from afar. Extensive and diversely constituted deposits throughout the building's surface demonstrate it was venerated publicly by non-elites throughout Waka's final occupations and gradual abandonment. Recent reexaminations of these materials confirm that they appear consistent with material assemblages from Waka's domestic contexts. We can now also complement early insights that the building was important for Waka's wider citizenry with deeper understanding of its earlier political significance and function; namely, that it formed a major component of the site's political and ritual landscape from the Preclassic and played a key role during the Early Classic Teotihuacan-Maya Entrada. Today the building's fronting plaza continues as the locus for various pre-excavation ceremonies. Together, this paints a picture of a monumental center that remains vividly remembered for its political and ritual importance, for centuries. In the context of the unifying theme of ruination studies and indigenous perspectives on such landscapes, we consider this building to be an example of how landscapes remain animate and how memory is itself an animating force that sustains meaning and situates action.

Navarro-Farr, Olivia [93] see Marken, Damien

Navarro Sandoval, Fernanda [200] see Punzo Díaz, José Luis

Navarro Sandoval, Fernanda [200] see Rodríguez-Rodríguez, Karla

Nava-Sánchez, Enrique [197] see Robles Montes, Mayra

**Navas-Méndez, Ana (New College of Florida), Daniel Pierce (University of Central Florida), Mary Ownby (Ownby Analytical LLC), Brandi MacDonald (Archaeometry Lab at MURR) and Michael Glascock (University of Missouri Research Reactor)**

[10]

*Communities of Practice and Panamanian Majolica Production*

This paper deals with the production of Panamanian majolica in comparison with other colonial ceramics. Chemical and mineralogical characterization show the use of a distinctive recipe for the production of this colonial ware. These results are consistent with previous interpretations that imply the community of potters controlled the production of the recipe in Panama Viejo. However, in contrast to other interpretations that rely on the consumption of imported pottery to explain the disappearance of this ware, we suggest that other factors such as secrecy around the recipe and the lack of access to raw materials played a role in the end of its production. Contrary to the disappearance of Panamanian majolica, utilitarian wares flourished and continued to be produced through the nineteenth and twentieth centuries. The analysis challenges historical narratives that present the replacement of local technologies for Spanish industrialized ceramic production.

N'Dah, Didier [166] see Herve, Gwenael

**Neeley, Michael (Montana State University) and Geoffrey Clark (Arizona State University)**

[179]

*Whole Assemblage Behavioral Indicators: Examining Pattern in the Late Pleistocene of the Wadi al-Hasa, Jordan*

Since the 1980s, surveys in Jordan's Wadi al-Hasa document dozens of Late Pleistocene hunter-gatherer sites, some of them tested or partly excavated. To track landscape-scale forager mobility and settlement patterns over time, we examine 26 levels from 13 sites dated to the Middle, Upper, and Epipaleolithic using aspects of Barton's WABI research protocol, a collection of methods designed to extract pattern from archaeological palimpsests. Because forager ethnographies document flexible adaptive strategies that do not readily map onto the discrete site types employed by archaeologists, we evaluate the utility of the latter so far as behavioral inferences are concerned. We show that discrete bimodal contrasts like "curated" and "expedient" and their archaeological correlates fail to capture a much more complex reality. Only by using WABI methods in conjunction with these analytical correlates can we attain a picture of forager mobility and land use that approximates that known from ethnography.

Neeley, Michael [47] see Clark, Geoffrey

Neeley, Michael [94] see Lee, Craig

**Neff, Hector (California State University, Long Beach)**

[216]

*Salt and Plumbate: Late Classic Multi-crafting in Eastern Soconusco, Chiapas, Mexico*

Archaeological mounds within the mangrove zone west of the Rio Cahuacan, in far-southern Chiapas, Mexico, have dense surface remains of broken Plumbate pottery, solid ceramic cylinders, and various other kinds of pyro-technological evidence. Clays from the region match Tohil Plumbate chemical composition, thus solidifying the inference that the mounds are Tohil Plumbate production centers. But if so, the Plumbate potters must have been poor ceramic artisans who broke huge numbers of vessels during production. Alternatively, Plumbate may have been made to be used on site. With a history of salt production stretching back to Early Formative times, one possibility is that Plumbate vessels were used for brine boiling in the production of salt. I discuss this possibility in the light of both earlier and later salt-production assemblages of the Eastern Soconusco mangrove zone. I conclude that a multi-crafting perspective provides the best fit to archaeological evidence recovered from these sites.

Neff, Hector [17] see Brown, Clifford  
 Neff, Hector [68] see Daniels, James  
 Neff, Hector [216] see Goodwin, Whitney  
 Neff, Hector [3] see Rankle, Chad

**Neff, Nadia (University of New Mexico), Erin Ray (University of New Mexico), Viorel Atudorei (University of New Mexico) and Keith Prufer (University of New Mexico)**  
 [252]

*Creating a Quality Control Protocol for Analyzing  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  from Tooth Hydroxyapatite*

Stable carbon ( $\delta^{13}\text{C}$ ) and oxygen ( $\delta^{18}\text{O}$ ) isotope analysis of the carbonate fraction of hydroxyapatite in human tooth enamel is a well-established and powerful tool in archaeological science that researchers use to study the relationship between past human populations and their environments.  $\delta^{13}\text{C}$  analysis can provide information on the primary producer sources of dietary macromolecules (protein, lipids, and carbohydrates) that are incorporated into tissues. Whereas  $\delta^{18}\text{O}$  analysis can be used to reconstruct past temperature, water source, and mobility patterns when paired with other bioarchaeological and mortuary data. Oxygen isotopes in the phosphate and carbonate fractions of hydroxyapatite are derived from the same pool. Consequently, the  $\delta^{18}\text{O}$  values reflect the same external and internal conditions and should therefore have a linear relationship. Deviations from this relationship in archaeological tooth enamel can indicate diagenetic alteration and lead to incorrect estimates of temperature, water source, or geographic location. This study seeks to explore the range of variation in the offset of  $\delta^{18}\text{O}$  values derived from the carbonate versus the phosphate fraction of hydroxyapatite in a sample of modern human tooth enamel and dentin to establish a quality control protocol for assessing the reliability of isotope ratios derived from archaeological carbonate and phosphate.

Neff, Nadia [17] see Prufer, Keith  
 Neff, Nadia [99] see Ray, Erin

**Negrino, Fabio (University of Genoa), Tobias Lauer (University of Tuebingen), Andrea Zerboni (University of Milan), Sahra Talamo (University of Bologna) and Guido Mariani (University of Milan)**  
 [87]

*Early Middle Paleolithic Blade Lithic Technology from the Site of Via San Francesco (Liguria, Northwestern Italy): Geoarchaeology, Chronology, and Cultural Features*

During MIS 5, in northwestern Europe, there are lithic assemblages characterized by the application of laminar methods performed on volumetric cores through a careful maintenance of lateral and distal convexities. In southern Europe, although blades are reported in several Mousterian contexts, nothing comparable to what has come to light in the abovementioned sites has been identified to date. An exception is the site of Via San Francesco, which is characterized by a high production of laminar blanks, obtained both from Levallois cores and from prismatic and pyramid-shaped cores based on a volumetric concept, but also by the presence of back knives, burins, and endscrapers. New dating places it at an early phase or earlier than MIS 5. Although echoing what has been observed further north, especially in France and Belgium, this site has so far no comparisons with other techno-complexes from Liguria or southern Europe, remaining a “unicum” that raises interesting questions regarding its maker, whether it can be traced back to Neanderthal communities that developed culturally and technologically innovative strategies, or whether it could be linked to the spread of Levantine technologies in Europe, or finally, to early and episodic incursions by groups of anatomically modern humans

Negrino, Fabio [87] see Gazzo, Silvia  
 Negrino, Fabio [87] see Gravel-Miguel, Claudine  
 Negrino, Fabio [87] see Riel-Salvatore, Julien

**Neller, Angela (Wanapum Heritage Center, Grant County PUD)****[32]***Moderator***[78]***Discussant*

Nelson, Elizabeth [102] see Broomandkhoshbacht, Nasreen

**Nelson, Fox (University of Wyoming), Briana Doering (University Of Wyoming), Megan Reel (University Of Wyoming) and Madeline Mackie (Weber State University)****[44]***The Curation Crisis and the Bones of the Colby Mammoth Site*

In the world of museums and curation, the curation crisis is accelerating. Due to poor preservation and curatorial techniques used in the past, many items in curation have been destroyed, physically lost, or lost their provenience. As standards get better and preservation techniques improve, a lot of artifacts located in collections are being rediscovered or reevaluated as new curators look through their collections. It is important that curators establish new methods for preservation within their collections, and the bones of the late Pleistocene Colby Mammoth site (located east of Worland, Wyoming) are no different. Originally excavated by George Frison in the latter half of the twentieth century, the techniques of curation have surpassed those of the 1970s and 1980s. By looking at the Colby Mammoth bones, researchers can begin to answer questions dealing with how curatorial practices have affected artifacts in their collections, especially organic remains like bone. To answer these questions, we examined the impact curatorial practices have had on the bones, and how practices have changed since the bones were put into the UW archaeological repository. The results show how curatorial practices have developed over time, and how these practices have physically influenced the artifacts in their collections.

Nelson, Fox [29] see Mackie, Madeline

Nelson, Nate [41] see Freund, Kyle

**Nelson, Peter (University of California, Berkeley)****[39]***Discussant***Nelson, Peter (University of California, Berkeley)****[98]***Indigenous Stewardship, Comanagement, and Knowledge Production: A Perspective from the California Coast*

Resource management and academic disciplines focused on the study of cultural heritage and the environment have historically trained practitioners and hired for positions focused on either cultural or ecological aspects of the landscape. This dichotomy may be a convenient compartmentalization of knowledge and expertise from some perspectives on land and resource management at various scales (local, state, and national), but this separation of people from nature is contrary to the ways that many Indigenous knowledge systems conceive of relationships between people and the world around them (Nadasdy 2004). In considering cultural landscapes, archaeologists, ecologists, and land managers must work in collaboration with Tribes and Indigenous communities to ensure that these perspectives are integrated into more holistic land and resource stewardship. An example from Coast Miwok territory, or what is now Marin and Sonoma Counties, will be discussed.

Nelson, Samuel [216] see Crider, Destiny

Nelson, Shaun [209] see London, Maia

Nemeth, Krisztian [20] see Vallebuena-Estrada, Miguel

Nenadic, Draženko [240] see Jovanovic, Mihailo

**Netherly, Patricia (Vanderbilt University)**

**[61]**

*Recovering Social and Political Structures on the Precolumbian North Coast of Peru*

It has been several decades since archaeologists first recognized that information about prehistoric social and political structures of precolumbian societies could be recovered by careful and appropriate archaeological survey and excavation. Careful observation and recording made latter recognition of structures related to social and political organization possible as well. Recent archaeological work in the last decades has provided additional confirmation. Reports initially focused on the final millennium before the arrival of the Europeans. More recently, careful recovery and recording of archaeological data by archaeologists such as Mackey, Shimada, and the Pozorskis, to mention only a few, has shed light on the later cultures. The final reports on the early hunters and gatherers of the heads of the coastal valleys on the excavations at Huaca Prieta by Dillehay, Shimada, Mackey, and others confirmed that many such structures could be traced back to the early preceramic period and earlier. Further research now indicates that the evidence for these structures is both earlier and abundant if it is recognized. It is clear from the North Coast case that archaeologists must include familiarity with the organization of social groups in this area gained initially from Spanish accounts and ethnographic reports in their research designs.

**Neubauer, Fernanda (University of California, Los Angeles; University of Wisconsin, Madison)**

**[239]**

*Chair*

**Neubauer, Fernanda (University of California, Los Angeles; University of Wisconsin, Madison)**

**[239]**

*The Research Potential of Fire-Cracked Rock in Cooking and Noncooking Contexts*

The information potential of fire-cracked rocks (FCR) and their associated features remain surprisingly understudied, given that they are ubiquitous at many sites, often well preserved, are little affected by the activity of collectors, and span hundreds of millennia of the human experience. Whereas FCR preserves well, taphonomic processes often make ephemeral many of the features used to identify fire archaeologically, such as burned faunal and botanical remains. A study of FCR should consider the range of variation in lithic use-alteration and fracturing patterns resulting from cultural interactions, and how they differ from natural processes, such as wildfires. Examination of these variations provides a more comprehensive view of the range of thermal processes that affected stones and fills in gaps in our interpretations of archaeological sites. FCR informs on a range of everyday behaviors, spanning economic (e.g., cooking), social (e.g., body warmth), and ritual (e.g., sweet lodge) spheres. Therefore, the study of FCR holds great potential for archaeological research worldwide and lays the groundwork for future studies in much the same way that ceramic use-alteration and organic residue analyses have contributed so profoundly to our understanding of ancient foodways and everyday life.

Neudorf, Christina [170] see Wriston, Teresa

Neufuss, Johanna [88] see Cebeiro, Adela

Neuhoff-Malorzo, Patricia [82] see Rabinowitz, Adam

**Neunzig, Samuel (Washington State University)**

**[30]**

*The Beginning of the Bow*

Why was the bow and arrow so widely used to replace the atlatl? To address this question, I present a study on the creation and use of the longbow and arrow in its early use, as well as the transition from the atlatl with focus on the effectiveness of both tools in penetrating power and accuracy at varying ranges to determine which is the overall more effective weapon. Using modern bow-making tools and techniques with the materials of yew, hickory, and ash wood, I re-created both kinds of tools from the Woodland period in eastern North America to test against whole meat products that represent prey animals of the time and ballistic gel molds for a consistent measure of the penetrating power. These tests are currently ongoing and I will be presenting my findings at the SAA conference.

Neves, António [95] see Dias, Rita

Neves, Eduardo [59] see Pugliese, Francisco

New, Briana [248] see Boyer, Cassandra

**Newell, Zachary (Oregon State University)**

**[145]**

*Geoarchaeological Prospection for Late Pleistocene Deposits in the Paleo-Tahkenitch River Valley, Oregon Coast*

The archaeological record of the paleo-Tahkenitch River valley, situated on the Oregon coast, spans the early to late Holocene. Previous work at the Tahkenitch Landing site (35CS43) has demonstrated human response to postglacial marine transgression, transitioning from an inland river valley to a productive estuary in the early Holocene to a freshwater aeolian dune-impounded lacustrine environment by the middle to late Holocene. Geoprobe coring of the immediate area surrounding the Tahkenitch Landing site has revealed intact late Pleistocene deposits buried across the locality close to the modern surface. This makes the Tahkenitch Valley exceptional among Oregon's coastal river valleys where late Pleistocene to early Holocene-aged deposits are buried as deep as 32 m below the surface. In this study we describe the expansion of Geoprobe coring into unknown areas and clarify the locality's <sup>14</sup>C dating to understand where the "dirt of the right age" (DORA) exists above the water table. This work is carried out as a precursor to new excavations of late Pleistocene-aged deposits—a critical first step in the search for late Pleistocene archaeological components.

**Newhall, Victoria (UCLA), Amber VanDerwarker (UCSB) and Christopher Pool (University of Kentucky)**

**[140]**

*An Evaluation of Food during Sociopolitical Transitions at Formative Tres Zapotes*

Tres Zapotes is an important site in the broader discussion of Olmec cultural continuity and Formative period political economy with an archaeological record that spans the two millennia between 1000 BC and AD 1000. It is a key site for understanding the emergence of Classic period civilization from ancient Olmec roots in Mexico's southern Gulf Coast lowlands. The occupational history and archaeological record at Tres

Zapotes challenges the previous notion that Olmec culture and traditions “collapsed” with the decline of La Venta around 400 BC, and recent work has argued that a shift from a centralized political structure to a more decentralized/collective one can be attributed to the florescence of Tres Zapotes when other polities fell. To expand upon this work, I utilize paleoethnobotanical data from Tres Zapotes to examine what patterns in foodways (practices surrounding food production, consumption, storage and disposal) can reveal regarding sociopolitical transitions over Tres Zapotes’ long culture sequence. Comparative analyses across elite and non-elite contexts through time reveals changes in provisioning and processing strategies providing insight into the role of food throughout Tres Zapotes’ continuous occupation and the changes in political-economic strategies therein.

**Newland, Michael (Environmental Science Associates)**

[157]

*Discussant*

**Newsom, Bonnie (University of Maine)**

[38]

*Discussant*

**Newton, Matthew (University of Florida)**

[49]

*The Paleo Suwannee Project: Offshore Research in the Eastern Gulf of Mexico*

The goal of the project is to find and map a portion of the submerged Paleo-Suwannee River in the Eastern Gulf of Mexico. The main goals of our research are to find the Suwannee River channel offshore and map any archaeological sites encountered, and produce geological (sedimentological) and habitat (species and landscape) maps of the area at multiple scales. We will use this information to evaluate submerged sites of cultural heritage, and natural resources, to inform management and foster responsible stewardship. In line with the “collect once and use many times” spirit that guides most seafloor mapping efforts, our second objective ties into other priorities outside of archaeological science, since we aim to document the sediments and biota to inform management, sustainable use, and conservation of marine resources in this area. In the process, we are testing new and innovative remote sensing approaches.

**Ng, Laura (Grinnell College)**

[188]

*Moderator*

Ng, Laura [51] see Wang, Jiajing

**Ngandali, Yoli (University of Washington) and Michael Lewis (Confederated Tribes of Grand Ronde)**

[62]

*Digital Approaches to Willamette Valley Ground Stone Bowls*

Recent discussions in the Historic Preservation Office of the Confederated Tribes of Grand Ronde have focused on the interpretation of the use-life of decorated ground stone bowls in the Willamette Valley of Western Oregon. Historically, these belongings have been looted, sold off, gifted, or commissioned for museum display and often lack archaeological context. This paper presents the results of a “proof of concept” that investigates the use-life and final deposition of a sample of decorated and undecorated ground stone bowls and mortars from the Willamette Valley. Employing several nondestructive digital imaging techniques such as multispectral photography, photogrammetry, and reflectance transformation imaging,

these data can provide a framework for reassociating the surface modifications with systemic and contemporary practices as well as contribute to current community discussions of the use-life of decorated stone bowls

Ngandali, Yoli [14] see Gonzalez, Sara  
Ngandali, Yoli [62] see Lewis, Michael

**Ni, Jenny (Columbia University)**  
**[50]**

*Horse Warriors and Warrior Horses: Considering Horse Subjectivity in Plains Indigenous Societies*  
Survey in the Rio Grande Gorge of New Mexico over the past decade has revealed a robust corpus of Plains Biographic rock art depicting the coups and accomplishments of human warriors. While horses are equally present, most of them are secondary to the narratives depicted and appear as ridden mounts or captured wealth. However, an unusual panel found in the same area featuring a scene with a detailed horse questions this assumption. This paper will consider animal subjectivity in the interpretation of this panel to demonstrate how equine actors were equally lauded for their feats in Plains Indigenous societies.

Nials, Fred [166] see Welch, John

**Nicholas, George (Simon Fraser University)**  
**[39]**

*Discussant*

**Nicholas, George (Simon Fraser University)**  
**[153]**

*Unresolved Indivisibility: Protecting and Respecting Ainu Intangible and Tangible Heritage*  
Ainu conceptions of “heritage” connect worldview and place, knowledge and object, intent and action. As is the case in North America and elsewhere, current protection of Indigenous ancestral sites in settler countries foregrounds the tangible and its scientific value, at the expense of cultural values and needs. In the wake of UNDRIP and other similar declarations and acts, those regulatory agents now controlling Indigenous heritage must revise their policies to acknowledge, respect, and protect Indigenous heritage on Indigenous terms. This paper considers a new agenda for Ainu heritage based on Ainu values, UNDRIP articles, human rights, and social justice—in a manner that does not jeopardize traditional archaeological goals.

Nichols, Deborah [125] see Collins, Ryan

Nichols, Melanie [82] see Lohse, Jon

Nicholson, Chris [170] see Egeland, Charles

Nicodemus, Amy [218] see Tomazic, Iride

Nicolai, Dean [182] see Horton, Elizabeth

**Nicolay, Scott (University of California, Merced) and Miranda Fengel (Mariposa Museum & History Center)**

[196]

*Lives of Baskets, Lives of Weavers: Using Digital Heritage and Interdisciplinary Research to Restore Social Memory*  
In *Entangled*, his landmark theoretical work on the relationship between human beings and material culture, Ian Hodder emphasized the importance of understanding how things endure differently than people. Thus longer-lived objects can bridge gaps and carry meaning between multiple human generations. In Indigenous California, woven baskets represent a defining aspect of material culture and are widely considered to be animate beings with a form of membership in tribal communities, even when they have become alienated therefrom. At the University of California, Merced, a group of graduate students, working together with Indigenous basketweavers and local museum curators, developed the Baskets 2 Bytes project, which digitized baskets in small museum collections in order to make them available to their communities of origin as 3D images. During this heavily collaborative process, the team discovered that several of the baskets studied had belonged to Indigenous women, including Dulcie Beal and Lucy Hite, who were both famous weavers and important historical figures. Together with archival research and ethnographic interviews, these baskets and their 3D reproductions have become the anchor points for narratives that restore lost heritage and expand our knowledge of the complex interactions between people and the things they create.

**Niculescu, Tatiana (Alexandria Archaeology)**

[217]

*“Wide-Awake Merchants” and Reform-Minded Women: Archaeology of Alexandria, Virginia’s German Jewish Community*

Historical archaeological investigations of Jewish diaspora sites have often heavily relied on faunal remains, particularly the presence or absence of pig remains, as a proxy for Jewishness. Keeping kosher is not the only relevant component of Jewish diasporic identities or even the only component that is visible in the historical and archaeological records. Though faunal remains are an important piece of the puzzle, they do not tell the whole story of how individuals and communities understood and practiced their religious and cultural identities. Instead, clues linger in historic records, the ceramics and glass objects of everyday life, and in spatial patterns. This paper explores how several lines of evidence were woven together to not only identify the presence of Jewish Alexandrians but to also understand Jewish diasporic experiences in Alexandria, Virginia, in the late nineteenth and early twentieth centuries.

**Nielsen, Michael (Ilisimatusarfik University of Greenland), Christian Koch Madsen (Greenland National Museum and Archives), Aka Simonsen (Ilisimatusarfik University of Greenland) and Else Bjerger (Kujataa World Heritage)**

[173]

*Thule Culture in South Greenland, 1500–1900*

In collaboration with the NABO RESPONSE and Activating Arctic Heritage teams, Nunatta Katersugaasivia Allagaateqarfialu (Greenland National Museum and Archives) have intensively surveyed the Uunartoq Fjord, Igaliko Fjord, and Tunilliarfik Fjord, inner and outer fjord systems in South Greenland. The goal was to establish knowledge on the cultural landscape between 1500 and 1900 and establish knowledge on preservation of the cultural remains. The methods included surveying and recording new Thule settlements, excavating small test trenches in middens to establish knowledge on the economy through the analysis of faunal remains, and interviewing local populations about their knowledge on the past and present use of the cultural landscape. This project is led by Christian K. Madsen (Greenland National Museum and Archives) as a part of two international, cross-disciplinary collaborative projects, which brings together expertise and knowledge from the University of Greenland, Greenland National Museum, National Museum of Denmark, Memorial University of Newfoundland, University of Iceland, University of Bergen, University of Edinburgh, University of Glasgow, and University of Stirling. We present preliminary data and outline the project methods, goals, and deliverables.

Nielsen, Michael [173] see Madsen, Christian  
Nielsen, Michael [173] see Smiarowski, Konrad

**Nielsen-Grimm, Glenna (Natural History Museum of Utah, University of Utah)**  
**[231]**

*Discussant*

Niles, Erin [243] see Hoover, Hannah

**Nims, Reno (Portland State University)**  
**[49]**

*Local Trajectories, Regional Patterns, and Human Ecodynamics in Northern Māori Fisheries*

Archaeological fishbone assemblages are the product of dynamic interactions between human fishers and fish stocks, both of which are enmeshed in broader, dynamic socioenvironmental contexts which are continually transformed and sustained by people and nonhuman entities. Understanding the history of fisheries therefore depends on careful consideration of multiple factors that can influence the trajectories of fish stocks and fishing practices. In this paper I evaluate how changes in climate, human harvest pressures, and Māori fishing methods may have shaped the human ecodynamics of Māori fisheries in northern North Island, Aotearoa / New Zealand, from the earliest Polynesian arrivals (ca. thirteenth century) to the start of the nineteenth century. Integrating paleoclimate records, fisheries biology, archaeological landscape histories, and archaeological assemblages of fish remains—while carefully controlling for recovery and identification biases where appropriate—demonstrates that Māori fishing practices were much more variable after 1500 cal CE in this region despite the apparent resilience of earlier fisheries. The available evidence ultimately suggests that multiple, historically contingent factors influenced local trajectories of northern Māori fisheries over time.

**Nino, Sabrina, Sophia Stevenson and Beth Scaffidi**  
**[29]**

*Comparing Short-Term Dietary Variability throughout Early Life between Trophy and Nontrophy Head Individuals from Uraca, Arequipa, Peru*

Paleodietary analysis of incrementally forming  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  can show which points during early life growth and development individual diets converged and diverged from other individuals within a burial community. Understanding how those changes correspond with estimated age and sex and other key aspects of social identity or lived experience can shed light on social structure and behaviors. The site of Uraca, Arequipa, Peru, is a cemetery that was used over approximately 500 years, spanning the Early Intermediate period and early Wari periods (ca. 600–1000 CE), a time of intense climatic variability that likely impacted social strategies and intercommunity interactions. We examine short-term dietary change from infancy through young adulthood through stable isotope analysis from dentin microsections of first and third molars in male and female individuals ( $n = 20$ ) with various degrees of violent injuries and violent dismemberment. While sample sizes are too small to assess statistical significance, early life ranges in both carbon and nitrogen isotope ratios are generally narrower for non-trophy and uninjured individuals. This suggests participation in violence led to broader dietary options, whether due to differences in social identity at origin sites, or sampling the diets of diverse geographic areas throughout early life.

Niquette, Mason [88] see Baka, Abby

**Nissen, Zachary (Northwestern University)****[243]***Urban Commoner Households: (In)Equality and Daily Life at Aventura*

Cities are locations of diverse human interaction where persons from different families and social affiliations can gather, exchange goods, and participate in community events. However, the management of these diverse interactions and activities requires social and political systems that do not value the contribution of all residents equally, resulting in inequities. In this paper, I present survey and excavation data designed to assess the smallest households of Aventura's urban community and assess the nature of inequality at the site.

Illustrated through the horizontal excavation of two commoner households, this paper examines what life at Aventura was like for the city's lower-status residents. Through a discussion of domestic architecture, ritual practices, and refuse deposits, I argue that while some households at Aventura experienced inequality, they remained active and integrated members of the broader community. I conclude by reflecting on the role that this integration of low-status households played in the city's longevity and the maintenance of its robust and diverse population.

Nissen, Zachary [243] see Fitzgerald, Kat

Nissen, Zachary [243] see Wong, Eponine

**Noe, Sarah (UC Santa Barbara), Amber VanDerwarker (UC Santa Barbara), Gregory Wilson (UC Santa Barbara), Douglas Kennett (UC Santa Barbara) and Richard George (UC Santa Barbara)****[218]***Deer, Drought, and Warfare: An Isotopic Investigation of Hunting Strategies from the Eleventh through the Fourteenth Centuries in the Central Illinois River Valley (CIRV)*

This study explores the relationship between garden hunting and food security in the Central Illinois River Valley, an area plagued by endemic warfare and drought during the twelfth and thirteenth centuries. Located ~100 km north of Cahokia, the largest precolumbian polity in North America, the CIRV was composed of smaller settlements that lacked a regionally consolidated political hierarchy. In the twelfth century, the CIRV witnessed the establishment of palisaded villages and an increase in regional warfare. This presentation examines whether increased regional warfare constrained the deer hunting strategies of residents of the CIRV to agricultural fields adjacent to villages through the comparison of  $\delta^{13}\text{C}_{\text{apatite}}$ ,  $\delta^{13}\text{C}_{\text{collagen}}$ , and  $\delta^{13}\text{N}_{\text{collagen}}$ . Stable isotopes from bone collagen ( $\delta^{13}\text{C}_{\text{collagen}}$  and  $\delta^{13}\text{N}_{\text{collagen}}$ ) combined with bone apatite ( $\delta^{13}\text{C}_{\text{apatite}}$ ) reflect the whole diet (carbohydrates, lipids, and proteins), thus providing a powerful measure of the dietary significance of maize in the diet of white-tailed deer. With an increase of these combined measures of protein and carbohydrates indicative of increased maize consumption by deer, the integration of bone collagen and apatite will provide additional insights in the reconstruction of garden hunting practices.

Nogueira, Dany [102] see Gonçalves, Célia

**Nolan, Kevin (Applied Anthropology Laboratories), Talon Silverhorn (Ohio Dept. of Natural Resources), Glenna Wallace (Chief, Eastern Shawnee Tribe of Oklahoma), Joseph Blanchard (Treasurer, Absentee Shawnee Tribe) and Garet Couch (Cultural and Historic Preservation, Shawnee Tribe)****[136]***Toward a Balanced Public History in the Ohio Country: Collaborative Interpretation of the Histories of the Shawnee Nations at Great Council State Park*

In 2020, the Ohio Department of Natural Resources (ODNR) started planning for the state's 76th state park focused on the late eighteenth-century Shawnee town of Chillicothe on the Little Miami River. ODNR was committed to working collaboratively with the three Shawnee Nations to design the park and its interpretive content. Over the last two years, a team of ODNR staff and contractors collaborated with citizens of the

three Shawnee Nations (all of which are federally recognized tribes) designing the site and building layout, and crafting the interpretive content featured in the new interpretive center. Great Council State Park presents an accurate narrative of the context and consequences of the Shawnee history flowing through this point in time and space. We crafted a narrative that reflects Shawnee perspectives, past and present, on the Shawnee ties to this site and the Ohio Country. The exhibit is part of a broader reassertion of sovereignty by the Shawnee Nations over their culture, history, and homelands. We hope this example of collaboration between American Indian Nations and public agencies can serve as a model of appropriate and effective interpretation of history with and by those whose ancestors are the subject of study.

**Noll, Christopher (Archaeological and Historical Services, EWU)**

[42]

*An Evaluation of Olcott Biface Production*

Beginning with the introduction of the concept of an Old Cordilleran Culture, research related to early Holocene tool production in northwestern North America appears to assume commonalities of tool production throughout a huge geographic area. This assumption persists despite the recognition of unique cultural traditions, namely Olcott and Cascade. Consequently, the knowledge gained through Cascade collections analysis has been applied to Olcott technology without critically testing these assumptions. A large Olcott assemblage from Washington State at the north end of the Olympic Peninsula has provided a unique opportunity to test the relationship between Olcott technology and its regional temporal peers. This presentation focuses on Olcott biface production. The attributes of Olcott biface morphology and landmarks that relate to the production systems of projectile points and other bifacial tools are explored and compared to published data about similar tools from outside the Puget Sound and Olympic Peninsula region. The study considers the implications for the scale and relationships of early Holocene cultures of northwest North America.

**Noriega, Aldo**

[249]

*Quichunque: Un santuario inca de altura en la sierra norte de Lima*

Quichunque es un sitio arqueológico con indicios de haber tenido “génesis” local y evidencia de reocupación inca. Es el resto de un santuario de altura con infraestructura monumental superpuesto sobre la cima y laderas superiores de una montaña a 4.798 m. Su posición espacial privilegiada con vista a las principales cordilleras y montañas de la sierra central, ríos e incluso al océano pacífico, lo presentan como uno de los principales santuarios prehispánicos de Checras y la región del alto Huaura en la llamada sierra norte de Lima. Las investigaciones arqueológicas de carácter exploratorias, los datos etnohistóricos y la información etnográfica, muestran pruebas de su función como santuario de altura y su cronología relativa que posiblemente provendría desde el intermedio tardío hasta su última ocupación probada en la época inca, siendo esta última la que dejó mayor evidencia.

Noriega, Aldo [112] see Conlee, Christina

**Norman, Lauren (University of Kansas), Rolfe Mandel (Kansas Geological Survey, University of Kansas), Lauriane Bourgeon (Kansas Geological Survey, University of Kansas), Caroline Kisielinski (University of Kansas) and Justin Holcomb (Kansas Geological Survey, University of Kansas)**

[15]

*Bluefish Caves Revisited: Testing a Potential Pre-Clovis Site in Eastern Beringia*

Originally excavated by Jacques Cinq-Mars in the 1970s and 1980s, Bluefish Caves, Yukon Territory, yielded artifacts and faunal remains. Cinq-Mars’s chronology for human occupation at the site dates to as early as ca. 24 ka and has been corroborated by AMS <sup>14</sup>C-dated cut-marked bones. These findings support the genetic “Beringian standstill” model, which proposes an isolated human population persisted in Beringia during the

Last Glacial Maximum (LGM). Challenges to stratigraphic integrity, taphonomy, and bone modifications have hindered the acceptance of Bluefish Caves in the Pre-Clovis archaeological canon. In 2019, we tested Cave III to assess site formation processes and the potential for recovery of sedimentary ancient DNA (sedaDNA). Initial processing of sedaDNA samples indicates recovery of sufficient nucleic acids for identification of multiple taxa, providing a robust picture of LGM and post-LGM paleoenvironments in the region. We returned in 2022 to test the area in front of the Cave IV, not previously excavated by Cinq-Mars. Excavations exposed a ~1 m thick deposit of loess containing remains of late-Pleistocene fauna. Micromorphological analysis, combined with a significant radiocarbon dating program and extensive faunal analysis, allows us to understand the site formation processes and test the stratigraphic integrity of deposits at Cave IV.

**Norman, Scotti (Warren Wilson College)**

[57]

*Ideological Infrastructures and Biopolitical Ecology: Investigating Colonial-Era Entanglements of New Food and Religious Systems (Sixteenth Century, Ayacucho, Peru)*

The extended Spanish conquest of Indigenous groups in the sixteenth century prompted infrastructural collisions of governance, foodways, and religious ideologies that indelibly altered Indigenous physical and ritual landscapes. Through the entanglement of new European foods and animals (wheat, horse, pig, and cow) with traditional Andean foodstuffs (maize, camelids, and guinea pig), diverse Andean religious communities decided what to eat based on access to goods, personal preference, and ideological alignment. The 1560s Taki Onqoy (Quechua: “singing/dancing sickness”) movement shaped some of these choices—wary of the spread of illnesses and death, Taki Onqoy practitioners strategically rejected European foods to avoid bodily sickness. This presentation explores the (often unintended) ideological, biological, and political ramifications of adoptions and rejections of specific European and indigenous foods through faunal remains at the Taki Onqoy center of Iglesiachayoq (Ayacucho, Peru).

Notter, Olivier [87] see Rossoni-Notter, Elena

Novak, Mario [29] see Martinoia Zamolo, Valentina

Novotny, Anna [205] see Gallareta Cervera, Tomás

**Novotny, Claire (Kenyon College) and Brett Houk (Texas Tech University)**

[189]

*Games of Chance and Fate: Patolli at the Ancient Maya Site of Gallon Jug, Belize*

In 2019 at the ancient Maya site of Gallon Jug, in northwestern Belize, we documented several patolli boards incised into a plaster floor on a platform in an elite residential group. The patolli from Gallon Jug are in a residential context near the site center and not in monumental religious architecture or a palace, which differs from most known examples of patolli from the Maya lowlands. In 2022, we returned to Gallon Jug to renew our investigations. We uncovered several more patolli and were able to employ new methodologies for documenting those identified in 2019. The eight patolli boards inscribed on the floor vary in design and include styles novel to the Maya lowlands. Recent lidar data illuminate the setting of the residential group within Gallon Jug and expands our understanding of the architectural context of the patolli boards. In this paper we address questions about how and why the residents of Gallon Jug may have used the patolli boards, and whether they were part of a singular ritual or a recurring strategy for divination employed by a resident ritual specialist.

Nowaczewska, Wioletta [206] see Talamo, Sahra

Nowakowski, Matthew [65] see Lazizzera, Adrienne

Nowell, April [212] see Chang, Melanie

Nowlin, Jessica [95] see Plekhov, Daniel

**Nuccio, Victoria (University of Georgia), Danielle Riebe (University of North Georgia; University of Georgia) and Attila Gyucha (University of Georgia)**

**[121]**

*Environmental Change's Impact on Settlement Development during the Late Neolithic at the Site of Csökmő-Káposztás-domb*

In the Körös region of the Great Hungarian Plain, the Late Neolithic (ca. 5000–4500 BC) tell site of Csökmő-Káposztás-domb features an ancient paleomeander that weaves through the site. Magnetometry and systematic surface collection have identified a contemporaneous Late Neolithic settlement surrounding the tell, spanning almost 130 ha. Many Late Neolithic structures are purposefully located close to the tell and paleomeander, at high relative elevations. However, south of the tell, multiple structures are located close to the river at significantly lower elevations. Prior to water regulations in the nineteenth century, the Körös region had a marshy environment characterized by frequent periods of flooding. Periods of short-term environmental change, like flooding, affected where populations settled and expanded during the Late Neolithic. In this study, we identified two structures situated close to the paleomeander at lower elevations than other structures. Targeted excavations were conducted in the summer of 2022 to collect <sup>14</sup>C samples to date these structures. The results of these excavations, along with survey, material analysis, and remote sensing results, provide a comprehensive understanding regarding the relationship between human-environmental interaction and site development at a tell-centered settlement complex during the Late Neolithic on the Great Hungarian Plain.

Nuevo-Delaunay, Amalia [148] see Méndez, César

Núñez-Cortés, Yahaira [213] see Suárez Calderón, Amanda

Nussear, Kenneth [64] see Bradley, Erica

**Nutor, Kofi (Texas A&M University, College Station)**

**[10]**

*Chair*

**Nutor, Kofi (Texas A&M University, College Station)**

**[10]**

*The Landscapes, Memories, and Identities of Atlantic Slavery at Peki, Ghana*

This paper explores the complex history of Atlantic slavery and European colonization in Peki, a frontier Ewe community in present-day southeastern Ghana. This community played a pivotal role that led the pan-Ewe confederacy—the Krepí—out of Akwamu and Asante domination in the mid-nineteenth century. To consolidate their power, the Peki made two major maneuvers. First, they invited the North German Missionary Society to their community in 1847, with the aim of using them to gain direct access to European merchants on the coast. Second, they established a franchise of the influential Krachi-Dente deity at Peki. The Krachi shrine had controlled the Atlantic slave in the nineteenth century until it was destroyed by German colonial officials in 1894. The Peki shrine also became a major source of Peki's religious, political, and economic power at the height of post-abolition slavery. This paper draws on archaeological, archival, and ethnographic data to complicate the dichotomy of victims and perpetrators of the Atlantic slave trade in

Africa. It highlights the utility of community-engaged and interdisciplinary research in understanding ways that the material remains, memories, and identities of enslavement have been preserved or erased as local values and power dynamics have changed over time.

Nyman, James [167] see Lowe, Lexie

O'Boyle, Rhododendron [71] see Baxley, Aleta

O'Brien, Helen [181] see Prasciunas, Mary

Odjick, Doug [132] see Desrosiers, Pierre

O'Donnell, Tristan [27] see Zuckerman, Jill

Oga, April [166] see Welch, John

Ogalde, Juan Pablo [102] see Arriaza, Bernardo

**Ogburn, Dennis (University of North Carolina, Charlotte)**

**[213]**

*Conveying Inka Ideology of Warfare for Establishing and Maintaining Political Control*

Ancient empires relied on warfare to conquer other groups and incorporate them politically. However, they did not always resort to armed conquest and often annexed new territories through negotiation backed by the perception of the empire's military strength, which also underpinned the consolidation and perpetuation of political control in those regions. Thus, the idea of military might was an essential element of imperial ideology that needed to be communicated to provincial subjects. In many earlier Andean complex polities, we see ideology of warfare materialized through imagery on ceramics, textiles, and other media that were pervasive in their realms of political control, which allowed leaders to convey their military prowess in a portable, accessible manner. But such imagery is rare in Inka material culture, marking a significant break from the practices of earlier societies such as the Wari and the Moche. The Inka relied much less on the visual materialization of their warfare ideology, a trend that has roots in the Late Intermediate period; instead, they used ceremonies, demonstrations, word-of-mouth, and other mechanisms to project their martial superiority; these are typically not directly visible in the archaeological record and are understood primarily through historical records.

**Ogundiran, Akin (UNC Charlotte)**

**[60]**

*Chair*

**Ogundiran, Akin (UNC Charlotte)**

**[60]**

*Women in the Nexus of State Power in the Oyo Empire*

Women's work and administrative leadership were essential to the running of the Oyo Empire (ca. AD 1570–1836). As wives, mothers, sisters, daughters, enslaved and free bureaucrats, traders, artisans, and laborers, women played a wide range of roles in palace administration and in financing and reproducing the state (materially and biologically). Archaeological research in the borderlands, frontiers, colonies, and the metropolis of the empire has uncovered several contexts that allow us to explore questions of gender and power, especially how women were mobilized to serve the interest of the state. This presentation will

examine the material practices and living contexts that give us insights into the entanglement of women in state power, the implications for understanding the political economy of the Oyo Empire, and the very meaning of womanhood in the Oyo cultural universe. Social class, citizenship vs. non-citizenship, free vs. enslaved, age, skill (i.e., type of work), and marital status affected the ontologies of gender. This intersectionality will be used to interrogate the archaeological record toward developing an empirically grounded theoretical framework for understanding the ontology of gender in the Oyo Empire and its implications for the operationalization of power in the production and reproduction of the empire.

Ogutu, Julius [2] see James, Sydney

**Ohlrau, René (Kiel University Cluster of Excellence ROOTS) and Aleksandr Diachenko (Institute of Archaeology, National Academy of Sciences of Ukraine)**

**[184]**

*Demography and Social Organization of the Cucuteni-Tripolye Populations: An Evolutionary Perspective*

This paper addresses the broad issue of population estimates as proxies and drivers of the evolution of social structures taking the example of the Cucuteni-Tripolye cultural complex (CTCC) covering a territory from the Eastern Carpathians to the Dnieper region in modern Romania, Moldova, and Ukraine, 5000–3000/2950 BCE. Settlements of this cultural complex significantly vary in size. The largest of them, the so-called megasites or giant-settlements, reached an area of 100–320 ha. First, we analyze the impact of population estimates on understanding social organization of the CTCC populations. Second, our paper discusses population size and density at different spatial scales as drivers of social changes. Third, the CTCC example is considered in a broader framework of patterns and processes in arising complexity during late prehistory.

Okamura, Satoshi [205] see Sakaguchi, Takashi

Okumura, Mercedes [21] see Araujo, Renata

Okumura, Mercedes [148] see Batalla, Arlys Nicolás

**Olajide, Victoria (University of Oregon)**

**[60]**

*Human Agency and Theory in West Africa: Understanding Early Forest Agriculture Dynamics during the Neolithic*

Despite the fact that the need to study early indigenous agricultural systems in Africa has long been recognized and reaffirmed in recent archaeological discussions, African agricultural practices are still being modeled using concepts, terminologies, questions, lines of evidence, and methods derived from research elsewhere in the world. Studies in West African archaeological research, especially within the Neolithic, have provided evidence for developing models for the spread of farming. Yet, theoretical investigations of the emergence of food production systems, particularly in the forest-savanna region, have been limited. Hence, this presentation aims to highlight the possibilities and challenges of modeling forest (forest/savanna) agriculture through diverse theoretical approaches, while emphasizing the role of agency in the development and intensification of early socioeconomic systems within the forest/savanna region. The goal, therefore, is to contribute to the growing wealth of knowledge in West African theoretical and archaeobotanical discussions by creating an insight into understanding the dynamics of forest agriculture in West Africa.

**Oliver, Kalei (University of Texas, San Antonio)**

**[9]**

*Chair*

**Oliver, Kalei (University of Texas, San Antonio) and Rebecca Bria (University of Texas, San Antonio)****[9]***Hilltops and Libations: A New Pattern of Recuay Ritual Space and Practice in the Northern Callejon de Huaylas Valley, Peru*

Archaeological studies of ancient hilltop constructions across Peru have revealed how ancient Andean people, often during the so-called “intermediate periods,” protected and defended their village spaces in times of interregional warfare and political balkanization. In the north-central highlands of Ancash, Peru, numerous studies have revealed that the Early Intermediate period Recuay (100–700 CE) created heavily fortified hilltop settlements with large perimeter walls, moats, and high visibility to ward off incoming threats; both domestic and civic-ceremonial activities occurred in these agglutinated, fortified spaces. Our survey in the northern Callejón de Huaylas valley of Ancash, Peru, has nonetheless revealed several rectangular platforms and nondomestic spaces in the most defensible locations, which suggests mountain prominences also played other kinds of roles in Recuay society. In-depth analyses of surface ceramics and drone-based mapping from one of these sites called Ushnucorral identified a large rectangular hilltop platform (35 × 40 m, ~3.5 m high) that was used for intensive Recuay feasting and ritual libations. Together, these data point to an intriguing new pattern of hilltop practices whereby the Recuay constructed ritual spaces, rather than walled house complexes, in the most defensible locations to perform highly visible, large-scale ceremonies.

**Oliver, Kristin (Simon Fraser University), Camilla Speller (University of British Columbia) and Jynnifer Zhu (University of British Columbia)****[76]***Using ZooMS to Evaluate Targeted Species Harvest of Pacific Salmon*

In a large estuary off the central coast of eastern Vancouver Island lies a series of fish trap complexes, which were used for catching herring and salmon in the past. Nearby, the large Pentlatch Village site contains the zooarchaeological remains of these harvests and provides an opportunity for researchers to obtain species-level identifications of salmon targeted in the past using collagen peptide fingerprinting (ZooMS). Historically, all seven of the Pacific salmonid species have spawned in the tributaries that feed into the estuary, but postcontact industries have impacted the state of the riverine and estuarine environments. Due to dwindling population numbers and salmon’s significance as keystone species, it is imperative that researchers expand historical understanding of these species. By providing insights into the complexities of precontact Indigenous fisheries, these data can aid modern conservation and management strategies in the future to ensure the continued and increasing stability of Pacific salmon populations.

Olsen, John [29] see You, Sen

Olsen, Karyn [125] see Whittington, Stephen

Olson, Brandon [69] see Landvatter, Thomas

**Olszewski, Deborah (University of Pennsylvania) and Maysoon al-Nahar (University of Jordan)****[168]***Fire Use in the Levantine Early Epipaleolithic: The Dibble and Colleagues Lithics Count Method*

Using a count method of complete and proximal burnt lithics  $\geq 2.5$  cm, Dibble and colleagues recorded a pattern of fire use by southwestern France Neanderthals whereby fire use was more common in warmer rather than colder intervals of the late Pleistocene. Recent work by Abdolazadeh and colleagues indicates that this pattern is also found in other areas of Europe. Here, we apply the Dibble and colleagues count method to assess fire use by Early Epipaleolithic modern humans living during the Last Glacial Maximum

(LGM) in the western highlands of Jordan. While the Levant is more southerly than Europe, colder/drier conditions pertained during the LGM. Our investigations are aimed at examining if the Dibble and colleagues count method is also applicable to modern human contexts and in areas that would have been less cold overall than Europe. Such assessments have the potential to offer insights into modern human behaviors compared to those of Neanderthals.

**O'Mansky, Matt (Youngstown State University)**

[49]

*Chair*

**O'Mansky, Matt (Youngstown State University), David Parker (Youngstown State University), Ronald Madeline (Youngstown State University), Caleb Self (Youngstown State University) and Samuel Witham (Youngstown State University)**

[49]

*Five Centuries of Post-occupation Formation Processes: Excavations at the Dim Bay Site, Bahamas*

SS-5, the Dim Bay site, is a prehistoric Lucayan site on the east side of San Salvador Island, Bahamas. Ongoing research reveals intricate stratigraphy in comparison to other sites on the island. While most sites on San Salvador are in protected locations on the leeward sides of dunes, SS-5 is on a low transverse dune by the beach between the ocean and an inland lake. This setting has exposed SS-5 to centuries of extreme storms, including hurricanes and surges, while erosion and changing sea levels have further shaped the site. As a result, SS-5 is composed of at least three strata: a sterile light-colored sand stratum, a darker colored loamy sand cultural horizon, and a lighter colored sand intermixed with plastic. The cultural horizon, buried under increasing amounts of sediment, represents the top of the dune at the time of occupation. This stratigraphy represents the passage of four periods of time. In this presentation, we describe research methods and findings at SS-5 with a focus on formation processes that gave the site its present form—and continue to play havoc with the sedimentology of the island as a whole and threaten the continued existence of the Dim Bay site.

**Onken, Jill (University of Arizona), Jessica Munson (Lycoming College), Andrés Mejía Ramón (Okinawa Institute of Science and Technology) and Lorena Paiz (Asociación Tikal)**

[123]

*Low-Density Maya Urbanism in the Dynamic Fluvial Landscape of the Upper Usumacinta Confluence Zone*

Proximity to aquatic resources, rich soils, and transportation corridors can make riverine landscapes attractive settings for human occupation. Floodplains, however, are dynamic environments subject to flooding, erosion, and channel migration, which can dramatically transform the surrounding landscapes and create challenges for sedentary communities. The Proyecto Arqueológico Altar de Sacrificios (PAALS) is an interdisciplinary project studying the history of human occupation and landscape change in the Upper Usumacinta Confluence Zone (UUCZ)—a riverine landscape situated along the modern border of Guatemala and Mexico. Recent drone surveys have documented numerous mound groups that suggest dispersed, low-density settlement distributed across the study area. Many of these mound groups are associated with meander scroll bars, paleochannels, and oxbows that contain clues about the fluvial history of this river system. Supported by the SAA's H. and T. King Grant for Precolumbian Archaeology, we undertook geoarchaeological investigations in 2021–2022 to better understand how geomorphic floodplain processes have shaped human-environment interactions in the UUCZ over the last 3,000 years. This poster presents results of this work, including a preliminary geomorphic map and chronostratigraphic framework for the area, as well as a detailed settlement map identifying sites at imminent risk of destruction by channel migration.

Onken, Jill [165] see Mejía Ramón, Andrés

Onken, Jill [142] see Munson, Jessica

Onofre, Jose [249] see Kanezaki, Yuko

**Oppenheimer, Jonas (University of California, Santa Cruz), Beth Shapiro (University of California, Santa Cruz), Ed Green (University of California, Santa Cruz), Greg Wilson (Parks Canada) and Gregg Adams (Western College of Veterinary Medicine)**

[94]

*A Paleogenomic Approach toward Reconstructing Bison Evolutionary History*

At the end of the nineteenth century, overexploitation of bison reduced the population from an estimated 30 million to approximately 1,000 individuals. Despite the magnitude of this bottleneck, we do not understand how bison were affected at the genetic level, nor do we know past bison population structure or how these populations may have contributed ancestry differentially to today's herds. Additionally, this event may have coincided with the introduction of cattle ancestry into bison herds, though the extent of such ancestry remains unclear. Ancient DNA has the potential to directly reveal bison evolutionary history that is obscured by recent demographic events. We sequenced low-coverage nuclear genomes of Holocene bison from across their range in North America to understand how genetic diversity was distributed over space and time. We find that past bison populations fall outside of the diversity of bison today, and that the modern structure of bison herds likely arose relatively recently though current populations are more strongly differentiated than in the past. We anticipate that better understanding past bison population structure and gene flow will allow for more effective management of bison herds which maximizes their genetic diversity and the future success of the species.

**Oré Menéndez, Gabriela (University of Nevada, Las Vegas)**

[176]

*Equity and Technological Transfer in Archaeological Practice: The Use of Satellite Image Analysis and Shared Workflows*

This poster addresses the lack of equity present in archaeological practice, focusing on the use of high-end technological methods, like image analysis and multispectral satellite remote sensing (MSRS) in particular. The use of these advanced computational tools allows for a new type of regional- and even interregional scale research and expands and transforms the type of questions we ask; unfortunately, these new questions will be posed mainly by professionals with robust research support since access to advanced computational technologies is in many cases cost prohibitive in terms of human resources (specialized knowledge) and access to technology (powerful and advanced hardware and software). This poster proposes the creation of a shared and accessible workflow library and presents an example of such workflows focusing on the use of MSRS in detecting agricultural infrastructure during the colonial occupation (seventeenth century) in the region of Huarochirí, Perú. Creating a replicable workflow includes the description and explanation for each step as well as the analytical tools included in the analysis. The goal of the workflows is to present easy-to-follow instructions and explanations for particular research analysis tasks that can be replicated, adapted, and improved with basic analysis functions.

O'Rourke, Dennis [88] see Potter, Bethany

**Ortega, Allan (Centro INAH Quintana Roo) and Vera Tiesler (Faculty of Anthropological Sciences of the UADY)**

[58]

*Comparing Demographic Shifts versus Permanence across the Maya Lowlands: A Multiproxy Approach to the Centuries Surrounding the "Maya Collapse"*

The so-called Maya collapse has been seen as an entelechy of the depopulation and emigration of the great Maya cities of the lowlands during the ninth and tenth centuries AD. However, proper paleodemographic and archaeodemographic works that support this entelechy are scarce. In this paper, we redimension different

paleodemographic scenarios with systematically collected population data of large skeletal populations from four different Maya Lowland areas; namely, the northern, southern, and central Petén, along with that of the Copán Valley, Honduras, through the Late Terminal Classic and Terminal Classic–Early Postclassic periods. The sample is composed of 690 individuals from 39 archaeological sites from Guatemala, three from Mexico, and one from Honduras with determined sex and age and chronologies, obtained from the literature and one of the coauthors' own databases (VT). The modeling of residential and structural mobility (fecundity, mortality, and migration) demonstrates drops in life expectancy in all areas except for the Copán Valley. As for the migration indicators, we observe intraregional entries and exits of individuals, thus reconfiguring the cultural and population space.

Ortega-Ramírez, José [200] see Rodríguez-Rodríguez, Karla

**Ortiz, Esequiel, Austin Schraub (University of Texas, Austin) and Manda Adam (University of Texas, Austin)**

[73]

*GIS Analysis of Environmental Change during the Paleoindian Period in Central Texas*

With the advent of GIS (geographic information systems) technologies, GIS has allowed archaeologists to ask new questions of the archaeological record. The state of Texas has one of the richest archaeological records in North America from decades of work by professional, academic, and avocational archaeologists. Due to Texas's rich archaeology record, ample archaeological site data is available to utilize with GIS data to ask new questions of the state's archaeological record. In particular this research will utilize novel GIS methods and techniques to demonstrate environmental change during the Paleoindian period to understand environmental change and its impact on human culture, movement of peoples, and site selection. Although Paleoindian sites in Central Texas are fairly rare, these analyses hope to illuminate patterns of Paleoindian people's movement and settlement to better pinpoint potential Paleoindian sites for future archaeological endeavors.

Ortiz, Esequiel [73] see Schraub, Austin

**Ortiz, Jose Raul (University of Arizona) and Francisco Saravia (Universidad de San Carlos de Guatemala)**

[238]

*Chamá Vessels Revisited: Advances and Questions on a Northern Maya Highland Painting Style*

During the Late Classic period, a distinct painting style in ceramics emerged in the northern Maya highlands of Guatemala, revealing both the mastery of artisans and the worldview of the Maya. The Chamá style, whose vessels were manufactured on the banks of the Chixoy River, shows clear interaction across geographic and linguistic areas of Classic Maya culture. Northern highland ceramics, including the Chamá style, appear frequently in the Grolier catalogue published in 1973. In conjunction with other regional styles and objects, these vessels formed the foundation of a unique interpretation and milestone contribution to understanding the Maya underworld, pantheon, court activities, and scribal skills. The Chamá vessels have been one of the most looted in the Maya area with the majority of examples in museum and private collections and only a few known from archaeological contexts. We believe that these vessels present a particular perspective outside the "core" Classic Maya that should be analyzed altogether. This paper presents an update of what we know about Chamá vessels 50 years after Coe's *The Maya Scribe and His World* by making reference to an under-construction larger database of this painting style.

Ortiz, Maria [14] see Smith, Claire

**Ortiz Brito, Alberto (University of Kentucky), Arlina Morales Guillen (Universidad Veracruzana) and Daira Hernandez Bellido (Universidad Veracruzana)**

[9]

*Contesting Social Memory in Tres Zapotes and Its Hinterland during the Epi-Olmec Period: Preliminary Results of the Proyecto Arqueologico Nestepe-Rancho Cobata*

This paper examines the results of the Proyecto Arqueologico Nestepe-Rancho Cobata conducted in the municipality of Santiago Tuxtla, Veracruz. The project explores the role of Olmec sculptures in the development and contestation of social memory in Tres Zapotes and its hinterland, during the Epi-Olmec period. Previous research carried out in the area show that the Hueyapan and Nestepe colossal heads were reset on Late Preclassic architectural complexes of Tres Zapotes. On the other hand, the report of the colossal head discovered at Rancho Cobata, on the slopes of El Vigia Hill, mentions that a Classic period offering was placed near the monument's mouth. The contrast between the periods of reuse and the positionality in the regional landscape suggests that the colossal heads could have had multiple meanings, according to the material arrangements of the places they were set at and the sociocultural status of the individuals who claimed them. I discuss how Olmec sculptures shaped spaces into social arenas aimed at forging narratives of cultural identity and political authority in Tres Zapotes and its hinterland. The data presented comes from excavations done in Group I of Tres Zapotes and Rancho Cobata in the summer of 2022.

Ortiz Butrón, Agustín [100] see Hernández Sariñana, Daniela

**Ortiz-Diaz, Edith**

[13]

*Prehispanic and Colonial Technology Transition in Metallurgy Gold Work in Oaxaca: A Comparative Study*

In the northern Sierra of Oaxaca, it has been demonstrated that gold-copper-silver alloys were widely used between different prehispanic groups (Zapotecs and Chinantec). Nevertheless, with the conquest of the Sierra, new metallurgy and technological works arrived with the Spaniards and were adopted secretly by the Indians to create objects to offer in burials or pagan ceremonies. The goal of this presentation is to present recent archaeological, historical, and analytical investigations accomplished in the Zapotec and Chinantec areas in the past years, and to compare how access to raw material and metallurgy work was different in Oaxaca and Michoacán during the sixteenth century.

**Ortman, Scott (CU-Boulder)**

[142]

*Discussant*

**Ortman, Scott (CU-Boulder)**

[90]

*What the Old Ones Have to Teach Us*

This paper discusses two important directions in archaeology today. The first is the urge to better-incorporate Native views and interests into archaeological practice; and the second is the urge to make the results of archaeology more useful for the present and future. I suggest that a productive way to integrate these two urges is to treat the archaeological record as Native people do—as a source of knowledge for how to live now. I provide a few examples from my experience to illustrate this point and suggest a few ways that US Southwest archaeology could take advantage of this approach.

Ortman, Scott [184] see Cooper, Zachary

Ortman, Scott [97] see Vernon, Kenneth

Osborn, Alan [170] see Hitchcock, Robert

**Osborn, Jo****[128]***Fishing with Dogs: Canine Contributions to Andean Maritime Communities*

Dogs played many roles within prehispanic Andean societies, including companions, hunting and herding partners, guardians, sacrifices, and mortuary offerings. Their role within maritime communities however remains surprisingly understudied, particularly considering the importance of maritime adaptations to Andean political economy. Drawing on findings from recent excavations at Jahuay, a Topará village on the Peruvian south coast (200 BC–AD 150), this paper considers dogs' socioeconomic and ritual contributions to prehispanic maritime communities. Sacrificed dog burials, as well as canine and human footprints preserved in a flooded production area, reveal diverse ways that dogs participated in village life. At Jahuay, dogs likely helped Topará fisherfolk to hunt marine birds and guarded drying fish and mollusk meat from scavengers. Their importance as companions and their economic contributions were in turn an important factor in their appropriateness as sacrificial offerings during local community rituals.

O'Shea, Colleen [22] see Bongers, Jacob

O'Shea, John [106] see Lemke, Ashley

O'Shea, John [197] see Nash, Brendan

O'Shea, John [218] see Tomazic, Iride

Osores Mendives, Carlos [191] see Sharp, Kayeleigh

Osorio, Daniela [61] see Santoro, Calogero

**Ossa, Alanna (SUNY Oswego)****[83]***Discussant***Otárola-Castillo, Erik (Purdue University)****[137]***Discussant***[137]***Chair***Otárola-Castillo, Erik (Purdue University), Melissa Torquato (Purdue University), Jesse Wolfhagen (Purdue University) and Matthew E. Hill (University of Iowa)****[137]***Bayesian Multilevel Models of Diachronic Dietary Trajectories (DDTs) from 13,000 years of Great Plains Faunal Exploitation*

Zooarchaeologists rely on long-term records of faunal remains to study significant diachronic changes in human-environmental interactions, including foraging-farming transitions, human-driven extinctions, animal translocations, and the development of complex societies. Here, we define the magnitude and direction of change observed in the zooarchaeological record over time as Diachronic Dietary Trajectories (DDTs). DDTs have been particularly valuable for their potential to empirically evaluate macro-temporal predictions derived from theory. Archaeologists frequently conduct Null Hypothesis Significance Testing to assess whether such apparent trends are meaningful patterns that support or refute theoretical predictions. However, the vagaries of archaeological preservation and sampling complicate constructing geographically

and temporally accurate DDTs because of the incomplete archaeological record. Here, we use simulation and a sizeable empirical example of DDTs spanning 13,000 years of faunal exploitation by the people from the North American Great Plains. We show that Bayesian Multilevel Modeling (BMM) provides a framework to balance the drawbacks of the current methodologies and improve predictive power. Bayesian statistics thus provides a valuable framework for building comparisons of dietary proxies across regions and periods to understand the dynamics of DDTs.

Otárola-Castillo, Erik [170] see Burnett, Paul  
 Otárola-Castillo, Erik [176] see De La Puente-León, Gabriela  
 Otárola-Castillo, Erik [170] see Hill, Matthew E., Jr.  
 Otárola-Castillo, Erik [137] see Keevil, Trevor  
 Otárola-Castillo, Erik [73] see Lipps, Hannah

Otero, Francisco [172] see Ruiz, Judith

**Otis Charlton, Cynthia, Danielle Dadiago (University of West Florida) and Judith Bense (University of West Florida)**

**[216]**

*The Diaspora of Eighteenth-Century Mexican Figurines: The Intersection of Spain, Mexico, and La Florida*

In Spanish West Florida, a military presidio was established in 1698 to try to protect Spanish shipping and interests in the naturally deepwater port of the Pensacola Bay from constantly encroaching British and French pressure. Over the next 65 years the presidio was moved four times, enduring British-led Indian raids, French occupations, and eight hurricanes. The presidio was completely abandoned in 1763 when Florida was awarded to the British in the Treaty of Paris. All four locations have been relocated and extensively archaeologically and historically investigated. One result of this expansive study was the finding of 142 figurine fragments that come exclusively from the final two presidio locations, and are seemingly associated with the arrival of families and several groups of 100 young women brought from “central Mexico” to become wives of soldiers and tradesmen as the former Spanish garrisons transitioned into permanent settlements. We hope to present identification of a source area for these figurines, and others encountered in other eighteenth-century Florida shipwrecks, using PIXE, pXRF, and NAA analyses among others, thus providing a window into figurine production, export, and use for a time period for which we currently have no such information from Mexico itself.

**Outram, Alan (University of Exeter)**

**[214]**

*Discussant*

**Overholtzer, Lisa (McGill University)**

**[247]**

*Discussant*

**Overholtzer, Lisa (McGill University)**

**[247]**

*Toward an Archaeology of Indigenous Conquerors: Household Ritual Life at Tepeticpac, Tlaxcala*

Over the course of its two excavation field seasons in 2017 and 2022, the community-collaborative Proyecto de Arqueología Cotidiana de Tepeticpac has shifted its focus from the Postclassic period, when the Tlaxcallans formed a state that maintained its independence from the Aztec empire, to the early colonial period, when residents allied with Spanish forces to defeat their former enemies. Colonial houses and middens have been more ubiquitous and better preserved, a sign that some of our community collaborators have interpreted as their ancestors speaking. One project member remarked, “You are finding these things

because our ancestors want us to have this knowledge. They want us to know about what they did.” Tlaxcallans have been much maligned in contemporary Mexico as “traitors” for having sided with European colonizers over other Indigenous groups. The tide is changing, however, as more nuanced understandings of the conquest emerge across North America. Our excavations similarly help us understand the complex lived experience of these “Indigenous Conquerors” in the sixteenth century. This talk focuses on a domestic altar and large ritual deposit excavated in 2022, features that shed light on feasting practices and household cosmology at early Colonial Tepeticpac, Tlaxcala.

**Owen, Amethyst (University of Wisconsin-La Crosse)**

[43]

*Oneota Subsistence Patterns: Wild Versus Domesticated*

The late precontact Oneota populations of Southwestern Wisconsin practiced a mixed economy of wild resources, in addition to a full suite of domesticated corn, beans, and squash. Analysis of floral remains from the sites prior to European contact, as well as those at the time of contact will examine the impact of external stressor on the use of wild versus domesticated crops.

**Owen, Bryandra (Knight & Leavitt Associates)**

[105]

*A House of Ashes Is a House of Archaeology: An Argument for Using Video Games as Public Outreach*

In his 2018 book, *Archaeogaming*, Dr. Andrew Reinhard presented compelling arguments and research for video games and board games being important areas of study for archaeologists. In the years since the release of this titular book, many archaeologists who are also “gamers” have begun studying the cultural environments of their favorite games while also utilizing them as teaching tools. Newzoo reported that at the end of 2020 there were approximately three billion people worldwide who played games of some kind. Archaeology-based science communication and outreach often struggles to compete with pseudoarchaeology-based entertainment like *Ancient Aliens*; the use of gaming to communicate important archaeological concepts and ethics could be a valuable asset in reaching the general public. This poster will look at Supermassive Games’ 2021 video game *The Dark Pictures Anthology: House of Ashes*, as an example of how archaeogaming can be utilized for public outreach in order to discuss archaeological concepts, ethics, and the impact of pseudoarchaeology.

Owen, Bryandra [105] see Cipolla, Lisa

**Owen, Ross (Dudek)**

[187]

*Discussant*

**Owen, Ross (Dudek) and Roy Brubaker (Pennsylvania Department of Conservation and Natural Resources)**

[18]

*Archaeology and Forestry Perspectives on the Management of Rhyolite Quarries on Pennsylvania State Forest Lands*

This paper discusses best practices for the management of prehistoric quarries on public lands. It incorporates a brief overview of the threats facing the protection of archaeological resources within a temperate forest ecosystem. Leading with a discussion of management priorities from an archaeologist’s perspective, along with actionable recommendations to address the threats and better incorporate the quarries into the management activities of the Department of Conservation and Natural Resources, specifically the Bureau of Forestry. The impetus for this paper was the lack of clear direction regarding archaeological resources by either the land or cultural resource management agencies with jurisdictional responsibilities for both the quarry sites and the lands they occupy. This is counterbalanced by a discussion of management priorities and challenges faced from the perspective of a forester. The concluding remarks of

this paper are a follow-up to the initial best practices recommendations, synthesizing these two perspectives to outline the current condition of management practices within Michaux State Forest, and areas where additional attention is needed.

**Ownby, Mary (Ownby Analytical LLC) and Fiona Kidd (NYU—Abu Dhabi)**

[86]

*Ceramic Use and Production at Iron Age Bashtepé, Uzbekistan: A Preliminary Petrographic Study*

The ceramic corpus at Bashtepé, Uzbekistan, is a complex mix of pottery forms, fabrics, and technology. Some vessels are hand-made, while others are wheel-made. Transport vessels, cooking pots, and fine ware are all present. To better understand the acquisition and local production of this corpus, a preliminary petrographic study was conducted. This focused on analysis of samples from each of the 22 fabric groups identified. Clay samples from the site were included to assess local raw material characteristics. The goal was to begin to understand the *chaîne opératoire* for those vessels likely made at Bashtepé and those brought to the site from elsewhere. Thus, the ceramic traditions could be better understood regionally and related to the role that the site played in the broader cultural landscape.

Ownby, Mary [10] see Navas-Méndez, Ana

**Oyuela-Caycedo, Augusto (University of Florida)**

[61]

*The Ahistorical Shell Middens at the Northern Tip of South America*

Subject to different historical forms of colonialism, the northern tip of South America is a politically marginalized area that is arguably the least understood from an archaeological perspective. While there is a basic understanding of ceramically defined periods, little is known about human interactions with the changing physical environment since the beginning of the Holocene. We know less about early territorial occupations, or even the more recent Arawak-speaking Wayúú people, who still occupy Colombia and Venezuela today. Here I present some new research on the eastern coast of the Guajira Peninsula that yielded an unexpected change of view on what materials make historical episodes or events. I explore the meaning of the shell record in this particular dry land environment—the research project developed after a recent collaboration with Tom Dillehay that opened a series of unresolved questions.

Oyuela-Caycedo, Augusto [66] see Rey de Castro, Alejandro

**Ozbun, Terry (AINW)**

[37]

*Evidence for Pleistocene Horse Hunting on the Columbia Plateau from the Rock Island Overlook Site*

Recent reanalysis of selected artifacts from a 1974 archaeological salvage excavation at the precontact Rock Island Overlook site, 45CH204, in central Washington State indicates that cultural deposits are much older than previously reported. Projectile point chronology and obsidian hydration dating suggest the Rock Island Overlook site was first occupied 13,000–16,000 years ago. The assemblage also contains evidence of hunting Pleistocene horses. Horse blood residue was identified on a Windust type projectile point. This result also supports the age estimate for the site as Pleistocene horse extinction occurred about 12,700 years ago. Other data from the site are consistent with a Pleistocene age, although more information is needed to confirm and refine the dating.

**Ozbun, Terry (AINW)**

[171]

*Chair*

Ozbun, Terry [171] see Johnson, Meghan

Ozorio de Almeida, Fernando [59] see Kater, Thiago

**Pacheco, Ellen (University of Toronto)**

[118]

*Human-Animal Relations in Chihuahua, Mexico: Exploring the Ontological Turn in Zooarchaeology*

Projects taking place in the state of Chihuahua have, in recent years, begun to expand the understanding of local lifeways. The analysis of human-animal relations is perceived to have contributed to a greater understanding of ways in which researchers can reconstruct the lifeways in the past. This paper examines prehistoric lifeway patterns indicated by evidence collected by the Proyecto Arqueológico Chihuahua (PAC) in the Casas Grandes region in Chihuahua, Mexico, by analyzing faunal remains from four sites studied by PAC: CH- 254, CH-218, CH-240, and CH-272. My contributions to this topic come primarily through the analysis of human-animal relations, as seen through the examination of faunal collections. These faunal collections have not had a recent detailed analysis or a substantive writeup, which gives way for an opportunity to explore these data in relation to new theoretical approaches and develop a more holistic understanding of ancient lifeways. Specifically, I am to consider human-animal relations by deploying recent theory on ancient ontologies. The overall goal of this paper is to understand better the role human-animal relations played in supporting economic, social, spiritual, and dietary stability within everyday life throughout PAC and Casas Grandes.

**Pacheco Arias, Leobardo (Centro INAH Oaxaca)**

[72]

*Management in the World Heritage Site Prehistoric Caves of Yagul and Mitla in Oaxaca, Mexico*

This poster has the objective of showing the management strategies in the site “Prehistoric Caves of Yagul and Mitla in the Central Valleys of Oaxaca, Mexico,” inscribed on the UNESCO World Heritage List since 2010. In this site the participation of the Zapotec communities has been key for its administration, monitoring, conservation, and promotion. Some results of good community practices and governance strategies are presented.

Padilla-Iglesias, Cecilia [95] see Bischoff, Robert

**Padon, Beth (Partners for Archaeological Site Stewardship)**

[167]

*California Archaeological Site Stewardship Program (CASSP)*

There are many ways to organize and administer site stewardship. We highlight some characteristics of California site stewardship and we discuss why they matter. CASSP is provided by Partners for Archaeological Site Stewardship, a private, nonprofit organization. Because CASSP is not a government program, it may more effectively engage a diverse audience: one that includes people who are antagonistic or disappointed with governmental decisions, and one that includes people who belong to organizations or groups that normally do not work with government agencies. CASSP provides from two to eight training workshops a year throughout California. CASSP requires the local agency archaeologist to direct the trained volunteers. A focus on community cultural resources makes people more aware of the archaeological resources around them and helps build a local constituency for site protection. CASSP workshops provide instructions for site stewards but many, if not most, participants do not become site stewards. So the workshops also provide cultural resource awareness, by including Native American speakers and discussing the importance of archaeology and by including law enforcement officers and discussing safety and legal protections. Each participant receives a workshop notebook with archaeological background and contact information.

Page, David [28] see Haynes, Gregory

**Paige, Jonathan (University of Texas, San Antonio) and Charles Perreault (Arizona State University)****[137]***Are Changes in Rates of Technological Change Robust to Error? A Paired Bayesian and Simulation Approach to Assessing the Pleistocene Record*

Observed changes in rates of technological change play important roles in many models seeking to explain or identify the greater adaptability of some hominins over others, adaptation to changing environments, and many other processes. We quantify how robust detection of a shift in the rate of technological change is to error in measuring technological variation, uncertainty about site age, and the overrepresentation of recent sites. The approach taken here is to simulate new archaeological records based on parameters derived from a global sample. For each simulated record we then derive posterior estimates for the date of a shift in the rate of technological change, and the rates of change before and after that date. We find that even when raw data suggest a shift in the rate of change within a certain time period, when we take into account various biases inherent in the archaeological record, this decreases substantially our certainty about when a shift may have occurred, and its magnitude. The results highlight some issues with claims of greater observed rates of technological change in the recent record, relative to the Early and Middle Pleistocene. Such claims should more directly assess whether they are robust to various biases.

Paige, Jonathan [41] see Huang, Cindy Hsin-ye

Paige, Jonathan [150] see Snitker, Grant

**Pailes, Matthew (University of Oklahoma)****[166]***From the Sea to the Mountains: Dave Killick's Impact on Archaeological Science Advances in Northwest Mexico*

The borderlands setting of the University of Arizona has made it an epicenter for research focused on Northwest Mexico. This geographical proximity combined with the unfailing collaborative spirit of Dave Killick resulted in his students (official and honorary) having an outsized impact on the region. This presentation will review my archaeometric research focused on the Sierra Madre Occidental along with important contributions made by other Dave-influenced scholars in the adjacent Sonoran Desert and Coasts. The sum of these projects has substantially altered our understanding of the sociopolitical landscape of this important region that bridges the US Southwest-Mesoamerican continuum.

Pailes, Matthew [41] see Davidson, Jaron

Pailes, Matthew [48] see Krug, Andrew

Painter, Anita [14] see Smith, Claire

Paixao, Eduardo [33] see Marreiros, Joao

Paiz, Lorena [165] see Mejía Ramón, Andrés

Paiz, Lorena [142] see Munson, Jessica

Paiz, Lorena [123] see Onken, Jill

**Pajovic, Goran, Gilbert Tostevin, Samantha Porter, Nikola Borovinic and J. Anne Melton****[240]***Integrating Research Methods with Local Regulations: Designing the Excavation and Proveniencing System for the Middle Paleolithic Excavations at Crvena Stijena, Montenegro*

Theoretically informed research methods are only as good as the ability of the research team to put the methods into action. Between the well-intentioned plans of the PIs and the successful elucidation of fascinating anthropological questions lie the practicalities of difficult terrain, inconsistent access to water and

electricity, and bureaucratically difficult government regulations. Here we report on our efforts to bridge this gap as part of the collaboration between the University of Minnesota and the National Museum of Montenegro at the Middle Paleolithic site of Crvena Stijena (Montenegro). With funding from NSF and the Montenegrin Ministry of Culture, we implemented an excavation protocol that took practical challenges as opportunities to rethink standard methods in favor of novel approaches, including field digitization of excavation surfaces by georeferenced photogrammetry to avoid hand recording of non-artifactual features and objects, 100% sediment flotation despite water limitations, a twice-checked lab extraction of artifacts to 1 mm to allow for training of new lab assistants, and an integrated paper and digital backup system to compensate for inconsistent power. As nothing is perfect, we report on areas in which there is still room for improvement and a desire for feedback from the larger archaeological community.

Pajovic, Goran [240] see Cooper, Aspen

Pajovic, Goran [240] see Mallol, Carolina

Pajovic, Goran [240] see Monnier, Gilliane

Pajovic, Goran [240] see Porter, Samantha

**Palacios, Horvey (University of Oklahoma), Tanvi Honap (University of Oklahoma), Douglas Kennett (University of California, Santa Barbara), Keith Prufer (University of New Mexico) and Cecil Lewis (University of Oklahoma)**

**[163]**

*Ancient Maya Inequality and Oral Microbiome Ecologies from Classic Period Maya Contexts in Southern Belize*  
Oral microbial ecologies are shaped by an interaction among environmental and cultural factors, including wealth and status inequalities, which were pervasive throughout ancient Maya society. Few studies have directly integrated the oral microbiome of ancient individuals with a detailed analysis of their status from archaeological contexts. To interrogate this relationship, we conducted Illumina shotgun metagenomic sequencing of DNA from dental calculus ( $n = 12$ ). The sample consisted of elite, likely elite, and commoner individuals from the Maya Classic period (AD 250–900) interred at Uxbenká, Muklebal Tzul, and two caves in southern Belize, Bats'ub and Holom Kaminak. SourceTracker analysis of bacterial taxa confirmed that we recovered ancient oral microbiomes. This paper addresses the biological embodiment of structural inequalities through ancient microbiome research as a pilot approach to situated biologies across scales of status. The resulting analysis strengthens the reconstruction of community health and ancient Maya life histories at various positions through time and space in the Maya social landscape.

Palacios, Horvey [136] see Pitblado, Bonnie

Paladugu, Roshan [118] see Richter, Kristine

Palazzolo, Thomas [106] see Lemke, Ashley

**Palka, Joel (Arizona State University) and Fabiola Sanchez (University of Victoria)**

**[172]**

*A Rural Travel Stopover at the Late Postclassic Maya Site of Mensabak, Chiapas, Mexico: Overland Trade, Cross-Cultural Interaction, and Social Cohesion in the Chiapas Frontier*

A small rural stopover site in the frontier along overland Late Postclassic (ca. 1300–1500 CE) Maya and Aztec trade and travel routes was identified at Mensabak, Chiapas, Mexico. This site is similar in function to rural Old World and Andean caravan stop overs, such as caravanserai and way stations, where travelers and traders obtained supplies, trading partners, safety, travel information, and solidarity through ritual. These sites are functionally similar to trading ports and pilgrimage centers, but they are smaller, located in the distant countryside, are not managed by regional states, and have scaled-down economic exchange with less diverse exotic trade items. They often include landscape and rock art shrines, like the mountain and cliff sanctuaries at Mensabak, for collective ritual among travelers and locals. This presentation discusses the

archaeological research on, in addition to cross-cultural social, economic, and ritual implications of, small frontier stopover sites that united people on the road.

Palka, Joel [242] see Lozada, Josuhé

**Palomares, Maria (SIU)**

[91]

*Early/Middle Formative Pottery Production and Exchange in the Emergence of Social Complexity in the Mixteca Alta, Oaxaca*

Multiple lines of evidence, including pottery production, multi-crafting, goods and routes of exchange, architecture, and funerary practices, support the idea that Tayata in the Mixteca Alta was immersed in social transformations observed across different regions during the Early/Middle Formative (ca. 1400–350 BC). Changes at this macrolevel could affect local and regional developments, such as the emergence of social complexity. Tayata interactions with multiple areas were closely related to its local development process, showing particularly similarities with the Central Valley of Oaxaca in public constructions, like the one-room temple, and rituals, such as feasting and funerary practices. In addition, the results of portable X-ray fluorescence (pXRF) analysis of 141 samples from Tayata, in conjunction with neutron activation analysis (NAA) of 66 specimens, show that pottery production at Tayata followed both regional and macroregional traditions, and the imported pottery was mainly the result of a major Pacific coast exchange route that crosses the lowland coastal Isthmus of Tehuantepec, the mountainous Nejapa/Yautepec region, and the highland Central Valleys of Oaxaca. From there the route reaches the north of the Mixtec Alta, being a corridor of influence in both goods and ideas to the Mixteca, including Tayata.

**Palombo, Jocelyn**

[72]

*The Battle of the Boxes: The Importance of Updating Previously Curated Collections to Expand Knowledge and Create Space*

As universities, federal curation facilities, public museums, and private collections struggle to create space on their shelves, curators and archaeologists have to evaluate what must stay and what will have to go. Utilizing a collection housed at the University of Montana I will explore strategies for combating this issue. This collection was obtained from the Garnet Ghost Town and has been in storage at the University of Montana. Gathering new information with fresh eyes and innovative techniques to learn more about the collection itself and a deeper understanding of one of Montana's most complete ghost towns. The goals of re-curating this collection were to create a digital spreadsheet, identify objects of interest for testing or display, extensive photography, and identify portions of the collection to be returned to the ghost town for interment. Additionally, we view the collection with a new theoretical framework to be more race and gender inclusive than previously implemented. Creating a process that works in junction with the Bureau of Land Management, the University of Montana's graduate students, the Garnet Community, and the public, we conserve and preserve history and make room for more.

Palomo, Juan Manuel [162] see Burham, Melissa

**Palonka, Radoslaw, Boleslaw Zych (Institute of Archaeology, Jagiellonian University), Vincent MacMillan (Canyons of the Ancients National Monument), Katarzyna Ciomek (Institute of Archaeology, Jagiellonian University) and Jakub Sliwa (Independent Researcher and Institute of Archaeology)**

[28]

*Digital Documentation of Ancestral Pueblo Architecture and Rock Art in SW Colorado, USA: Heritage Management, Education, and Visualization*

The sandstone multilevel architecture (including famous cliff dwellings) from the central Mesa Verde region, southwestern Colorado in the US Southwest, together with rock art represents Ancestral Pueblo occupation

in the prehispanic times. This poster shows the application of various digital techniques for detailed documentation, visualization, and reconstruction of Castle Rock Community, one of the Ancestral Pueblo settlement clusters from the thirteenth century AD in this area. Different digital methods were applied: architecture within rock alcoves and beyond were documented using terrestrial laser scanning (TLS) and photogrammetry; terrain either by TLS and photogrammetry from a drone (UAV) as well as geophysical research; 3D models have been used to generate final 2D documentation and to interpret details of faint rock art panels (RTI/Reflectance Transformation Imaging technique). Research also focused on data integration and visualization for learning the relation between settlements, rock art, and the landscape using Digital Elevation Models, GIS, and even game engines. All these methods were partly presented in an educational digital platform that presents the Ancestral Pueblo heritage: e-sandcanyon.org and as a part of the exhibit displayed in the Canyons of the Ancients Visitor Center & Museum (Colorado) and Edge of the Cedars State Park Museum (Utah).

**Palus, Matthew (Ottery Group)**

[57]

*Washington's Board of Public Works and the Burial of Black Georgetown*

Cultural resource management projects in and around Washington, DC, have documented the episodic and nearly complete displacement of the city's first exurban Black communities in areas that would become metropolitan suburbs. This recurring theme illuminates a posture of indifference toward the Black communities that were established during the second half of the nineteenth century, and the relationships that are put in place as a result, between prospering people of color and a modernizing municipal/territorial government of Washington, DC. In the Georgetown neighborhood, a dramatic investment in the infrastructure followed the establishment of a single municipal government for the City of Washington in 1871, and the abolishment of Georgetown's charter as an independent municipality. Establishing new street grades in this context resulted in the near-burial of homes in an African American section of Georgetown, which became an unofficial dump for fill excavated during infrastructure work. Here I argue for an association between the extant and relict infrastructure and the former African American community of Georgetown, and use this perhaps tangential material culture to discuss the economy of Black Georgetown, through its buried homes and other outcomes of infrastructure projects in the city.

**Parbus, Brett (University of Georgia) and Victor Thompson (University of Georgia)**

[74]

*Preliminary Data for Developing a Fine-Scale Model of Socioecological Change on Ossabaw Island, Georgia*

This research project examines the history of human-environment interaction on Ossabaw Island, Georgia. Archaeological collections for Woodland (ca. 1000 BC–AD 1000) and Mississippian period (ca. AD 1000–1700) occupations of the island are combined with environmental data synthesized from the analysis of sediment cores taken from five freshwater ponds on the island with the goal of producing a fine-grained chronological model of environmental change on the island. Pollen, phytoliths, and microscopic charcoal extracted from the sediment cores are combined with radiocarbon dating and Bayesian modeling to assess the overall environmental history of the island, looking specifically for ecological changes that co-occur with significant cultural events signaled by the archaeological record. Once aggregated, this dataset will be used to examine the overall histories of demographic change and landscape modification undertaken by past groups, with specific attention to how changing environmental and cultural conditions necessitated cooperation and institutional change to better situate these groups within their ever-changing circumstances. Here, I present preliminary data collected during the 2022 University of Georgia Field School and discuss the research design, anticipated outcomes, and potential for broader application of this paleoenvironmental method.

Parbus, Brett [70] see Demyan, Marcela

Parbus, Brett [113] see Garland, Carey

**Parditka, Györgyi (University of Michigan)****[161]***Site Hierarchy and Ceramic Display: Regional Variation in Bronze Age Ceramic Assemblages in the Eastern Carpathian Basin*

Tell settlements have played a key role in the study of Middle Bronze Age (2000–1500 BC) societies in the Carpathian Basin since the end of the nineteenth century. Researchers primarily use data from these sites and cemeteries in discussions over relative and absolute chronologies, questions of variability in material culture, the extent of interaction networks or the interpretation of social structures. Little attention has been given so far to non-tell settlements and other shorter-lived sites of the same period, which significantly hinders our ability in the interpretation of these societies. This presentation focuses on Gyula 113, a Middle Bronze Age open settlement in the Körös Region in Eastern Hungary and compares its ceramic assemblage to tell settlements in the broader region. I combine ceramic stylistic analysis with spatial information to assess different decorative techniques and stylistic motifs in tell vs non-tell sites to help identify potential asymmetrical relationship between settlement types.

Parfitt, Simon [214] see Bello, Silvia

Pargeter, Justin [232] see Liu, Cheng

**Paris, Elizabeth (University of Calgary)****[172]***Chair***Paris, Elizabeth (University of Calgary), Ashley Megan Williams (University of Calgary) and Gabriel Laló Jacinto****[172]***The Production and Exchange of Obsidian in the Monumental Zone of Tenam Puente, Chiapas, Mexico*

This paper presents an analysis of obsidian artifacts from the ancient Maya city of Tenam Puente. The site is located in the eastern Chiapas highlands, and was occupied from approximately AD 500 to 1100. We analyze a sample of 859 obsidian artifacts from the site's monumental zone, which were excavated by the Proyecto Tenam Puente, directed by Gabriel Laló Jacinto. The associated contexts include all three of the site's ballcourts, as well as the royal palace courtyard, a religious plaza, a possible crafts barrio, and a small outlying residential area. While third-series prismatic blades are the most common artifact, the sample also contains debitage from local blade production, as well as the recycling of broken formal bifaces, suggesting the presence of highly skilled craftspeople. We analyzed 791 of the artifacts using X-ray fluorescence spectrometry, and the results were compared to known volcanic sources in Mesoamerica. While most obsidian at Tenam Puente was imported from El Chayal, a significant portion was also obtained from other sources, including relatively high proportions of obsidian from Pachuca and Zaragoza sources in Central Mexico. This is consistent with previous suggestions that Tenam Puente was an important node for long-distance exchange in the eastern Chiapas highlands.

Paris, Elizabeth [218] see George, Miranda

**Park, Gayoung (University of Washington)****[188]***Discussant*

**Park, Gayoung (University of Washington), Marlize Lombard (University of Johannesburg), Ben Marwick (University of Washington) and Donghee Chong (Kyung Hee University)**  
[152]

*A Study of the Function of Korean Late Paleolithic Stemmed Points Using Tip Cross-Sectional Area (TCSA)*

The introduction of blade technology, stemmed points, end scrapers, burins, denticulates, and finer grained materials led to the transition from the Early to Late Paleolithic in Korea. Stemmed points have been considered a representative tool that led this whole set of changes. We examine the role that the stemmed points played during the Late Paleolithic. Our main questions are: What were stemmed points used for? How diverse were their functions? What are the temporal patterns in stemmed point functions? We calculated tip cross-sectional areas (TCSA) to discriminate hypothetically between different weapon-delivery systems, for example, poisoned arrowheads or thrusting spear. Our results show that the stemmed points most probably functioned as javelins and thrusting spear tips, with smaller numbers as dart tips and arrowheads. TCSA values depend on size and raw material types. We found different usage of stemmed points in different sites. However, some sites show a wide range of TCSA values that may represent multipurpose usage of stemmed points. The temporal pattern of TCSA values is one of little change throughout the Late Paleolithic period. We conclude that stemmed points were mainly used as javelin tips, but they were multifunctional tools.

**Park, Geun Tae (ILYOUNG Cultural Heritage Research Institute)**  
[220]

*Distributions and Characteristics of the Cave Sites on Jeju Island during Late Pleistocene to Middle Holocene*

This study examines several cave sites on Jeju Island during the Late Pleistocene to Middle Holocene. Subsistence economy, occupation patterns, and cave usage durations are studied and compared. From 1.8 mya, the Jeju Island began to be formed through hydro volcanic activities. Since then, the continuous activities created the Hallasan Mountain and about 360 volcanic craters (oreum). The Seongsan Ilchulbong tuff cone, Biyangdo Island, and Songaksan Mountain are representative features from the continued activities during the Holocene and these volcanic events are documented in historical texts. Similar volcanic activities resulted in the natural caves on Jeju Island, which is known to have 178 lava caves. Some of these caves are registered as natural monuments, and some of the cave entrances or rockshelter sites have been used as dwellings or temporary camps throughout prehistoric to historic periods. In this presentation, the authors discuss the occupation patterns and site characteristic changes at the Billemot, Saengsugwe, Gwenaegi, Kimnyungri, and Bookchon cave sites.

Parker, David [49] see O'Mansky, Matt

**Parker, Evan (Millsaps College) and Ken Seligson (California State University, Dominguez Hills)**  
[176]

*Filling in the Gaps: Lidar-Aided Mapping of the Smallest-Scale Sites in the Northern Lowlands*

The Proyecto Arqueológico de Sitios de Pesqueña Escala en el Puuc Oriental (PASPEPO) recently completed an intensive mapping and surface collection program at three small-scale sites in the eastern Puuc Region of the northern Maya lowlands. Using lidar-derived digital terrain models (DTMs) as a baseline for settlement pattern identification, we identified dozens of archaeological features not visible in the DTMs. The three study sites, Paso del Macho, Cerro Hul, and Xanab Chak are all located within a 2 km<sup>2</sup> triangle and appear to have occupations that range from the Middle Preclassic period (ca. 900 BCE) through the Terminal Classic period (ca. 900 CE). This poster presents our preliminary findings, including geospatial comparisons of settlement patterns, landscape use, and potential for year-round habitation. Confirmation of Preclassic ballcourts at both Paso del Macho and Xanab Chak, but not at Late Classic Cerro Hul, mirrors a spatio-temporal pattern identified elsewhere in the northwestern Maya area. The identification of a large central platform at Xanab Chak suggests it may have played an intermediary sociopolitical role between the largest Preclassic sites like Yaxhom and the smallest Preclassic sites like Paso del Macho in the Puuc, and has implications for modeling interaction networks in the region.

Parker, Glendon [163] see Buonasera, Tammy

**Parker, Katherine (University of Tennessee, Knoxville)**

[77]

*Heritage In Flux: Plantations, Palimpsests, and Clandestine Distillation*

Following the end of the Civil War, plantation landscapes in the South Carolina Lowcountry underwent dramatic changes that broke up massive, generational landholdings and upended centuries of exploitative economic systems. Moonshining provided a means for some former plantation owners to maintain possession of core properties, while providing a narrative of hardscrabble resilience that effaced the legacy of racial exploitation of their immediate pasts. Vacated plantation landscapes were likewise reimagined as historically vacant spaces, which aided in the creation of material and symbolic distance from racially charged pasts—a pattern that is broadly evident in revisionist Southern histories. This paper will consider the political economy of privilege that plantation owners-turned-moonshiners had while navigating these clandestine pursuits. Archival, spatial, and archaeological evidence will be used to explore the role of moonshining as means of mediating the rapidly changing Lowcountry landscape from a plantation economy to industrial timbering and railroad construction in the twentieth century.

Parrish, Deborah [21] see Carlson, Justin

**Parrott, Nathan (LHC), Armando Anaya Hernández (Universidad Autónoma de Campeche) and Kathryn Reese-Taylor (University of Calgary)**

[152]

*The Sakjol Marketplace of Yaxnohcah, Campeche, Mexico*

Ancient marketplaces serve as invaluable sources of information regarding the political-economic organization of archaeological sites. Marketplaces were important locations within ancient cities serving as nexuses of social, economic, and political interaction. There is a rich collection of ethnohistoric, linguistic, and pictorial evidence indicating the existence of precolumbian marketplaces within the Maya region. Despite this, extensive research focusing on ancient Maya marketplaces has only just begun to develop relatively recently. This paper focuses on an unusual double-plaza marketplace at the Maya site of Yaxnohcah, Campeche, Mexico, the range of marketplace activities that took place and the construction history of the plazas. Analysis of materials recovered has provided valuable insight into the activities of the marketplace, in particular evidence of late-stage lithic production, food preparation/vending, and cleaning practices.

**Parsons, Ted (University of Alaska, Anchorage)**

[69]

*Recent Developments in Small and Low-Cost 3D Scanning Systems*

This poster examines the development of new, highly portable, entries into the short-range (~5 m) scanning arena use lidar sensors in recent iPhones and iPads and how they impact archaeological data collection. Previous small 3D capture systems included specialized Google and Sony smartphones, and the moderately expensive DotProduct DPI-8X handheld scanner. The study evaluated two professional-grade scanning applications, namely the Recon-3D and Dot3D for iOS. They use the Apple augmented reality development kit combined with conventional photogrammetry derived from iPad/iPhone RGB cameras to produce aesthetically pleasing, precise scans, in near real-time. The output of each scanning system is compared to an Agisoft Metashape Professional photo model of the test object and preliminary results are presented.

**Pascali, Pamela (Idaho State University), Kirsten Green Mink (Idaho State University) and Jaime Awe (Northern Arizona University)**

[72]

*Archaeo-tourism and Heritage Policies: What Works, What Doesn't, and How to Move Forward—Case Studies from Belize and the United States*

Archaeological sites in the United States are governed by a complex network of state and federal regulations, sovereign tribal governments, and private landowners. This often leads to difficulties managing access to heritage sites and their research potential. In contrast, extant literature describes the efforts of the Belize Institute of Archaeology and the country's Tourism Development Project as having been extremely successful in preserving archaeological sites, increasing tourism, and creating revenue to fund heritage management projects. However, if we were to look at both nations' policy frameworks regarding archaeological sites, we would expect to find that each comes with unique benefits and consequences. Using multiple case studies, this research seeks to understand how differing policies enacted by their governments impact artifact collection, conservation/preservation, and education. While acknowledging that this is a complex issue informed by policies that are historically rooted in the colonizer's perspective in the governments of the United States and Belize, we also hope to find that the gap between the cultural importance and academic interests within the United States could be bridged by adopting a more cohesive policy structure between heritage management, Indigenous stakeholders, and national institutions.

**Pascual Soto, Arturo (Instituto de Investigaciones Estéticas UNAM)**

[11]

*Comercio y cultura en El Tajín de los primeros años del Epiclásico*

La historia de los primeros años del Epiclásico (ca. 750–850 dC) en El Tajín, Veracruz, no es sólo la historia de esta antigua ciudad. Hay toda una serie de factores que participan de ella en distintos momentos de su desarrollo cultural. Varios de ellos se relacionan con acontecimientos que ocurrieron en otros lugares de Mesoamérica pero que tuvieron efectos concretos en el modo de vida de El Tajín. Las rutas comerciales del Clásico tardío, aquellas que habían servido para llevar a la ciudad grandes cantidades de obsidiana o el mismo jade venido del área maya, corresponden a un arreglo comercial que cruzaba los territorios de otros pueblos. Los mercaderes de El Tajín se internaban hasta la cuenca del río Papaloapan y allí tenían contacto con los productos venidos del oriente de Mesoamérica. Hoy sabemos que los “panecillos” de pintura azul usados en los murales procedían de Yucatán y que la concepción maya sobre la muerte no difiere de la que podemos observar en las tumbas de los gobernantes de esta época. La ponencia explora un modelo cultural del que participó El Tajín y que se extendió hasta el área maya siguiendo la costa del Golfo de México.

**Paskulin, Lindsey (University of British Columbia), Aleksa Alaica (University of British Columbia), Lindi Masur (Sewanee: The University of the South), Edward Swenson (University of Toronto) and Camilla Speller (University of British Columbia)**

[208]

*Taking a Closer Look: Biomolecular Insights to Foodways among the Moche of North Coastal Peru*

Cuisine is essential in the construction and maintenance of local and individual identity. At the Late Moche (600–900 CE) ceremonial center of Huaca Colorada on the north coast of Peru, a rich macrobotanical and zooarchaeological assemblage suggests a cuisine reflective of the region's environmental diversity. Dominated by maize cultivation and camelid herding, these macroscopic lines of evidence attest to deeply rooted local foodways. Nevertheless, questions remain concerning how individual foods were combined and prepared in the formation of cuisine. Local communities in Jequetepeque Valley operated within interregional networks, connecting the valley with communities along the coast and into the highlands. Communities within these networks wove together internal and external influences across time and space in the creation of local identity. Considering cuisine as one expression of identity, our research seeks to reconstruct past recipes through the analysis of ancient proteins preserved in ancient cooking pots (ollas). We apply shotgun proteomics—a method of ancient protein analysis—for the identification of plant and animal food-derived proteins in pottery residues from Huaca Colorada. As a complement to other forms of analysis, including

archaeobotany and zooarchaeology, proteomics can contribute to understandings of cuisine through interpretations of food preparation and cooking.

Pastore, Arielle [248] see Boyer, Cassandra

**Patch, Shawn (New South Associates Inc.)**

[162]

*Chair*

**Patch, Shawn (New South Associates Inc.)**

[162]

*Cemeteries of Enslaved Communities in Granville County, North Carolina*

Lewis and Elmwood cemeteries are the final resting places of enslaved individuals from two antebellum plantations in Granville County, North Carolina. Archaeological investigations show both cemeteries share many of the characteristics typical of Black cemeteries beginning in the antebellum era and continuing into the postbellum period. In much of North Carolina, generally, and Granville County, specifically, cemeteries are the only tangible properties associated with the Black experience. This presentation will discuss Lewis and Elmwood cemeteries, an historic context for interpretation, the potential for identifying more cemeteries, and offer suggestions for preservation efforts, including listing in the National Register of Historic Places.

**Paterson, Alistair (Uni of Western Australia)**

[190]

*Voyages to Kaju Jawi: First Dated Evidence for Seventeenth- and Eighteenth-Century Asian Voyages to Northern Kimberley, Australia*

In recent centuries, Southeast Asian commercial trepang (sea cucumber) traders established seasonal outposts on the shores of the coasts and offshore islands of northern Australia. This southernmost extremity of a network of maritime trade and travel connected Australia and Aboriginal Australia to people from Southeast Asia and indirectly to emerging global marketplaces. The archaeological evidence for these events has been documented for the Northern Territory and Gulf of Carpentaria; but the vast Kimberley region of northwest Australia has never been archaeologically dated. This presentation describes fieldwork (2019, 2021) at Napier Broome Bay and Niawalarra Island, the first excavations at three Asian trepanging sites, and provides the first regional dating sequence for Asians on the Kimberley coast. These dates reveal that Asian fleets were present here prior to and concurrent with European (Dutch, French, and British) explorers. The forms of encounter between Aboriginal people and these visitors is poorly known, however this project allows us to propose a model for the forms of cultural encounter and exchange. The “Coastal Connections” project was funded by the Australian Heritage Grant and an ARC Future Fellowship, and involved the Department of Biodiversity, Conservation and Attractions; Western Australian Museum; and Ballangarra Aboriginal Corporation.

Patterson, Alexander [135] see Reinhart, Katharine

**Patterson, Erin (Tulane University; Louisiana State Museum)**

[175]

*The Impact of Settlement Patterns on Health and Diet: Differences in Skeletal Pathologies and Stable Isotope Values at La Corona and El Perú-Waka', Guatemala*

Ancient Maya settlement patterns and density have come into focus thanks to site survey and, more recently, extensive lidar mapping. Settlement density zones suggested by recent investigations in northwest Petén, Guatemala, allow for interpretation of areas of higher and lesser settlement density and the comparison of

those groups between sites of different scales. This paper presents data from a diverse skeletal sample at the sites of La Corona and El Perú-Waka'. El Perú was a large city with a dense, nucleated urban core while La Corona was a much less densely populated center. This research explores differences in rates of skeletal pathologies and stable isotope values to understand stress and access to food resources in urban versus nonurban communities. The results are integrated with existing knowledge about local resource management and subsistence practices to reconstruct health and diet in the Classic period Maya Lowlands.

Patterson, Neil, Jr. [16] see Witt, David

**Patton, Katherine (University of Toronto) and Krista Maxwell (University of Toronto)**  
**[211]**

*Unsettling the Classroom: Teaching Archaeology's Ties with Settler-Colonialism*

For well over a decade, archaeologists such as Pyburn (2005) and Arnold (2005) have highlighted the need for teaching to engage with the larger, core issues that shape our research. Nevertheless, high-profile archaeological conversations about decolonization have tended to focus exclusively on research theory and practice. Yet Atalay (2019) and Cobb and Croucher (2020) have argued that important curricular and pedagogical changes also need to occur. In other words, significant disciplinary change means bringing research and teaching into conversation. How do we do this effectively? In this presentation, we outline our experience teaching a four-fields anthropology course entitled Anthropologists and Indigenous Peoples in North America at the University of Toronto that examines archaeology and anthropology's historical and ongoing links with settler-colonialism. Through guest lectures by Indigenous academics and community leaders, readings by Indigenous scholars, and in-house lectures, we introduce students to anthropology's complex ties with settler-colonialism, contemporary examples of Indigenous challenges to the discipline, and hopeful prospects for collaboration. We present the course successes, problems that we encountered, and how we plan to move forward with it in the future.

Patton, Natalie [214] see Burke, Chrissina

Paula Moraes, Claide [150] see Shock, Myrtle

Paulay, Gustav [71] see Pluta, Paul

**Paulette, Tate (North Carolina State University)**  
**[222]**

*Beer and the Politics of Affect in Mesopotamia*

Many early states were deeply invested in alcoholic beverages. In focusing on the political instrumentality of these beverages, however, archaeologists have often lost sight of what makes them such an effective tool of statecraft. People seek out alcoholic beverages because of their affective power, their ability to transform people, places, atmospheres, and events. In this paper, I consider the politics of affect and the enduring connection between alcohol and the state-making project. I argue that alcohol has long served as an affective technology, a means of intervening in the affective domain. As a case study, I explore the evidence for beer in early Mesopotamia. A fundamental element in the state-making arsenal, beer was recognized to produce distinctive effects on imbibers, but this affective dimension has often been sidestepped in the archaeological literature. First, I consider Mesopotamian perspectives on the effects of beer consumption, as articulated in the cuneiform record. Second, I examine five key parameters and five associated concepts that take us beyond the discursive representation of beer consumption. I hope that the roadmap laid out here will help to spark deeper archaeological engagement with the affective dimensions of alcohol consumption and the politics of affect.

Paulette, Tate [49] see Grossman, Kathryn

**Paulson, Kirsten****[145]***Lithic Technologies and Faunal Remains From a Terminal Pleistocene Pit Feature at Cooper's Ferry, Idaho*

A new study at the Cooper's Ferry site (10IH73) located in west central Idaho focuses on the contents of pit feature 110 of Area B. Feature 110 (F110) has been dated between  $\sim 9938 \pm 36$  BP (11,352–11,264 cal BP) and  $\sim 9867 \pm 36$  BP (11,278–11,223 cal BP) and contains WST points, debitage, and faunal remains. Notably, the F110 faunal record includes a burned canid cranium, a canid mandible, and a second unburned canid cranium fragment, indicating the presence of at least two canids within the feature. Lithic and faunal analysis provides insights into WST technological patterns, and I present the results of morphometric analysis to assess whether the canid remains represent domesticated dogs or other canids. I discuss the implications of these findings in the context of other late Pleistocene human-animal interactions in North America in order to better frame our understanding of the WST lifeway.

Pavão-Zuckerman, Barnet [190] see Walker, Cameron

Pavlik, Bruce [140] see Louderback, Lisbeth

**Pawlowicz, Leszek****[69]***Methods for High-Resolution Visualization of 3D Surfaces*

Modern methods of 3D characterization, like photogrammetry and structured light scanning, can capture high-resolution models of inscribed surfaces. Visualization and enhancement of surface details on these models can be limited by the computational requirements for manipulating high face and vertex counts. We present several methods for working around these issues and obtaining visualizations that can reveal subtle surface details. Examples presented include inscribed Mayan monuments from Xunantunich and Lamanai in Belize, and petroglyphs from the American Southwest.

**Payntar, Nicole (University of Texas, Austin)****[250]***A Multi-temporal Analysis of Archaeological Site Destruction Using Landsat Satellite Data and Machine Learning, Moche Valley, Peru*

The destruction of archaeological sites and the loss of archaeological landscapes remains a global concern as populations and urban areas continue to expand. Archaeological sites are not only significant to local communities, national identities, and modern tourist economies but also provide critical knowledge of past sociocultural interactions, settlement patterns, human-environment relationships, and risk mitigation strategies. While archaeological landscapes and site destruction have remained outside of traditional land-use, land-cover change (LULCC) studies, they are a form of urban and agricultural land use. By conceptualizing archaeological site destruction within land-change science, this study provides an innovative approach for assessing “what’s left” of historically surveyed archaeological landscapes. Using a Random Forest algorithm and Landsat satellite data, this study quantifies archaeological site destruction attributed to LULCC in Peru’s lower Moche Valley between 1985 and 2020. Over 400 archaeological sites previously recorded during the Chan Chan-Moche Valley Project (CCMVP, 1969–1974) are analyzed. Results indicate that less than a quarter of the original CCMVP sites remain on the landscape. The primary drivers of LULCC in the lower Moche Valley include population growth, migration, and government policies, while secondary drivers include heritage values.

**Pazmiño, Estanislao (Yale University)****[36]***Clouds for Water, Forest for Healing: Prehispanic Cultural Dynamics in the Cloud Forests of the Northern Andes*

The cloud forests along the eastern and western foothills of the northern Andes have received little attention in the overall archaeology of South America. These regions of broken geography and dense forests have

historically been considered culturally poor, with little impact on the sociocultural transformations of the Andean and coastal populations. However, numerous ongoing studies are shedding light on our understanding of the bubbling cultural interactions that took place in these areas. The continuous interaction with the populations of the highlands and lowlands, as well as a complex management of the forest and water sources, in some cases seem to have led to the emergence of large prehispanic settlements that transformed these landscapes and the ways of interacting with them. This paper aims to expand the discussion on the role of cloud forests as mediation spaces as well as cultural sources for the prehispanic populations of the Andean highlands and tropical lowlands of Ecuador.

Pearce, Kenny [6] see Filoromo, Steve

Pearson, Charlotte [74] see Larrick, Dakota

**Pearson, Kristen (Harvard University)**  
**[244]**

*Following the Felt: Object Trajectories and Gendered Social Networks in Contemporary Western Mongolia*

Archaeologists have suggested that investment in flexible and spatially extensive social networks helped sustain mobile pastoralist communities and states in the past. This study explores the material dimensions of such social networks through an investigation of household textile exchange among contemporary herders in Western Mongolia. Today, Kazakh Mongolian women produce felt carpets (*syrmaq*) to give as gifts to each of their daughters' husbands' close relatives—an obligation that can require years of crafting and collecting. The formal exchange of felt carpets is often preceding by earlier exchanges of labor and raw material within womens' informal social networks. The carpets displayed in the yurt (*kiiz yi*) thus reflect womens' shifting positions in multigenerational households as well as their involvement in varied social relations—with their natal families, with their husband's relatives, with neighbors and friends. By mapping the social and spatial trajectories of these objects through time, this study aims to identify patterns in material culture distribution of use in archaeological interpretation. It also highlights women's skillful management of social relations as a key factor in the resilience of mobile pastoralist lifeways past and present.

Pecci, Alessandra [25] see Moragas, Natalia

Pecci, Alessandra [189] see Torras Freixa, Maria

**Peck, Katherine (University of New Mexico)**  
**[176]**

*Automating Archaeological Feature Detection: Unsupervised Classification and Feature Extraction from Satellite Imagery*

Satellite and aerial images are used for archaeological site prospection worldwide. However, manually detecting and mapping archaeological sites from imagery can be time consuming. This poster examines the utility of an image processing and unsupervised classification procedure for archaeological feature detection and mapping in arid settings. This procedure, built in Python, utilizes several geospatial analysis modules to read in, process, and classify raster images of archaeological sites. Features are detected and vectorized, and accuracy can be optionally assessed by the percentage of the total length of previously mapped features captured for a given image area. This tool is tested on Google Earth images of ancient agricultural fields, focusing on features in arid settings with little vegetation (leeward Hawai'i Island, US Southwest). There are currently several limitations to this tool, namely false positives. However, the tool is extendable and could be applied to different archaeological feature types in different geographic areas. Although this tool requires additional refining, the accuracy at this stage suggests the potential utility of unsupervised classification for automated archaeological feature detection.

Peck, Katherine [69] see Graves, Michael

Peck, Katherine [99] see Vallejos, Joshua

Pedro, Karl [181] see Duwe, Samuel

**Pedroza, Berenice (Escuela Nacional de Antropología e Historia), Luis Velázquez-Maldonado (Colegio de Michoacán), Fernando May (Colegio de Michoacán), Blanca Maldonado (Colegio de Michoacán) and David Larreina-Garcia (UPV-EHU: University of the Basque Country)**

[13]

*Análisis morfológico y químico de escorias de cobre del sitio Jicalán Viejo, en el Occidente de México*

Este trabajo presenta los avances de la clasificación morfológica, caracterización química elemental (pXRF), y microscopía estereoscópica y óptica de las escorias de cobre recuperadas entorno a las áreas productivas del sitio Jicalán Viejo, Michoacán, México. El objetivo principal es presentar un catálogo de escorias con fotografías de las características macroscópicas y microscópicas de éstas, así como las descripciones de sus propiedades físicas y químicas; atributos que podrían ayudar a arqueólogos y geólogos a identificar escorias con potencial interés en campo. Los datos obtenidos por análisis arqueometalúrgicos compilados aquí proporcionarán información esencial para investigadores en el laboratorio y se cotejarán con el estudio analítico más exhaustivo que se está realizando mediante microscopía y que comprende no sólo las escorias sino también los restos de hornos de reducción, así como otros materiales técnicos relevantes, están en proceso de investigación.

Pedroza, Berenice [125] see Maldonado, Blanca

Pedroza, Berenice [13] see Velázquez-Maldonado, Luis

**Peeples, Abigail (National Park Service, Lake Mead National Recreation Area)**

[45]

*Chasing Trail: Documentation and Management of Precontact Trails within Lake Mead NRA*

Archaeology at Lake Mead National Recreation Area (NRA) has primarily focused on areas where the Section 106 process has required survey such as areas subject to inundation from Lakes Mead and Mohave, as well as developed areas. This has led to only 5% of the 1.5 million acres that make up Lake Mead NRA being surveyed. Included in the previously surveyed land are Precontact trails that have been partially recorded. Other trails have been identified through aerial maps or from Tribal members. Trail systems while known to be located throughout the park, have not been well researched to understand the people that traveled across or alongside the Colorado River that is located in what is now the boundary of Lake Mead NRA. This presentation examines the few trails that have already been identified within the park and surrounding area as well as management challenges we face with a linear site that spans multiple land jurisdictions. The goal of documenting the trail is to contribute to future ethnographic studies to provide a better understanding as to how these trails and surrounding landscapes were utilized.

**Peeples, Matt (Arizona State University), Robert Bischoff (Arizona State University) and Daniel Hruschka (Arizona State University)**

[73]

*The ArchaMap Data Integration Tool: A Case Study from the Roosevelt Dam Archaeological Projects, Arizona*

Archaeological data are complicated and rarely highly standardized between projects. Using data from multiple sources often requires a time-consuming and difficult process of mapping data ontologies, categories, recording schema, and contextual information among projects manually. This work is error prone and it is difficult to document substantive decisions and translations made. In this poster we present ArchaMap, an open source tool designed to aid in the integration of multiple complex datasets with different sources and ontologies. ArchaMap is an R Shiny Application and graphical user interface designed to save time, increase

consistency, and document complex data merging processes among multiple sources. Importantly, this online platform stores and suggests past translations to build an ever-expanding list of associations to aid in connecting categorical data across different sources. In this poster, we use data from two large projects conducted simultaneously around Roosevelt Lake, Arizona (Roosevelt Community Development Project and Roosevelt Platform Mound Study) to demonstrate the tremendous time-saving potential for standardizations of material culture data. These projects were conducted in the same region at the same time but they were conducted by different institutions with different procedures and data structures so the data have not previously been compatible.

Peeples, Matt [95] see Hruschka, Daniel

Peeples, Matt [60] see Mills, Barbara

Pelache, Jennifer [21] see Rowe, Robert

### **Pelaez-Ballestas, Ingris**

**[200]**

*Chair*

### **Pelaez-Ballestas, Ingris, Karla Rodríguez-Rodríguez (INAH-Michoacán), Miguel Ibarra López (INAH-Michoacán), Patricia Rodriguez (Hospital General de México “Dr. Eduardo Liceaga”) and Carlos Karam-Tapia (INAH-Michoacán)**

**[200]**

*Bioarchaeology of Care of Fishing Community at Tzintzuntzan, Western Mexico: A Multi-method Approach*

Otitis and mastoiditis are conditions that produce deafness and disability in the pre-antibiotic era, especially in the fishing community. This study describes lesions on temporal bones in the Western Culture from Mexico living near Lake Pátzcuaro, Michoacán. A sample ( $n = 41$ ) of temporal bones from Tzintzuntzan sites was analyzed by a multidisciplinary team (physical anthropologist, archaeologist, radiologist). We used different methodologies: osteological morphofoscopy evaluation, multiple computed tomography scanning, virtual reconstruction 2D and 3D, which followed index of care protocols. All evaluations were double-blinded with a previous standardized process. The lesions observed by all methods are compatible with the diagnoses of chronic otitis and mastoiditis (73.1%, 30/41), which could produce a hearing impairment. The combination of multiple methodologies and a multidisciplinary team of evaluators improved the likelihood of classification of lesions. The frequency of these lesions is high in fish stocks such as the site of Tzintzuntzan; this could lead to significant hearing impairment in these communities affecting their performance in everyday life.

Pelton, Spencer [170] see Kelly, Robert

### **Peltzer, Summer, Kaley Kelly (EPG, a Terracon Company), Ryan Arp (EPG, a Terracon Company) and Christopher Schwartz (EPG, a Terracon Company)**

**[72]**

*Ground Stone Analysis from West Phoenix Basin Hohokam Village Sites*

To date, much of the archaeological research in the Phoenix Basin has focused on the central Phoenix area, and specifically the areas surrounding Canal Systems 1 and 2. Recent cultural resource management testing and excavation projects in the west Phoenix area have provided new insights into Hohokam daily life at the confluence of the Salt and Gila Rivers. This area was densely populated with evidence for agriculture and craft production that differs from well-studied patterns observed in the central Phoenix area. CRM projects in this area focused on household archaeological contexts, including the production and use of ground stone tools. In this poster we present results of ground stone analysis from the Preclassic Hohokam village sites of AZ

T:11:39(ASM)/Cashion and AZ T:12:9(ASM)/Villa Buena in the western portion of the Phoenix Basin. We also examine ground stone tools from AZ U:9:67(ASM)/La Lomita located within Canal System 2 in the central Phoenix Basin, and use this settlement as a point of comparison.

Peña, José [28] see Singletary, Jennifer

**Penados, Filiberto (Galen University)**

[39]

*Discussant*

**Peng, Fei (Minzu University of China)**

[159]

*From Zhoukoudian to Shuidonggou: The 100-Year Improvement of Paleolithic Excavation in China*

For field excavation, it is most important to record and collect as much information as possible due to its non-repeatability. In China, the first formal Paleolithic excavation was in Shuidonggou site on 1923. But the excavation in Zhoukoudian in 1932 attracted more attention not only because the site was located in Beijing and several human skulls were unearthed but also due to the innovation of excavation method and design. After that, Chinese scholars adopted different methods and protocols at different time. This paper introduces the improvement of Chinese Paleolithic excavation and rethinking the progress. Meanwhile, the future direction of Paleolithic fieldwork in China is discussed.

**Peng, Peng**

[66]

*On the Origins of Metalworking in China: Technology and Art*

The “independent invention versus diffusion” argument remains undecided regarding the inception—or rather inceptions—of copper-based metallurgy in China. The intriguing course leading to the substantial rise of a distinctive metallurgical tradition that can be confidently called “Chinese” was probably too perplexing to be explained by a single theoretical model. Even we choose to follow metallurgical diffusionism in understanding the case of early China, presumably two mechanisms of technological transmission existed simultaneously. One, was in the small-scale and irregular transregional communications of long standing, involving many cultural groups in China, the arc, Inner Asia, and southern Siberia. The other was rapid, direct, and long-distance transmission, represented by the diffusion of the Seima-Turbino metalwork. The current paradigm, unfortunately, still has difficulty explaining the isolated metal “alloys” from Middle Neolithic China, such as the fifth-millennium copper-zinc anomaly witnessed at Lintong Jiangzhai, Shaanxi province. If such incredible discoveries could finally be authenticated, that strange beginning in metal supposedly had little, if anything, to do with the rest of the story (or a new story?) of Chinese metallurgy as a persistent endeavor; taking all things into consideration, the prehistoric “brasses” probably had nothing to do with, for example, the splendid Bronze Age of China.

**Pengilley, Alana (University of Texas, Austin) and Fred Valdez (University of Texas, Austin)**

[154]

*It's What's on the Inside That Counts: New Approaches to Sourcing Mayan Chert Artifacts from Belize*

The distribution of prehistoric artifacts across spatial and temporal realms is frequently used to investigate trade, exchange, mobility, and socioeconomic relationships in the past. In the Maya region, chert was a key component in ancient toolkits due to its widespread availability and suitability for knapping into tools. Previous studies in the Maya region focused on the identification of particular chert types relying on visual properties alone. While a useful technique, the results are often too dependent on the identifier's expertise rather than quantifiable and measurable attributes, thus driving new research for novel and innovative

methods in chert source identification. We discuss preliminary results of a new methodology using a combination of microscopic and geochemical analyses on geological samples from northern Belize for sourcing chert. The ability to source chert artifacts provides insights for understanding how the ancient Maya interacted with and procured raw materials and the movement of chert artifacts through trade and exchange networks.

**Pennanen, Kelsey (University of Calgary), Peter Dawson (University of Calgary) and Christian Thomas (Yukon Government)**

**[63]**

*Aerial Mapping Approaches for Long-Term Monitoring of Heritage Landscapes Impacted by Climate Change*

There is a strong need to document heritage landscapes impacted due to rapidly changing climates in Canada. This paper presents two case studies about using UAV-based technology to better understand landscapes impacted by climate change. Both examples use UAV photogrammetric methods to monitor large and complex archaeological heritage sites. The first case study applies noninvasive UAV-based change detection for the long-term monitoring of erosional processes. This was conducted at a threatened buffalo jump site over a period of four years. Located in traditional Blackfoot territory, the site is being impacted by increased flooding events in Southern Alberta's foothills. The second example comes from the rapidly melting and changing ice patch landscapes of Yukon's subarctic high alpine. Here ice melt at ancient high-elevation gathering places is revealing archaeological objects, ancient trails, and hunting features, which are being documented using a UAV-photogrammetric approach. As community-oriented research, this work combines traditional knowledge, spatial mapping, and digital storytelling practices conducted together by researchers, Yukon government employees, and local First Nations youth, Elders, hunters, and land stewards of the Carcross/Tagish First Nation, Champagne and Aishihik First Nations, and the Kwanlin Dün First Nation.

**Pennington, Meagan**

**[101]**

*Age Estimation Using Dental Development and Long Bone Length for the Children in the Late Classic Copan Maya Civilization*

Childhood growth and development remains difficult to estimate in past populations, yet, it provides a unique window into childhood experiences in prehistory. This study considers subadult skeletal remains estimated to be 1–21 years of age at the time of death from the ancient Maya population in Copan, Honduras based on the end of the eruption/development of the third adult molar. The 85 subadult remains reveal the experience of the children which remained understudied, in part due to the poor preservation of subadult remains. Researching the experiences of children and childhood growth and development in the ancient Maya society helps illuminate an often-forgotten social group. Skeletal data used compares age estimates derived from dental development and eruption to those of long bone lengths to see if the resultant age ranges are equivalent. Observing similarities or differences between these methodologically distinct age estimations highlights (1) how factors like disease, trauma, or inequality are embodied during childhood affecting the growth and development of dental and skeletal tissues; (2) if there are bias or observation error in age estimates depending on the method utilized; (3) and provide methodological tools to increase the accuracy and precision of age estimation among prehistoric and historic indigenous populations.

**Perdikaris, Sophia (University of Nebraska, Lincoln) and Edith Gonzalez (SUNY, Buffalo)**

**[16]**

*Cultural Heritage Landscapes Post-disaster in Barbuda, Lesser Antilles*

In this presentation, we will examine Barbuda's landscape from a diachronic perspective. The ongoing tension between multiple man-made and natural disasters and a resilient people have successively modified Barbuda's environment from the earliest peopling at 5000 BP extending to the present day. Big weather events, political agents of change, and the responses of Barbudans to them, call into question the effects these changes have on the memory, identity, and legacy of a people.

Pereira, Thiago Umberto [46] see Bond Reis, Lucas

Pereiro, Tiago [95] see Dias, Rita

Perera, Lucy [73] see Thornton, Erin

Perera, Nimal [210] see Dussubieux, Laure

**Peresolak, Katherine (Student Conservation Association/DCNR)  
[18]**

*Stewardship and the Efforts to Preserve the Carroll Cabin*

The Carroll Cabin is a late eighteenth-century hand-hewn log home with extant mid-nineteenth-century addition located on State property in Westmoreland County, Pennsylvania within Forbes State Forest. Since the donation of the home and surrounding property, the Department of Conservation and Natural Resources (DCNR) has partnered with several individuals and groups to further their understanding and stewardship of the historic resource. Work at the home has, thus far, included metal-detector survey, the speaker's thesis research, and a training-based workshop weekend in preparation for the home's short-term stabilization. A preservation plan has facilitated continued preservation progress and has so far resulted in a building clean-out, planned ground-penetrating radar (GPR) survey, and a fall 2022 archaeological survey ahead of long-term stabilization and rehabilitation efforts. The partnerships formed during these projects have been instrumental in continuing preservation efforts and championing the stewardship ethic. Both the preservation journey and final goals for the Carroll Cabin have and will continue to positively impact all who are involved and hopefully will exemplify a series of best practices transferrable to other historic state-owned properties.

Peresolak, Katherine [18] see Jaillet-Wentling, Angela

**Perez, Daniel (University of Nevada, Las Vegas)  
[78]**

*Discussant*

**Perez, Daniel (University of Nevada, Las Vegas)  
[161]**

*An Evaluation of Virgin Branch Social and Political Complexity through Painted Ceramic Design and Style*

Social complexity in prehispanic societies within the North American Southwest has been studied through a variety of research avenues. Among the Virgin Branch people within the Moapa Valley of southern Nevada, archaeologists have pursued this topic through the study of architecture, burials and associated grave goods, and exchange networks. Among Virgin Branch archaeologists working in the Moapa Valley has been the competing notion of whether Virgin Branch society was egalitarian (Lyneis 1992) or ranked (Rafferty 1990). This study revisits this long dormant debate through the lens of a research medium not previously used to explore the nature of Virgin Branch social complexity—namely, painted design and style complexity on pottery. Inspired by a cross-cultural study conducted by Peter Peregrine (2007), this paper presents an exploratory assessment of Virgin Branch social complexity, through an adaptation of Peregrine's (2007) methods, using painted ceramics recovered from Adam 2 and the Main Ridge community. This study uses a comparative statistical approach to evaluate social complexity at Adam 2 and the Main Ridge community against Peregrine's (2007) findings as a means of assessing the utility of this analytical approach to the study of

social complexity in the Virgin Branch region.

**Perez, Stefanie (New South Associates Inc.)**

[120]

*Discussant*

Pérez-Martínez, Patricia [241] see Menéndez Iglesias, Beatriz

**Perez Rodriguez, Veronica (University at Albany, SUNY)**

[91]

*Investigating Public Spaces at the Urban Center of Cerro Jazmín, Mixteca Alta, Oaxaca*

The paper presents recently recovered information from excavations conducted in public spaces and open areas in the Late to Terminal Formative city of Cerro Jazmín in the Mixteca Alta region of Oaxaca. An area thought to be a plaza located directly south to a three-mound complex (Tres Cerritos) revealed a series of constructions and enclosures that contained oven features, middens, and funerary constructions and deposits that suggest that these spaces served multiple functions, some of which pertained to funerary rites, foundational rituals, and public food preparation and consumption events. In addition, the results of an analysis of ceramic and lithic materials associated with the ovens and nearby middens are presented to propose that the area also served as a place of production. But, what kind of production is still to be seen? By integrating artifact, architectural, and mortuary data the paper will discuss what activities and functions took place in this centrally located place. Finally, by comparing the Cerro Jazmín findings with what is known from other contemporary Mesoamerican urban centers, the paper will discuss how public spaces are built, used, and transformed to support or redirect sociopolitical strategies aimed at establishing or solidifying cities and their social fabric.

Perreault, Charles [137] see Paige, Jonathan

**Perri, Angela (Texas A&M University)**

[245]

*Chair*

**Perri, Angela (Texas A&M University)**

[245]

*Dog Domestication and the Dual Dispersal of People and Dogs into the Americas*

Advances in the isolation and sequencing of ancient DNA have begun to reveal the population histories of both people and dogs. Over the last 10,000 years, the genetic signatures of ancient dog remains have been linked with known human dispersals in regions such as the Arctic and the remote Pacific. It is suspected, however, that this relationship has a much deeper antiquity, and that the tandem movement of people and dogs may have begun soon after the domestication of the dog from a gray wolf ancestor in the late Pleistocene. Here, by comparing the population genetic results of humans and dogs from Siberia, Beringia, and North America, we show that there is a close correlation in the movement and divergences of their respective lineages. This evidence places constraints on when and where dog domestication took place. Most significantly, it suggests that dogs were domesticated in Siberia by ~23,000 years ago, possibly while both people and wolves were isolated during the harsh climate of the Last Glacial Maximum. Dogs then accompanied the first people into the Americas and traveled with them as humans rapidly dispersed into the continent beginning ~15,000 years ago.

**Perrotti, Angelina (Brown University; University of Wisconsin, Madison) and Ryan Duggins (Florida Bureau of Archaeological Research)****[197]***Evidence of Mid-Holocene Environmental Change at the Submerged Archaeological Site, Manasota Key Offshore, Florida*

The Manasota Key Offshore (MKO) site is submerged under the gulf of Mexico off the shore of Manasota Key, Florida. This site, which was occupied over 7,000 years ago, provides a unique opportunity to investigate the effects of early Holocene environmental change on hunter-gatherers, particularly relating to sea-level rise. This poster presents preliminary results for an extensive palynological analysis including fossil pollen and non-pollen palynomorphs at MKO. First, the resulting paleoenvironmental reconstruction provides critical information for interpreting archaeological evidence for cultural change in the context of environmental change. Then, we explore various methods for interpreting archaeological and paleoenvironmental data from the same site. In conclusion, this work at MKO provides both invaluable archaeological and paleoenvironmental data in conjunction with recommendations for future paleoenvironmental research at submerged archaeological sites.

**Perry, Elizabeth (Crow Canyon Archaeological Center)****[90]***Discussant***Perry, Gabrielle, Raymond Mueller (University of Stockton), Arthur Joyce (University of Colorado, Boulder) and Akira Ichikawa (University of Colorado, Boulder)****[127]**

*The Impact of Late Classic–Early Postclassic Anthropogenic Landscape Change in the Lower Río Verde Valley, Oaxaca*

Previous geomorphological data from the upper drainage basin of the Río Verde suggest that demographic and land-use changes, perhaps coupled with climate change, during the Classic period collapse (ca. 800 CE) increased erosion and sediment entering the drainage system. Recent geomorphological research in the lower reaches of the Río Verde in the Pacific coastal lowlands was designed to examine whether the changes in the drainage system effected floodplain environments. Previous geomorphological research showed that the lower Verde exhibited a braided morphology at the time of the collapse. Increased sediment load and runoff resulting from anthropogenic landscape change in the highlands would have increased channel migration, flooding, and alluviation and accentuated the braided morphology of the river. Recent soil augering on both sides of the Río Verde provide greater detail on the presence of both relict oxbow lakes and abandoned braided channels in the floodplain. In this paper we present our findings with spatial and temporal details that explore changing floodplain environments during the collapse of the Late Classic polity of Río Viejo. We consider the implications of our data for changes in agriculture and settlement on the floodplain with a focus on the urban center of Río Viejo.

Perry, Jennifer [42] see Banke, Peter

Perry, Jennifer [181] see Holguin, Brian

Perry, Megan [102] see Pink, McClean

Pestle, William [42] see Sabo, Allison

**Peters, Ann (University of Pennsylvania Museum)****[246]***Chair*

**Peters, Ann (University of Pennsylvania Museum)****[246]***The Body, the Regalia, the Weapons, and the Mortuary Bundle: Forms, Materials, and Uses of Cordage at the Paracas Site*

In study of Andean archaeological textiles, a focus on decorative “high status” objects too often produces a distorted vision of ancient textile traditions, obscuring the textile forms most commonly found in an excavated assemblage. Ethnoarchaeological study by Cases (2020) has begun to address this problem by looking at production contexts in both present and past Andean communities, where cordage plays a major role. Cordage is everywhere at Paracas, made from many different fibers and structurally diverse. The heavy cotton wrapping cloths that layer and shape each mortuary bundle are stitched and bound with plied cords. Aside from ubiquitous cotton and camelid hair—spun, plied, and re-plied into the structures studied by Splitstoser (2014)—special-purpose cords are made from reeds, animal sinews, bast fiber, and human hair employed at different scales for both pragmatic and decorative purposes. They compose and join a wide range of artifact components. In the interstices between wood, bone and stone, cloth and feathers, cane and fiber, hair and metal, or shell and skin, diverse forms of cordage play hidden roles to hold it all together. Perhaps for this reason, as Frame (1986, 1991) has noted, cord structures are represented on “high status” decorative objects.

Peters, Kenneth [66] see Wendt, Carl

**Peterson, Jenna (Bonneville Power Administration) and Kendra Maroney (Kalispel Tribe)****[143]***Outreach and Education: Examples from a Federal Agency*

As a federal agency, public outreach and education take many forms at the Bonneville Power Administration. Identifying and implementing effective mitigation requires meaningful and collaborative engagement with members of the public and consulting parties. Looking internally at our own workforce, many people are surprised that Bonneville employs archaeologists and historians, and we use this as an opportunity to share and celebrate our roles and the work that we do through internal presentations. Lastly, setting aside our day-to-day work, we participate in local events that further helps develop and strengthen our community partnerships. I look forward to sharing a few examples of how Bonneville Power approaches public outreach and education, and to learning how other organizations approach their work.

**Peterson, John (University of San Carlos Cebu), James Bayman (University of Hawai'i), Andrea Jalandoni (Griffith University), Maria Kottermair (University of Queensland) and Ashley Meredith (Federated States of Micronesia)****[49]***A Pattern of Islands: Ethnography, Remote Sensing, and Community Archaeology in Kosrae and Pohnpei, Micronesia*

Knowledge of navigation and island living among indigenous people of the western Pacific Ocean retain lifeways, legends, and oral history about their migrations in the region. Western enlightenment theories of Pacific migration persist in describing this migration as a wave or diffusion of peoples seeking new lands. However, among islanders, it is perceived as more of a mosaic or nodal pattern, with movement among islands connecting kin groups, fishing resources, or ritual exchange networks. The difference in these views of migration illustrates the divide between etic, western views and indigenous perceptions of space, time, and the islanders' sense of habitus. This project combines ethnographic encounters with data from UAS (unmanned aerial systems) and archaeological observations with villagers in Kosrae and Pohnpei in the Federated States of Micronesia to assess the history and character of migration in the central western Pacific since founding populations have been first identified over 2,000 years ago. The results of the first year of a two-year project interrupted by COVID restrictions are presented.

Peterson, John [192] see Dunning Thierstein, Cynthia

**Peterson, Katherine****[50]***A Linguistic Approach to Architecture: Geosemiotics and Performativity of the Built Environment*

In this paper, I argue that architecture, like language, is symbolic and communicates meaning. Therefore, architecture can be interpreted linguistically. The architecture in the ancient Southwest is no exception. Buildings were designed, built, and used with meaning. Using the theoretical frameworks of geosemiotics and performativity, I will illustrate that architecture comprises many features like language and that place indexes meaning. I draw on examples across space and time to demonstrate these concepts. Then, I apply these concepts to the architecture found at Chaco Canyon in New Mexico. There is so much being communicated through the built environment and linguistics provides viable tools that can aid in the interpretation of that information.

**Peterson, Ryan****[104]***Bethel Cemetery Reburial, Agency, and Stakeholder Coordination*

The Bethel Cemetery excavation required extensive coordination with a number of agencies. Both the Division of Historic Preservation and Archaeology (SHPO) and the State Revolving Fund provided regulatory oversight. The scientific investigation was completed under Section 106 of the NHPA and Indiana Code (14-21-1), which allows for the archaeological relocation of human remains that predate January 1, 1940. While not specifically required under the law, extensive efforts were made to engage descendants, veterans' groups, the preservation community, and other interested parties. Outreach culminated with a rededication ceremony at Concordia Cemetery, the new resting place of those interred in the Bethel Cemetery. The cemetery was reconstructed in a compressed space but remained respectful of family groupings. When possible, burials with monuments that were damaged or buried were re-associated with the proper grave. In some cases, the identities of individuals in unmarked graves could be determined. Graves of the unidentified were provided with markers with unique identifiers that correspond with the report, so that in the future family members and researchers will have access to the extensive information that was compiled for each burial. The project resulted in extensive documentation and research while maintaining the utmost respect for the deceased.

**Peterson, Ryan (Indiana University Bloomington)****[219]***Miskwabik's Journey beyond Minong: Copper Production Systems among Hunter-Gatherers in the Northern Lake Superior Basin 4,000–6,000 Years Ago*

Over the past 10,000 years, hunter-gatherers in the Lake Superior Basin have utilized primary and secondary deposits of native (elemental) copper in a production and exchange network that spanned across and beyond the North American Midcontinent. The production system that comprises the core of North America's Native Copper Industry is a system of continuous technological innovation whose size and antiquity supersedes other metal industries of similar antiquity around the globe. This paper will examine the organization of the copper production system in the northern Lake Superior Basin through the systematic research of copper production stages on sites across this region. This examination will detail the life history of the copper production process to demonstrate the technological innovations that allowed this industry to flourish. By understanding the step-by-step process of copper production among hunter-gatherers, a different discussion emerges on the complexity of metallurgy in the Lake Superior Basin over the past 10,000 years. This research pushes the current paradigm for understanding indigenous copper working in North America as a complex metallurgical industry that existed on a continental scale. Conceptualizing hunter-gatherer use of metals as an industry provides an important starting place to better understand one of the world's oldest metallurgical systems.

**Peterson, Veronica (Harvard University)****[188]***Moderator*

**Peterson, Veronica (Harvard University)****[208]***Developing a Culinary Archaeology Framework for Comparative Studies of the Chinese Diaspora*

In addition to being a primary concern for descendant community stakeholders, the identification of food ingredients, their supply, and their uses are an increasingly important avenue for investigating the health effects of labor and care practices in the late nineteenth- to early twentieth-century Chinese diaspora, especially for railroad workers and at other natural resource extraction sites. In the interest of exploring one type of labor or of one geographically bounded area, it is difficult to ascertain the influence of other cooking and eating experiences, even just within the United States, despite the growing recognition of Chinese transmigrants' circulatory mobility and diasporic experiences. This paper presents a preliminary analysis of the mixed material cooking-and-eating related assemblages from two sites in northern California (a boarding house in Sacramento and farm workers' housing in Amador County) that take circulatory mobility and extended community networks as a starting point. I draw on my embodied knowledge of Chinese American foodways and experimental archaeology to posit one potential pathway for a "culinary archaeology."

**Petras, Elysia (Temple University)****[126]***Chair***Petras, Elysia (Temple University)****[126]***Compositional Analysis of Low-Fired Coarse Earthenware Excavated Archaeologically from Two Anguillan Eighteenth- to Nineteenth-Century Plantation Sites*

This paper presents the preliminary results of neutron activation analysis (NAA) and laser ablation ICP-MS (LA-ICP-MS) conducted at the University of Missouri Research Reactor's Archaeometry Lab on coarse earthenware sherds recovered archaeologically from two plantation-era sites on Anguilla, the Wallblake Estate site and the Hughes Estate site. Using sourcing studies, this research investigates emancipatory social networks that enslaved and self-liberating individuals developed between the neighboring islands of British Anguilla and French/Dutch St. Martin/Martin.

Petrie, Cameron [142] see Green, Adam

Petrosyan, Artur [56] see Haydosyan, Hayk

Petrosyan, Artur [56] see Kovach, Tanner

Petrou, Eleni [122] see Kopperl, Robert

Petrou, Eleni [218] see Moss, Madonna

Petrou, Eleni [218] see Speller, Camilla

**Pettigrew, Devin****[232]***Treating Problems of Target Nonscalability in Archaeological Projectile Experiments*

Many controlled archaeological weapons experiments have used homogenous target simulants to answer a variety of questions. Target simulants, however, must be shown to be scalable for the weapons we study; they must be shown to capture the same characteristics that make weapons effective in their original application. This paper presents original research demonstrating that two frequently used flesh simulants, pottery clay and ballistics gelatin, are not scalable to animal tissues for low-velocity cutting/piercing projectiles, which perform very differently than bullets. This problematizes conclusions drawn from a number of previous experiments. Skin simulants tested without a target backing may provide a way forward, but these also come with challenges in material selection and target setup.

**Peuramaki-Brown, Meaghan (Athabasca University) and Shawn Morton (Northwestern Polytechnic)**

[115]

*Granite Use at an Ancient Maya Boomtown*

In this presentation, we discuss our research into the use of granite by the ancient inhabitants of Alabama: a Late to Terminal Classic boomtown of the eastern Maya lowlands. One of our initial hypotheses regarding the relatively sudden rise of the town toward the end of the Late Classic period focused on granite as a staple resource exploited by its residents. We highlight current results of local geological surveys and related spatial, geochemical, and petrographic studies; analyses of surface collected and excavated archaeological artifact assemblages and architectural elements; standardization observations; and attempts at community-engaged experimental archaeology. We then summarize the evidence in support of and against the staple resource hypothesis for settlement development. Although ancient Alabamans accessed granite in various ways and used it for multiple purposes—from the raw resource stage through to resulting manufacture byproducts—we conclude that insufficient evidence exists for proof of intensive staple product manufacture for export that would have fueled Alabama's socioeconomic development.

Philipp, Christopher [162] see Slovak, Nicole

Phillips, Amy [170] see Widga, Chris

Phillips, Bruce [179] see Fertelmes, Craig

Phillips, Keith [176] see Reid, David

**Phillips, Laura**

[143]

*Seeing Archaeology When You Can't See: A Pilot Project for Blind/Low-Vision Museum Visitors*

In October 2019, the Burke Museum of Natural History and Culture on the UW campus in Seattle reopened to the public in its new home, with an “inside-out” approach that invites audiences to visibly connect more deeply with the life of the museum. Galleries sit side-by-side with visible collection storage, labs, classrooms, and an artist studio. This literal focus on visibility has received stellar reviews but has its limitations with respect to visitors who are blind or have limited sight. To improve accessibility, the Burke Archaeology Department received a grant from 4Culture, and collaborated with Washington State Department of Services for the Blind summer youth program. This five-week pilot program brought together two paid blind/low-vision high schoolers, one undergraduate, and the archaeology staff to develop an accessible mini-program focused on the archaeology of Washington State.

**Picin, Andrea (Alma Mater Studiorum–Università di Bologna)**

[152]

*Chair*

**Picin, Andrea (Alma Mater Studiorum–Università di Bologna), Katarzyna Kerneder-Gubala (Polish Academy of Sciences), Damian Stefanski (Archaeological Museum in Kraków) and Sahra Talamo (Alma Mater Studiorum–Università di Bologna)**

[152]

*Weichselian Climatic Fluctuations and Neanderthals' Technical Behaviors in Central Europe*

During the Weichselian (MIS 5d–MIS 3), the climatic deteriorations and the rapid decrease of the temperatures caused significant difficulties for Neanderthal groups that had to cope with an increased seasonality of resources and faunal turnover. Central European Neanderthals reacted to these new ecological conditions by designing a toolkit composed of asymmetric bifacial knives, bifacial tools, foliate artifacts, and

coin-like scrapers (groszaks). This new cultural facies of the Late Middle Paleolithic is named Micoquian (or Central-Eastern European Micoquian; CEEM) spreading from eastern France to Poland, Northern Caucasus, and Altai. This paper presents new technological data from several Micoquian sites in southern Poland. Our results indicate high mobility patterns with fragmented operative chains and toolkits composed of flakes, scrapers, and bifacial knives. The 3D shapes of Micoquian asymmetric bifacial tools were also compared using geometric morphometric analysis. The results indicate some morphological differences between the assemblages, probably related to the different site's functions. Further comparisons with other Micoquian sites in Central Europe will reveal the Neanderthals' flexibility in land use during environmental changes.

Picin, Andrea [206] see Talamo, Sahra

**Pierce, Daniel (University of Central Florida)  
[126]**

*Ceramic Production in Postclassic West Mexico*

During the Early/middle postclassic period, the Aztatlán tradition grew to be the most influential culture in Western Mexico, creating expansive trade networks that extended far beyond the region. Though these trade networks are one of the most well-known aspects of the Aztatlán tradition, few studies have utilized archaeometric methods to assess trade and production of Aztatlán goods. Specifically, ceramics have rarely been analyzed beyond stylistic assessments. In this study, NAA was used to consider provenance of over 400 ceramic sherds collected from five different Postclassic West Mexican sites: Peñitas and San Felipe Aztatlán, located on the coastal plain; and Huistla, Santiaguito, and Atilán in the Jalisco highlands. Results suggest that there was little to no ceramic trade between the coastal plain and the highlands, a surprising result given the known trade relationship between the two regions. Further, we find little exchange of ceramics between individual sites on the coast as well. On the other hand, within the Etzatlán Basin, some overlap of compositional recipes exists between sites suggesting either common raw material usage or exchange. Overall, these results provide new and interesting insight into the Aztatlán trade networks, within which ceramics may not have been included.

Pierce, Daniel [216] see Goodwin, Whitney

Pierce, Daniel [10] see Navas-Méndez, Ana

**Piezonka, Henny (Christian Albrechts University Kiel, Germany)  
[79]**

*The Emergence of New Urban Nodes in Qing Period Mongolia (Seventeenth to Early Twentieth Century): Contrasting Roles and Histories of Monastic and Military Sites*

In Mongolia, the relation between sedentary urban and mobile herder lifeways has constituted a key socioeconomic and political factor for more than a millennium. This history is most prominently present in the Orkhon valley, preserving traces of various urban centers including the Medieval capital of Karakorum. Much less is known about the Qing dynasty period (1636–1911), when Mongolia had fallen under Manchurian dominance. In this era, most modern cities are rooted, but subsequent political developments have led to the abandonment or destruction of many of these urban sites. Within Gerda Henkel's "Lost Cities" program, a Mongolian-German project explores the emergence and perception of permanent settlement structures that evolved during this period, employing a multidisciplinary program of archaeological fieldwork, historical studies, and ethnographic work. Previously enigmatic pit formations in secluded valleys of the Khangai Mountains are now identified as garrisons connected to long-term military activities. Work at Baruun Khüree monastery, a formerly mobile Buddhist institution that became permanently sited in the seventeenth century, has revealed a wealth of new data on settlement layout, daily life activities, and the historical significance of this monastic node for the development of Mongolia's early urban network in the buffer zone between China and Russia.

**Pike, Jean (A/LRC | Architecture/Landscape Research CoLab)****[249]***Mesoamerican Precedents for Chaco Canyon Great House Architecture*

Architecture is one of the most common yet least understood of archaeological remains in the US Southwest. At Chaco Canyon, New Mexico, unique and monumental building forms emerged and proliferated during the ninth–twelfth centuries AD and questions still remain as to their origin. Lekson identified a formal typology for Chaco Canyon's great houses which in itself establishes that Chacoans built with intention as they reiterated specific plan types throughout a landscape—defined by its architecture—that spanned an estimated 30,000–60,000 square miles. The research presented in this paper builds on prior work and demonstrates that significant ceremonial centers in Mesoamerica likely served as models for Chacoan great house architecture, a process that continued into the Pueblo IV period. Pueblo Bonito and Chetro Ketl at Chaco Canyon, Aztec West at Aztec Ruins National Monument, and Pueblo Shé in the Galisteo Basin, NM, are specifically discussed. The research presented in this paper recapitulates the Ancestral Puebloan connection to Mesoamerica since specialized knowledge would have been required to plan and construct such large and complex structures in the US Southwest and since some correlation in function would have been required due to the similar spatial organizations that the structures defined.

Pike, Jean [137] see Leishman, Deborah

Pike, Matthew [219] see Cooper, H. Kory

Pilaar Birch, Suzanne [70] see Waite, McKenna

Pillsbury, Joanne [45] see Leachman, Robert

**Pimentel Nita, Roberto (University of Warsaw)****[139]***Potters of Castillo de Huarmey: Confluence, Production, and Innovation of Ceramics*

Multidisciplinary research and analyses of ceramics found in Castillo de Huarmey, a political center of the Wari Empire during the late Middle Horizon (AD 800–1000), conducted in the last 10 years have produced new interpretations. A large number of ceramic vessels were deposited as offerings in elaborate mausoleums to honor ancestors, who were once members of the Wari high society. The combination of ceramic forms and production techniques, as well as iconography, suggests an environment in which artisans trained in different technological and iconographic traditions to jointly produce vessels. This resulted in hybrid creations with characteristics of northern and southern ceramic traditions. The paper discusses the nature of pottery production in Castillo de Huarmey, which reveals new perspectives on the Wari presence in this part of the Peruvian coast.

Pine, Kylie [98] see Fitzgerald, Kimberli

Pinhasi, Ron [214] see Tejero, José-Miguel

**Pink, McClean (East Carolina University) and Megan Perry (East Carolina University)****[102]***A Comparative Analysis of Mortuary and Domestic Artifacts from Petra's North Ridge*

Interpreting the use of material culture in mortuary contexts provides an intimate view of social identity of

both the deceased and mourners in ancient societies. However, the material remains of mortuary practices throughout the Nabataean Kingdom in Jordan have not been systematically investigated. Comparing the material culture between contemporary mortuary and domestic contexts allows for the preliminary characterization of uniquely mortuary material culture, and highlights objects that have a dual purpose within both spaces. This study focuses on portable material culture from two second-century BC to first-century AD contexts within the capital city of Petra: at least three domestic complexes and five rock-cut shaft chamber tombs. Through this comparative analysis of the small finds, we found that coins, lamps, figurines, grinding stones, and items of personal ornamentation are found in both mortuary and domestic contexts. However, they differed in abundance or in the case of jewelry, material. Additionally, items including game pieces and coffin studs are specific to mortuary contexts, while specific household items like spoons are only found in domestic contexts. Therefore, this research provides insight into not only formation processes of these contexts, but also a glimpse into meanings of the material objects they contain.

Pinkman, Rachel [71] see Baxley, Aleta

**Pinta, Elie (Université Paris I Panthéon-Sorbonne / UMR 8096) and Claudia Baittinger (National Museum of Denmark)**

**[150]**

*Managing Wooden Resources in Norse Greenland: Using Tree Rings to Explore Wood Use and Acquisition Strategies in a “Treeless” Environment*

During medieval times, Norse Greenlanders relied heavily on wood for making household items, as a construction material, and as a fuel source. Although the quantity and quality of timber available in local woodlands were limited, Norse craftspeople also had access to driftwood and imported materials. Most studies in the North Atlantic use taxonomic analysis to trace the origin of archaeological wood remains. Using dendrology alongside this can provide us with additional information about wood diameter and growth conditions. This preliminary study uses stave-built vessel components in the first morphometric analysis of archaeological wood remains from Norse Greenland. Combining taxonomic identification with analysis of growth-ring width and curvature indicates that Norse woodworkers favored medium to large pieces of coniferous wood in making coopered vessels, most probably reflecting timber availability on local driftwood beaches. Wood of smaller diameters, typical of native Greenlandic taxa, was used to a lesser extent. Growth-ring widths suggest that most of the timber comes from areas where growth conditions are restricted, such as the boreal forests from which much Arctic driftwood originates. Despite limited wood sources, the study indicates that Norse Greenlanders successfully gathered raw materials locally for a wide range of activities.

Pinto, Samuel [191] see Díaz García, Mauricio

Pinto, Samuel [52] see McNeil, Cameron

**Piperno, Dolores (Smithsonian National Museum of Natural History)**

**[61]**

*Tom Dillehay’s Contributions to Agricultural Origins and Development*

Tom Dillehay’s best-known research is probably his pioneering work at Monte Verde, Chile, which was primary in upending the “Clovis First” paradigm for the initial peopling of the Americas. Perhaps less well known is his research in Peru that provided crucial information on the age, location, settlement patterns, and social contexts of some of South America’s earliest farmers. This paper will review this body of research that demonstrates the amazing breadth of his research career on precolumbian peoples.

Pique, Raquel [92] see Aguilera, Nelson

**Pitblado, Bonnie (University of Oklahoma)****[96]***Discussant***Pitblado, Bonnie (University of Oklahoma), Delaney Cooley (University of Oklahoma), Horvey Palacios (University of Oklahoma), Bobi Deere (University of Oklahoma) and Kaylyn Moore (University of Oklahoma)****[136]***Community-Engaged Scholarship and the Oklahoma Public Archaeology Network*

The Oklahoma Public Archaeology Network (OKPAN), founded in 2016, recently engaged in strategic planning that has helped streamline our programs and increase the breadth of our community engagement. In our paper, we highlight two initiatives that have proved particularly effective at empowering communities that have traditionally been excluded from archaeology. The first is a high school internship program conducted in partnership with a different historically disenfranchised Oklahoma community each summer. The internship is co-taught by an archaeologist and a community member with expertise in their community's heritage, and it culminates in student production of Oklahoma's annual "Archaeology Month" poster. The second program we discuss is an online heritage magazine called, for its first four years of publication, "OKPAN Quarterly," but recently renamed "The Community Archaeologist." The magazine is produced entirely by University of Oklahoma graduate and undergraduate students from departments across campus, and it features content written by members of many diverse Oklahoma communities. Both initiatives fulfill OKPAN's commitment to heritage and service by extending our collaborative networks into K-12 and digital spaces that engage more people in new, diverse, and reimagined ways.

**Plata Aguilera, Olganydia (Columbia University)****[122]***On Finance: Toward an Archaeology of Debt of Colonial New Mexico*

This poster presents the results of faunal, ceramic, and lithic analyses of the San Antonio del Embudo midden, a refuse site for a small Hispano agropastoral community in the northern borderlands of the Spanish Empire. These analyses are informed by both archived and new translations of the last will and testaments of the original proprietors of the San Antonio del Embudo land grant, the Martins. By interlocking analyses of archaeological and archival material, this poster ultimately aims to complicate current understandings of financial relations (particularly, debt relations) in the protocapitalist context of colonial New Mexico.

**Plekhov, Daniel (Portland State University), Linda Gosner (Texas Tech University) and Jessica Nowlin (University of Texas, San Antonio)****[95]***Remote Sensing Methods for Investigating Modern-Day Land-Use Intensity in Archaeological Landscapes: A Case Study from the Sinis Archaeological Project, Sardinia*

Many archaeological surveys are conducted in landscapes that are today being actively used for agricultural production. Farming practices, such as plowing, are in fact often essential for exposing and bringing to the surface formerly buried archaeological materials—the study of which allows archaeologists to develop regional-scale assessments of where human activities took place in the past. Despite careful survey and sampling protocols, such assessments nevertheless remain biased by field conditions at the time of survey. Numerous studies have investigated the effects of visibility, weather, and obtrusiveness on artifact recovery rates, yet few have considered the long-term effects of land-use intensity itself: how frequently fields are planted and cultivated over a multiyear period. Obtaining such information at regional scales has previously been extremely challenging but is now possible with the widescale availability of high temporal and spatial resolution satellite imagery. In this paper, we investigate trends in land-use intensity within the Sinis Peninsula of west-central Sardinia during the period 2018–2022. Using Sentinel-2 data and Google Earth Engine, we evaluate and quantify the intensity of land use across this landscape and consider what effects modern-day land-use practices may have on the frequency and composition of recovered archaeological materials.

Pleuger, Sarah [244] see Wright, Joshua

**Plew, Mark (Boise State University) and Louisa Dagers (University of Guyana)**

[218]

*Reconstructing Holocene Coastal Adaptations: An Evaluation of the Archaeological Shell Midden Record along Guyana's Northwestern Coast*

Guyana's shell midden complex, which stretches across its northwestern coast, documents more than 7,500 years of human land use. Traditional interpretations of the middens have assumed a degree of environmental constancy save for fluctuating Holocene sea levels associated with species found in marine and brackish waters. This study provides a temporal synthesis of the archaeological record of seven shell midden sites associated with sea-level rise between 7200 and 6000 BP and the emergence of mangrove swamps between 6000 and 4000 BP. Stable carbon  $\delta^{13}\text{C}$  and oxygen  $\delta^{18}\text{O}$  isotope compositions data are utilized to assess the degree of dietary stability of the early to middle Holocene. Though a stability in the presence of  $\text{C}_3$  plants appears common during the Holocene, analysis indicates increased warming in the early Holocene with periods of open canopy.  $\delta^{18}\text{O}$  isotope values compositions also suggest that isotopically similar drinking water sources existed at all sites. While a reliance upon shellfish species continues throughout the Holocene, mobility may have increased with expansion of areas of open canopy. Reassessment of the zooarchaeological record indicates a broadening of the diet breadth.

**Plimpton, Kate (DoD Cultural Resources Program)**

[209]

*Discussant*

**Ploetz, Chris, Amy Thompson (University of Texas, Austin), Richard Wood (University of Nebraska), Loa Traxler (University of New Mexico) and William Fash (Harvard University)**

[176]

*Digital Dig Kits: Portable Affordable Archaeology for Twenty-First-Century Fieldwork*

Recent advances in lidar technologies have been profound for archaeology, amplifying the subdiscipline of digital archaeology. However, lidar units, both aerial and terrestrial, have remained cost prohibitive until recent products by Apple including the iPad and iPhone Pro series. These products are among the first consumer electronic devices with built-in lidar sensors capable of collecting point cloud data. This poster examines the applicability of the iPhone lidar sensor in archaeology drawing on three case studies from the Classic Maya Lowlands. First, we compare the iPhone lidar with traditional methods of plan view drawings of archaeological excavation levels from Ix Kuku'il in southern Belize. Second, in Honduras, we compare the iPhone lidar captures of previously excavated tunnels in the Copan Acropolis with high-resolution 3D models developed from TopCon total station data. Third, we compare the iPhone and Faro Focus 3D, a terrestrial lidar unit, point clouds captured on an ancient Maya building façade at Copan comparing the quality, density, and noise of the two systems. While there are advantages and disadvantages to using iPhone lidar, the speed, accuracy, and simplicity outweigh the drawbacks, making it a useful tool that complements traditional field methods in any archaeologist's toolkit.

Ploetz, Chris [234] see Traxler, Loa

Plog, Stephen [48] see George, Richard

**Pluta, Paul (University of Florida), Brittany Cummings (University of Florida), Jessica Whelpley (University of Florida), Megan LeBlanc (University of Florida) and Gustav Paulay (University of Florida)**

[71]

*Toward a Holistic Understanding of Marine Ecosystems in the South Central Andes: An Interdisciplinary Marine Invertebrate Biodiversity/Zooarchaeological Survey*

Maritime adaptations play an essential role in the central Andean past as far back as the region's earliest occupation. While economically useful molluscan species are well known by archaeologists, other invertebrates are inadequately understood due to poor preservation and/or lack of interest. This poster presents the preliminary results of a biodiversity survey conducted in southern Peru by an interdisciplinary team of zoologists and archaeologists. Invertebrates were collected using intertidal and SCUBA methods, identified by taxonomic experts, imaged, sampled for DNA, and vouchered in the Florida Museum of Natural History. Resulting data has been compiled into a website designed to aid archaeologists in the identification of marine invertebrates by providing photographs, CT scans, and up-to-date taxonomic information all linked to a museum specimen. Additionally, the website provides data on animals that were likely consumed but lack remains commonly preserved in archaeological deposits (e.g., sea cucumbers and octopuses), and animals essential to the ecosystems but not directly consumed by humans (e.g., amphipods and polychaetes). By combining efforts to document marine biodiversity with archaeological research, this project broadens our understanding of the inhabitants of the prehistoric Andean coast beyond consumers of marine resources to participatory members of a rich and complex ecosystem.

**Podolinsky, Matthew**

[167]

*Discussant*

**Podolinsky, Matthew and Elizabeth Hora (Contributor)**

[155]

*Signage and Protection: The Effect of Moral and Threat Appeals at Reducing Depreciative Behaviors at Rock Art Sites*

Depreciative behaviors are unintentional actions by visitors that damage the resource or impact the experiences of others. Rock art in particular is highly susceptible to these types of behaviors and the damage may be permanent. As visitation to cultural sites, including rock art locations, increases, the opportunity for depreciative behavior likewise increases. While there is extensive research on moral- and threat-appeal messaging around natural resources, there has been surprisingly little research on these types of approaches around cultural resources. This study designed, installed, and assessed the effectiveness of a moral-appeal message using the Norm Activation Theory of Prosocial Behavior, the current Bureau of Land Management (BLM) threat-appeal message, and a no-message control at reducing depreciative behaviors at rock art sites. This research resulted in a significant decrease in depreciative behavior, specifically touching, when the moral-appeal message was installed. Surprisingly, this study found that the BLM threat-appeal message led to an increase in depreciative behaviors as compared to no-message control suggesting that current land management agencies should reevaluate their indirect management approach to protect remote rock art sites. This study strongly recommends replacing the current signs with moral-appeal messaging and investing in future research to preserve rock art.

Podolinsky, Matthew [167] see Hora, Elizabeth

**Poister, Nicholas (University of New Mexico), Steve Baumann (National Park Service), Andrew Van Cleve (Archaeology Southwest) and Richard Greene (National Park Service)**

[81]

*Patterns of Precontact Lava Tube Cave Use at El Malpais National Monument, New Mexico*

During the field seasons of 2020 and 2021, the Cultural Resources Branch at El Malpais National Monument undertook an inventory of archaeological sites located within some of the monument's more than 400 lava tube caves. While scores of caves containing cultural resources have been identified through an ongoing

mapping initiative, few had previously been systematically investigated or formally recorded. The project recognized recurrent themes in cave features and artifact assemblages associated with four behavioral categories: cave ice harvesting, pottery caching, faunal bone caching, and the construction of subterranean architecture. Aspects of each of these practices may have been utilitarian, ceremonial, or both. Further, these behavioral categories often intersect. For example, utilized ice caves also frequently harbor faunal caches, suggesting that these two practices were pragmatically or symbolically linked. While internal architecture is not usually found within ice caves, in some instances it does occur in a second, dry cave within a few hundred meters. This overlap points to the possibility that these various behaviors were facets of the same overarching program of cave use. Rare or isolated artifact occurrences, not conforming to the above categories, offer invaluable clues to symbolic practices once conducted in El Malpais caves.

**Politis, Gustavo (INCUAPA-CONICET, Argentina)**

[61]

*The Peopling of Southern Cone: A View from the Other Side of the Andes*

The discovery of Monte Verde 2 west of the Andes confirmed a pre-Clovis peopling of South America. Since then, other archaeological evidence in the eastern plains of the Southern Cone showed diverse adaptive patterns and varied technologies, different from Monte Verde, between 14,000 and 12,000 cal BP. In this presentation, the extant information from 15 sites in the Pampas region will be summarized, and the peopling of the Southern Cone will be discussed. Recent human paleogenomics data related to the mitochondrial clades D1g and D1j will also be integrated. The current data permits to outline two phases during the process of peopling this region. An early stage was represented at the Arroyo Seco 2 site in the grasslands, and a later phase testified at several sites, both in the grasslands and in the Tandilia Hills, many of them with Fishtail projectile points. Some sites also display other projectile point types (i.e., El Tigre). The current evidence suggests a heterogeneous cultural scenario in the Southern Cone during the Late Pleistocene times and a significant increase in population after 13,000 cal BP.

**Polk, Sara, Jeremy Wilson (Indiana University—Purdue University Indianapolis) and Broxton Bird (Indiana University—Purdue University Indianapolis)**

[45]

*Space, Time, and Climate in the North American Midcontinent: Settlement Patterns and Paleoclimatic Variability through the Mid- to Late Holocene*

High-resolution paleoclimatic data have been increasingly utilized in archaeological research to investigate regional settlement patterns, periods of growth, stasis, and decline, and episodes social stress and resilience, among other subjects. Until recently, few databases have existed for the Eastern Woodlands of North America that enable researchers to examine these linkages over broad swaths of space and time. In this poster, we examine the Digital Index for North American Archaeology (DINAA) for the distribution of archaeological sites and Kelly and colleagues' recently published radiocarbon dataset for the continental United States to investigate settlement patterns in the North American midcontinent during the mid- to late Holocene. We then compare these merged datasets with our 8,000-year-long paleoclimatic record from Martin Lake in LaGrange County, Indiana. The isotopic evidence for thermal stratification and precipitation sources from Martin Lake provides an understanding of hydroclimatic variability and warm-season duration from the Middle Archaic onward. In combining the radiocarbon, settlement, and isotopic datasets, we synthesize archaeological site distribution and climatic phenomena over time and contribute to the refinement of our current understanding of the temporal relationship between settlement patterns and paleoclimatic variability in the North American midcontinent.

**Pollack, David (Kentucky Archaeological Survey) and A. Gwynn Henderson (Kentucky Archaeological Survey)**

[19]

*Insights into Central Kentucky Adena Moundbuilding Drawn from Tom Dillehay's Research on Mapuche Moundbuilders of Southern Chile*

Upon arriving as a visiting professor at the University of Kentucky in 1980, Tom Dillehay took an immediate interest in the mounds and geometric earthworks that dotted the Bluegrass landscape of central Kentucky. As he drove the country roads and walked the rolling hills around Lexington, Dillehay immediately saw parallels with his archaeological, ethnographic, and ethnoarchaeological work among the Mapuche moundbuilders of southern Chile, despite the obvious differences in environment and regional cultural histories. Throughout his career, Dillehay's work has always sought to explore big ideas, patterns, and processes in the places he lives and works. The parallels he observed included: the possibility that the large, accretional Adena burial mounds served as boundary markers; the significance clay may have played in Adena mound construction; the removal of ritually charged Adena symbolic materials at the conclusion of rituals; and the maintenance of sacred places by later generations. These observations, his descriptions of Mapuche mound rituals performed at night, and the Mapuche's characterization of their mounds as standing in "mother-daughter" relationships has had a profound influence on how many Ohio Valley archaeologists interpret Adena sacred places.

Pollack, David [21] see Carlson, Justin

Pollack, David [19] see Henderson, A. Gwynn

**Pollard, Dominic (New York University)**

[64]

*Peaks Above, Plains Below: The Deeper Context of Settlement Patterning in Late Bronze Age and Early Iron Age Crete*

This paper presents an analysis of the long-term dynamics of settlement patterning on the Greek island of Crete, with a particular focus on the Late Bronze Age and Early Iron Age. Alongside—or in the absence of—other forms of archaeological data, changes in settlement patterning have been central to debates around political and economic change on the island across the period, which includes the collapse of the Bronze Age palaces, and the emergence of the early city states or poleis. This paper situates these changes within a deeper spatio-temporal context, considering the relationships between human settlement and the island's geology, topography, and ecology. Drawing on GIS datasets and methods, oscillations in these relationships are identified, which in turn can be related to significant historical developments during the period under investigation. It is argued that by first establishing a more foundational appreciation of the ecological and topographic correlates of settlement on the island in prehistory, we can better understand the specific historical conditions—and social strategies—which introduced short-term variation and idiosyncrasy into these long-term patterns.

**Pollard, Helen (Michigan State University)**

[13]

*Discussant*

Pollard, Kellie [14] see Smith, Claire

**Pompeani, Katherine (Defense POW/MIA Accounting Agency)**

[205]

*Chair*

**Pompeani, Katherine (Defense POW/MIA Accounting Agency)**

[205]

*Landscapes of the Dead: Using GIS to Model Social Relationships in a Large Bronze Age Cemetery*

Geographic Information System (GIS) technology is an important tool for examining social relationships in large horizontally stratified cemeteries. This study applies GIS-based cluster analysis to identify multiscale patterning at the Middle Bronze Age Maros cemetery at Ostojićevo, Serbia. Three successive scalar clusters

were identified: (1) primary clusters; (2) secondary clusters within primary clusters; and (3) peripheral burials. Graves to the south exhibited a linear distribution along a south-north axis whereas graves to the north followed a circular clustering pattern. The potential social significance of these statistically derived clusters was assessed using demographic (e.g., age-at-death, sex) and mortuary (e.g., treatment, offerings) data. While there is limited evidence of spatial patterning among mortuary variables, near analysis of mean grave distance shows differences among age-at-death and sex cohorts. Notably, subadults (<15 years-at-death) were buried significantly closer to both subadults and adult females. These observations tentatively support a pattern of close-kin clustering, specifically sibling groups or mother-child pairs. At the level of the cemetery, primary clusters likely reflect extended kin networks or lineages crosscut by social factors (e.g., gender, status).

Pomstra, Diederik [116] see Van Gijn, Annelou

**Ponce, Jocelyne (Tulane University), Marcello Canuto (Tulane University) and Tomas Barrientos (Universidad del Valle de Guatemala)**

[238]

*Looting Enigmas and Contextual Narratives at La Corona*

Over two dozen hieroglyphic panels looted in the 1960s from the site of La Corona, formerly known as “Site Q,” ended up in private collections around the globe. Some of these panels are featured in the Grolier Catalog. While the monuments have provided extensive information on the role of La Corona in the Lowland Maya sociopolitical landscape, we discuss how archaeological context entirely changes our understanding of Classic Maya political history. Extensive excavations in La Corona’s looted Structure 13R-10 have demonstrated what looted monuments could not: that most if not all these hieroglyphic monuments were repositioned by the ancient inhabitants. This information has allowed us to reconstruct a much more complete narrative from contextual evidence. Through this case study we discuss how epigraphic and material data complement each other for a holistic understanding of the excavated building and the sociopolitical history of La Corona more broadly.

Ponce, Jocelyne [131] see De León, Adriana

**Pool, Christopher (University of Kentucky)**

[80]

*Contextualizing the “Tuxtla” Statuette: Epi-Olmec Writing and Representation in Tres Zapotes, Veracruz, Mexico, and Its Hinterland*

The greenstone figure known as the Tuxtla Statuette is significant as one of 12 objects with an Epi-Olmec text, and the first to be described in the scholarly literature. For over a century it was misidentified as having been recovered from the Sierra de los Tuxtlas, near the town of San Andrés Tuxtla, Veracruz. The author of this paper participated in archival and oral history research initiated by John Justeson in 2010 that corrected this error, demonstrating that the statuette was found on the Hacienda Hueyapan de Mimendi in or very near the archaeological site of Tres Zapotes. Tres Zapotes is also the site that produced the cabeza colossal de Hueyapan and Stela C, the latter of which is famous for bearing another Epi-Olmec inscription and Long Count date. This paper reflects on John Justeson’s important contributions to Epi-Olmec epigraphy and extends the prior research on the Tuxtla Statuette in the light of archaeological investigations in Tres Zapotes and the surrounding region to place the object more precisely in its sociopolitical and historic context.

Pool, Christopher [216] see Meyer, Matthew

Pool, Christopher [140] see Newhall, Victoria

**Pope, Melody****[246]**

*Functional Riddles, Chipped Stone Technologies, and Fiber Processing in the Late Sixth and Fifth Millennium BCE in Turkmenistan and Northwestern Europe*

Use-wear and residue analysis draws attention to complexities of technological processes that otherwise remain out of reach archaeologically. Enigmatic wear traces described by microwear analysts as “polish 23,” “polish 10,” and “polish non familiar” occur on distinctive chipped stone tools from Late Mesolithic and Early Neolithic sites in northwestern Europe. Although the wear traces have not been fully replicated experimentally, their unique characteristics hint at processing fibers of plant and possibly animal origin. High-power microwear analysis of chipped stone tools from the Aeneolithic village (ca. 4650–4350 cal BCE) of Monjukli Depe in the Kopet Dag piedmont of southern Turkmenistan revealed similar wear traces to those documented in northwestern Europe. In this paper, I evaluate the use-wear evidence from Monjukli Depe in the context of current understandings of fiber processing technologies from the late sixth and fifth millennium BCE in northwestern Europe.

Porat, Naomi [241] see Rosen, Steven

**Porr, Martin (University of Western Australia)****[14]**

*Indigenous Archaeologies across the Global South: Confronting World-Building and World-Destroying Capacities and Realities*

In recent years, archaeological research and cultural heritage management have advanced considerably toward the integration of community-guided practices and processes. The dimensions of research ethics and social justice appear to play increasingly prominent roles in the design and conduct of archaeological and related projects. It has even been suggested that the current phase can be described in terms of an “ethical turn” in global archaeology. However, at the same time, a range of political, economic, and social factors appear to jeopardize these developments. Global research processes continue to be dominated by the United States and Western European countries. Cultural heritage management and heritage legislation continue to favor extractive industries at the expense of Indigenous cultural heritage preservation and continuation. They continue the historical, epistemological, and ontological legacies of European colonialism. In this presentation, we want to provide an honest conversation about these issues and how they play out in current attempts to develop theoretically informed and ethically aware archaeological practices in the context of Indigenous communities in the Global South. We want to consider the political economy and political ontology of research and cultural heritage management and a deep reflection of the basis of academic knowledge production and dissemination.

Porraz, Guillaume [214] see Val, Aurore

Porter, Benjamin [149] see Taylor, Samantha

Porter, Cecilia [173] see Walls, Matthew

Porter, Joshua [212] see Brooks, Alison

**Porter, Samantha (University of Minnesota)****[159]**

*Discussant*

**Porter, Samantha (University of Minnesota), Michelle Andrews (University of Minnesota), Gilbert Tostevin (University of Minnesota), Goran Pajovic (National Museum of Montenegro), Nikola Borovinic (Center for Conservation and Archaeology of Montenegro) and J. Anne Melton (University of Minnesota)**

**[240]**

*Photogrammetry, Excavation Surfaces, and Sediment Packages: Measuring Site Occupational Intensity at Crvena Stijena, Montenegro*

In order to understand changes in the way hominins have used a site through time, it is critical to understand temporal changes in artifact density (i.e., a quantitative measure of the number of artifacts relative to the amount of supporting sediment in a given stratigraphic unit). However, accurately measuring the volume of a sediment package can be very challenging. This paper presents our efforts to develop a protocol to quantify and contextualize artifact density measures within the Middle Paleolithic sequence at Crvena Stijena (Montenegro). We combine 100% flotation, total station proveniencing of larger artifacts, lab recovery of artifacts as small as 1 mm through wet screening, micromorphology, and notably the frequent and systematic documentation of the excavation in 3D using photogrammetry. These 3D “excavation surfaces” capture in high resolution the volume of the excavation at a given moment in time and can be used in novel ways. For example, we are able to more precisely account for the volume of large rocks and boulders (a significant component of rockshelters). This integrated 3D workflow saves time during excavation, provides a substantial amount of additional context to other excavation data, and allows for the calculation of more accurate artifact densities.

Porter, Samantha [240] see Pajovic, Goran

**Posselt Santoyo, Emmanuel**

**[91]**

*Los sitios arqueológicos de la Mixteca vistos como espacios caminables*

Los sitios arqueológicos han sido vistos comúnmente como un conjunto de elementos arquitectónicos, generando una visión estática del espacio. Sin embargo, en esta presentación los entenderé también como espacios caminables, es decir, sitios que eran transitados por personas en tiempos precoloniales. Durante los recorridos arqueológicos de superficie se registran los elementos arquitectónicos y naturales que conforman los asentamientos, esto nos da la oportunidad de caminarlos y pensar sobre el rol de estos elementos en relación con el tránsito. De esta manera, en esta plática busco mostrar de manera preliminar cómo entender el tránsito al interior de los sitios precoloniales de la Mixteca y verlos como espacios arquitectónicos y caminables.

**Pothier-Bouchard, Geneviève (Université Laval)**

**[87]**

*Discussant*

**Pothier-Bouchard, Geneviève (Université Laval), Julien Riel-Salvatore (Université de Montréal), Michael Buckley (University of Manchester) and Karine Taché (Université Laval)**

**[218]**

*A Comparative Archaeological Exploration of Question-Oriented Sampling Strategies to Integrate ZooMS into Zooarchaeological Methods*

ZooMS (Zooarchaeology by Mass Spectrometry) collagen fingerprinting is increasingly applied to prehistoric faunal collections—especially highly fragmented and/or altered ones—to tackle questions regarding diet, subsistence, and hunting strategies. When mass sampling archaeological bones (i.e., hundreds of bone fragments), ZooMS is a powerful tool to improve overall taxonomic identification of the indeterminate fraction of faunal assemblages. However, sampling many bone fragments at random entails certain risks regarding methodological biases and collagen preservation for such specialized and often costly analysis. Question-oriented sampling strategies can help refine specific dimensions of our reconstructions about past

subsistence behaviors. In addition, in collections showing poor collagen preservation, using a portable FTIR instrument can be an effective and cost-efficient in-field pre-screening method for ZooMS. We present here two case studies from different chronological, geographic, and taphonomic contexts (i.e., NE North American Woodland open-air site and NW Italian Paleolithic rockshelter site) to explore how to develop sampling strategies adapted to different research questions and archaeological contexts.

Potra, Adriana [8] see Samuelsen, John

**Potter, Ben (University of Alaska, Fairbanks), Carrin Halfman (University of Alaska, Fairbanks), Holly McKinney (University of Alaska, Fairbanks), Joshua Reuther (University of Alaska Museum of the North) and Bruce Finney (Idaho State University)**

[15]

*Freshwater and Anadromous Fishing in Ice Age Beringia*

While freshwater and anadromous fishing are critical economic resources for late prehistoric and modern Indigenous peoples in western North America, the origin and development of fishing is not well understood. Here we present results from investigations into all reported fish assemblages in central Alaska earlier than 7000 cal yr BP. We document early human use of freshwater and anadromous fish in secure archaeological contexts. We evaluate patterns of fish ubiquity and diversity with respect to both climatic factors and modern/ethnographic data to characterize fishing origins and harvesting methods and strategies.

Potter, Ben [15] see Holmes, Charles

Potter, Ben [15] see Kielhofer, Jennifer

**Potter, Bethany (University of Kansas)**

[88]

*Chair*

**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)**

[88]

*Leveraging DNA Capabilities for Lithic Analysis: Experimental Results and Best Practices*

This paper outlines the results of a multipart experiment in obtaining DNA deposited on lithics to address questions regarding localized resource use. Previous publications hypothesize that DNA molecules can be preserved in microcracks in lithics and suggest that questions regarding resource exploitation can be addressed with lithics. The goal of this project is to expand the analytical toolkit used to study lithics by incorporating methodologies designed for ancient DNA (aDNA). Using stone tools manufactured for this experiment, we simulated DNA deposition from hunting activities by cutting a sheep leg, then burying the tools for 12 months before cleanly excavating them. Following aDNA best practices, the tools were processed for DNA extraction using several variations of a previously published extraction protocol for lithics, to evaluate how best to maximize success while ensuring artifact security. We amplified fragments of the sheep mitochondrial genome 50, 69, 77, and 100 base pairs long using both published and in-house designed primers. Success was measured by the fraction of attempts yielding amplifiable target DNA. These amplicons were Sanger sequenced to confirm target species presence. Preliminary results show the successful amplification of target DNA from modern lithics, suggesting further potential for aDNA analysis of lithic artifacts.

Potter, Bethany [88] see Baka, Abby

**Potter, James (PaleoWest Archaeology), Grant Coffey (Crow Canyon Archaeological Center) and Mark Varien (Crow Canyon Archaeological Center)**

[90]

*Community Organization on the Edge of the Mesa Verde Region: Recent Investigations at Cowboy Wash Pueblo, Moqui Springs Pueblo, and Yucca House*

This paper examines the formation of three community centers on the piedmont of Ute Mountain: Yucca House, Moqui Springs Pueblo, and Cowboy Wash Pueblo. Two villages, Moqui Springs and Cowboy Wash, occupy the southernmost edge of central Mesa Verde region and Yucca House sits on the eastern Ute piedmont, also near the edge of the distribution of community centers in the central Mesa Verde region. The occupation of each village dates to the final decades of ancestral Pueblo occupation in the central Mesa Verde region and therefore inform on how communities on these borderlands were organized just prior to, and during, the depopulation of the region. These contemporaneous, late Pueblo III communities clearly organized themselves differently on the landscape, likely due to several social, environmental, and demographic factors, including the provenance of households, local environmental vagaries, the degree of social and economic isolation of a village, and the choices made regarding the types of communal architecture adopted and the rituals they facilitated. This research is the result of a successful long-term partnership among Crow Canyon, PaleoWest, the National Park Service, Colorado State Historic Fund, and the Ute Mountain Ute THPO that is focused on the preservation of these large sites.

Potter, James [201] see Clark, Tiffany

**Pouley, Cheryl (Confederated Tribes of the Grand Ronde Community of Oregon)**

[194]

*Discussant*

**Pouley, Cheryl (Confederated Tribes of the Grand Ronde Community of Oregon), Michael Lewis (Confederated Tribes of the Grand Ronde Community of Oregon), Christopher Bailey (Confederated Tribes of the Grand Ronde Community of Oregon), Briece Edwards (Confederated Tribes of the Grand Ronde Community of Oregon) and Greg Archuleta (Confederated Tribes of the Grand Ronde Community of Oregon)**

[72]

*Improving the D Average: Contextualizing Archaeological Assessments of Eligibility for the National Register of Historic Places*

In cultural resource management (CRM) reports, precontact sites are often listed as potentially eligible for the National Register of Historic Places (NRHP), only under Criterion D (data potential), while postcontact sites are routinely listed under all four criteria. As a result, sites representing relatively minor activities of European settler populations may be protected, while sites representing generations of indigenous lives may be less so. Such bias reflects a wider epistemological issue. Connecting sites to persons and events centered in the histories of dominant societies is a linear process of correlating documentary evidence and material culture. In contrast, linking sites associated with historically marginalized peoples and cultures to specific persons and events requires wider contextualization. We present a seven step process that provides a more complete context for all archaeological sites: (1) Identification, (2) Delineation, (3) Description, (4) Contextualization, (5) Interpretation, (6) Evaluation, and (7) Management. While research archaeologists routinely use this type of recursive approach, our schema standardizes the process for CRM practitioners with tighter schedules and limited budgets.

Pouley, Cheryl [62] see Edwards, Briece

**Pouley, John (Oregon State Historic Preservation Office)**

[143]

*Getting Involved: The Benefits of Archaeological Awareness through Public Outreach*

Archaeologists that engage in public outreach have the ability to fulfill several important objectives, both for

the general public and for themselves. The act of informing non-archaeologists what professionals do, and why, has the potential to decrease unlawful looting, provide a better sense of place, promote cultural awareness, and dispel misconceptions. For the archaeologist, it gives them better understanding of outside perspectives, and an opportunity to justify why archaeology is important. As examples, important objectives of archaeological awareness may involve deterring students from later non-malicious collection of artifacts they may encounter, or from the path of unlawful looting itself. It may also involve providing the public with a greater understanding of the deep history of their community, facilitating a desire to become better stewards. It can also dispel misconceptions by explaining what archaeologists actually do, how they do it, and why it is important. Archaeological awareness through public outreach gives archaeologists real-time practice justifying archaeology, while exposing them to different perspectives and feedback from the public. Engaging in archaeological awareness through public outreach also has the potential to give archaeologists a better understanding of broader contexts to expand their ability to message their areas of interest.

Pouncett, John [53] see Werens, Karolina

**Powell, Alexandra (Indiana University–Purdue University Indianapolis) and Jeremy Wilson (Indiana University–Purdue University Indianapolis)**

[104]

*Children of the Gilded Age: Juvenile Age Estimation and Fertility Approximation for the Bethel Cemetery*

Bioarchaeological analyses of the Bethel Cemetery have provided a unique opportunity to understand population dynamics in central Indiana during the nineteenth and early twentieth centuries. With over 40% of exhumed individuals classified as juveniles, the cemetery can be characterized as being derived from a once-living population with high fertility rates. However, making inferences about fertility and growth requires careful consideration of skeletal samples' inherent biases and potential methodological shortcomings. In particular, the methods selected to estimate age-at-death for juveniles can have significant impacts on subsequent proportional measures of fertility and childhood survivorship, resulting in disparate reconstructions of demographic patterns. Our study examines two widely utilized methods for estimating age-at-death via tooth crown and root development. We employ both methods and then compare how each affects the proportional measures used by archaeologists to estimate fertility and childhood survivorship. The dental age estimation methods resulted in two significantly different survivorship curves and had a variable impact on the proportional measures of fertility. Our results indicate that researchers need to be cognizant of the structure of their skeletal sample, make informed decisions regarding age estimation techniques, and consider the applicability of differing fertility estimation techniques when attempting to reconstruct past population dynamics.

Powell, Wayne [166] see Stephens, Jay

**Powis, Terry (Kennesaw State University)**

[183]

*Chair*

**Powis, Terry (Kennesaw State University), Tristen Griffin (Kennesaw State University), Riley James (Kennesaw State University), Devlin McElrone (Kennesaw State University) and John Tomko (Kennesaw State University)**

[183]

*Excavation of a Burned Middle Mississippian House at the Cummings Site, Bartow County, Georgia*

Recent investigations by Kennesaw State University Field Schools completely excavated a thirteenth-century residential structure at the Cummings site, a small community 2 km downriver from the Etowah site. Dating to the Early Wilbanks phase (AD 1250–1325), that newly established community was part of the return of

people to Etowah and the site's ascent to regional prominence. The only other completely excavated Early Wilbanks phase residential building was located adjacent to Etowah's Mound B and dug by A. R. Kelly in the 1950s. The Cummings site structure presents a view of residential life on Etowah's periphery during its rise to power.

Powis, Terry [249] see Case, Joey  
Powis, Terry [115] see King, Adam

Praet, Estelle [155] see Manhas-Tamoria, Raveena

Prall, David [44] see Whitehead, William

**Prascik, Bethanny (West Virginia University), Bryan Hill II (West Virginia University) and Olivia Jones (West Virginia University)**  
**[44]**

*"Fresh" from the Field: Utilizing Legacy Collections for Undergraduate Research and Training*

Although legacy collections are rarely discussed explicitly in research and are often portrayed as subpar due to the lack of publication or the outdated excavation methods, we argue that legacy data is an important resource in archaeology. Legacy collections provide unique datasets that are both easily accessible and readily available. The Archaeology Lab at West Virginia University utilizes legacy collections in order to train students in artifact processing, analysis, and research. Our aim is twofold: to contextualize and disseminate archaeological data from legacy collections via publication and presentation and to promote such collections as useful tools for undergraduate research. In this poster, we present research projects with legacy collections from three sites—Oak Mound (46HS2), Blennerhassett (46WD1), and Brosius (46MN2)—to highlight how legacy data can provide new archaeological data after processing and research by undergraduates. As of spring 2022, we have trained 16 students, and three students have completed funded research projects using legacy data on loan from our partner institution, the West Virginia Archaeological Research and Collections Management Facility. This partnership has provided students the opportunity to gain knowledge and experience with archaeological data, and inspired them to continue working with legacy collections in future research endeavors.

**Prasciunas, Mary (Pima Community College), Helen O'Brien (Pima Community College) and Tineke Van Zandt (Pima Community College)**  
**[181]**

*The Critical Role of Community College Field Training Programs in Today's Archaeology*

The CRM industry is struggling to meet labor needs as funding from recent federal legislation increases the demand for CRM archaeology. The labor shortage is being felt at all hiring levels, from Field Technicians to Principal Investigators. The high cost of archaeological field schools and higher education in general are increasingly prohibitive for students, especially those from underrepresented groups. The resulting financial burden and low entry-level wages decrease the perceived value of archaeological field training, leading interested students to forgo the discipline in favor of more lucrative career pathways. The lack of trained field technicians worsens the labor shortage and threatens the sustainability of the CRM model. In this context, open-access field training programs that provide alternatives to high-cost field schools are more important than ever to the CRM industry and the archaeological discipline as a whole. This poster highlights the approach and relevance of Pima Community College's Archaeology Field Certificate Program. The Program provides an entry point for underrepresented students who might not otherwise pursue a career in archaeology; ensures that students receive industry-standard training through regular consultation with an Advisory Committee; and assists community partners by providing a pipeline of talent to fill the needs of local industry.

Pratt, Greg [102] see Hansen, David

**Pratt, Jordan (Texas A&M University)**

[21]

*Stemmed Points and Pluvial Lakes: Assessing the Manufacture and Distribution of Western Stemmed Points in the Harney Basin, Oregon*

The age and distribution of stemmed point technology in the Far West is important for a full understanding of late Pleistocene and Early Holocene archaeology in North America, especially for those interested in the initial settlement of the Americas. Despite the importance of stemmed points to debates surrounding the peopling process, there are still questions surrounding typology and distribution of specific stemmed point types. The research presented here provides a systematic metric and non-metric analysis of stemmed points collected, or recorded, on land managed by the Burns District Bureau of Land Management (BLM) in the Harney Basin, eastern Oregon. Robust ongoing research programs have focused on late Pleistocene and early Holocene archaeology in the Harney Basin, and over 500 stemmed points have been identified and collected from lands managed by the BLM. Here I present the analysis of those stemmed points in an effort to determine if there are discrete or continuous morphological and technological differences between defined Western Stemmed subtypes. Geochemical and geospatial data will also be incorporated in order to determine how raw-material variability and distance from geologic source potentially affects this variation. Together, these analyses will bolster our interpretations of Western Stemmed lithic technological organization.

**Pratt, Lauren (University of Michigan)**

[36]

*Chair*

**Pratt, Lauren (University of Michigan)**

[36]

*Human-Environment Interactions and the Hunter-Gatherers of Chachapoyas, Peru*

Although a growing bodies of scholarship address later cultural developments in such regions, Tropical Montane Cloud Forests (TMCF) are nevertheless perceived by many as environments marginal for human occupation, especially for hunter-gatherers. One such region, the Chachapoyas culture area in northern Peru, has to date been home to only a single known hunter-gatherer site. Here, I present the results of excavations identifying three additional preceramic sites across two ecological niches, and describe multiple lines of evidence—including lithic, faunal, botanical, and paleoecological analyses—which demonstrate how these early groups adapted their cultural and subsistence patterns to different microclimates within the TMCF zone. The archaeological record of hunter-gatherers in Chachapoyas is not, as previously believed, scarce or elusive; on the contrary, this work reveals a deep and rich history of early human occupation.

Pratt, Stephanie [241] see Vendome-Gardner, Charlotte

**Pratt, Will (University of Texas, Austin)**

[54]

*Chair*

**Pratt, Will (University of Texas, Austin), David Brown (Texas Archaeological Research Laboratory), Steve Athens (International Archaeological Research Institute) and Ryan Hechler (Tulane University)**

[54]

*A Thousand Years of Wetland Management at Hacienda Zuleta in the Ecuadorian Andes*

Nestled within a deeply incised valley in the eastern cordillera of the Andes, the archaeological site of Zuleta

is an immensely humanized hydrologic landscape. A complex network of perennially and seasonally wet streams and canals crisscross the pastures along the valley floor carrying water from the paramo to the Rio Tahuando. But a thousand years ago this landscape was vastly different than it is today. Buried raised field agricultural features and an extensive peat layer hint at a time before the arrival of the Spanish when the valley was much marshier and wetland agriculture was a viable subsistence strategy. The current paradigm maintains that raised field agriculture in the Ecuadorian highlands was abandoned after the AD 1280 eruption of Quilotoa volcano. But historic documents and archaeological evidence suggest that the real story is much more nuanced and regionally varied. A shift in climate and the Spanish effort to drain wetlands in the following centuries may have made wetland agriculture obsolete or untenable. This paper details our efforts to explore the disappearance of wetland agriculture using a multiproxy paleoenvironmental reconstruction approach including geochemistry, pollen, phytoliths, eDNA, and stable carbon isotopes to compare raised fields at Zuleta before and after the eruption.

Pratt, Will [36] see Hechler, Ryan

Prebble, Matiu [207] see Cochrane, Ethan

Preece, Katie [56] see Sherriff, Jenni

**Prentiss, Anna (University of Montana), Ashley Hampton (University of Montana), Thomas Foor (University of Montana) and Matthew Walsh (National Museum of Denmark)**  
[184]

*Fine-Grained Estimation of House Populations in North America's Pacific Northwest: Implications for Understanding Socio-demographic Change*

Archaeologists benefit from theoretical modeling in demographic ecology. Models generated by Bruce Winterhalder, Cedric Puleston, and colleagues provide us with precise predictions as to conditions favoring population growth, stability, decline, and associated socioeconomic implications. Our challenge as archaeologists comes with devising adequate tests using archaeological data. In this paper we explore relationships between measures of population, subsistence, and social relationships drawing data from the fine-grained record of Housepit 54 at the Bridge River site in British Columbia. Results offer a number of potential implications. First, methodological procedure (and associated assumptions) used to assess population affects variation in outcomes. Second, fine-grained estimations are critical for adequately assessing deductions from theoretical models. Finally, demography remains essential for understanding past decision-making regarding subsistence, mobility, and sociality.

Prentiss, Anna [170] see Ryan, Ethan

**Prestes Carneiro, Gabriela (Federal University of Western Pará [UFOPA]), Roberta Sá Leitão-Barboza (Federal University of Western Pará [UFOPA]), Myrian Sá Leitão-Barboza (Federal University of Western Pará [UFOPA]) and Claide de Paula Moraes (Federal University of Western Pará [UFOPA])**  
[235]

*Waterscapes Domestication: Ponds, Fish Weirs, and Evidence of Managed Aquatic Environments in Amazonia*

Animal management and domestication have been widely studied in relation to terrestrial mammals; however, there are still debates over what “domestication” means for aquatic animals. Across the Amazon, in recent years, a great number of archaeological structures such as fish weirs, canals, ponds, and turtle and fish corrals have been documented, dating back to at least AD 300. For example, fish weirs have been discovered in different regions of the Bolivian Amazon in the Llanos de Mojos and more than a hundred ponds have been recorded on the Belterra Plateau in the Lower Amazon. The function of these ponds seems to be linked to

water dynamics as during the wet season they can fill and retain water. However, Amazonian pond function is not always clear. In Central Amazonia, where post molds were found, it is possible that they served as corrals for turtles. The durations of animal “captivity” and the periods over which ponds could store fish are likely to vary greatly. We propose the concept of “waterscape domestication” as a way to understand how humans and animals have interacted throughout history in varied aquatic environments in Amazonia and to understand aquatic environments as places of domestication scenarios.

**Price, Seth (University of Arkansas) and Carlos Zapata Benites (Licenciado en Arqueología de Peru)**

**[164]**

*Soil Conservation Past and Present: A Study of Archaeological Raised Fields in North Coastal Peru*

The Casma Valley, on the central-northern coast of Peru, is home to a relatively unique system of raised agricultural fields. Relicts of prehispanic culture, these fields are unusually well preserved. The most significant research on these fields was completed by Jerry Moore, along with excavations of the nearby site of Quebrada Santa Christina. Now, new investigations of the Casma Valley raised fields in 2021 revealed distinct patterns of soil alteration and landscape modification by past humans. The goal of this research is to assess why Late Chimú (AD 1300–1470) societies in the Casma Valley converted 200 ha of land into raised agricultural field systems, understand the cultural processes that were key to field operation, and determine how this information can contribute to modern sustainable development. Diverse data on soil composition is used to isolate soil conditions that represent ancient human activity from modern processes. This past-to-present spectrum is explored to look at modern anthropogenic soils and the long-term repercussions of cultivation. Multisensor geophysical methods are integrated here to examine these agricultural systems from multiple scales, and a new methodology for low-cost thermal photogrammetry is used to assess soil temperature and field drainage system operation.

**Priest, Brooke, Anna Coppola, Magen Hodapp and Chrissina Burke**

**[71]**

*Kind of a Pig Deal: The Taphonomic Effects of Chemically Enhanced Fertilizer on Adult Pig Bones*

Pig bones have historically been used as a proxy for human skeletal remains because of the similarities in cell structure and soft tissue texture. Using pig elements, and continuing the work of previously completed research on the taphonomic effects of fertilizer on faunal bone conducted by the Northern Arizona University Faunal Analysis Laboratory (NAUDAFAL), this research project seeks to establish the effects of fertilizer on pig for comparison to human bones. Burying the bones in a combination of fertilizer and soil, therefore recreating an underground, buried environment, we observed the taphonomic processes impacting cut, fleshed, and defleshed long bones and ribs over several months. Each experimental treatment had fertilizers of different nitrogen-phosphorus-potassium (NPK) ratios to understand how various chemicals alter bone mass and physical characteristics. We conclude that increased chemical compounds within fertilizers raises the acidity and pH levels and degrades the bone mass over several months. Additionally, the defleshed bone surface was impacted and the muscle of the fleshed bones decomposed slightly. While limited in duration and not necessarily statistically significant, this research demonstrates the value of evaluating fertilizer impacts in forensic and taphonomic contexts.

Priest, Brooke [122] see Coppola, Anna

**Prieto, Gabriel (University of Florida)**

**[59]**

*Preliminary Results of an Integrated Approach for the Study of Ceramic Vessels of Fishing Communities in Prehispanic Huanchaco, North Coast of Peru*

The archaeology of Peru has been dominated by the study of ceramics through the lenses of culture-history approach, which emphasize form, decoration, and style. These variables were successfully applied to identify

archaeological cultures and chronological periods. Subsequently, this approach helped to organize the configuration of the prehispanic territory and its sociocultural development. In this paper, I present a multidisciplinary study on complete and incomplete ceramic vessels found on various residential settlements of the Huanchaco coast, covering a chronological sequence between 1500 BC and cal AD 850. I use a classic morphological and decoration analysis, followed by technological, petrographic, and preliminary XRF studies. These studies are complemented with residue analysis (microbotanical remains). This approach raises questions on context, how the vessels were used, and what kind of food could have been prepared and eaten. The second set of questions is oriented toward understanding the production sphere, its provenience, and the intrinsic ideological factors embedded in ceramic vessels. Finally, using absolute dating from the contemporary archaeological context, I compare form and style to evaluate whether it is valid or not the correlation of the traditional cultural history approach for the construction of relative chronologies.

Prieto, Gabriel [3] see Gagnon, Celeste  
 Prieto, Gabriel [134] see Schaefer, Benjamin  
 Prieto, Gabriel [227] see Sutter, Richard  
 Prieto, Gabriel [160] see Verano, John  
 Prieto, Gabriel [134] see Torres Morales, Genesis  
 Prieto, Gabriel [134] see Witt, Rachel

**Primeau, Kristy (NYS ORES)**

[156]

*Discussant*

**Primeau, Kristy (NYS ORES)**

[50]

*Landscape as Performance Space: Interaudibility within Chaco Canyon*

Like visibility, audibility can be an actively managed aspect of the built environment, and one can question the relationship between site and sound in the landscape. As approached via the combined frameworks of phenomenology, performance theory, and political theater, interaudibility between sites would have served to create, manipulate, and reinforce power relations within the Chacoan community and afford experiences contributing to individual negotiations of identities and meaning. Using the Archaeoacoustics Toolbox for GIS, estimated soundsheds were created for 33 locations within Downtown Chaco dating to the tenth and eleventh century CE. Sound Pressure Levels were then evaluated to understand how events at shrines, stone circles, isolated kivas, and great houses may have been heard and experienced at other locations.

**Prince, Paul (MacEwan University) and Jesse Heintz (University of Alberta)**

[183]

*Refuse Disposal and Activity Area Patterns in a Fur Trade Period Pithouse on the Nechako Plateau, British Columbia*

Excavations in a nineteenth-century housepit revealed a simple stratigraphy allowing distinctions to be made between the artifact assemblages of the roof-fill and those of the house interior. It was found that lithic debitage was most common in interior living spaces, and seemingly still usable trade goods occur in the roof zone. These results are contrary to some conventional expectations about the curation of exotic goods and routine storage, activity, and disposal patterns in pithouses—particularly as regards the use of the roof for lithic reduction and messy processing activities. Some implications for understanding attitudes toward different materials, including what may be regarded as trash, how pithouses may have been experienced as actively lived in spaces, especially in winter; and how house maintenance and abandonment processes may contribute to roof zone assemblages are discussed.

**Priola, Victoria (University of Iowa) and António Valera (ERA Arqueologia)****[161]***Understanding Site Function and Textile Production in Southwestern Iberia (3400–2000 BCE): The Loom Weights from Perdigões (Alentejo, Portugal)*

The 16 ha site of Perdigões is comprised of ditched enclosures and negative features that were opened and closed throughout its long and complex occupation beginning in the Late Neolithic, continuing throughout the Chalcolithic, and into the early Bronze Age. This site includes around 12 roughly concentric circular ditches and several hundred circular pits, with a lower area in the center described as a natural amphitheater. Thousands of loom weight fragments were found throughout this center area, known as Sector Q. Loom weights are ceramic objects used in textile production and are a common find at settlements during the Chalcolithic in southwestern Iberia. Unlike contemporary fortified hilltop settlements in the region, there is currently little evidence for residential areas at Perdigões. Despite this, the loom weights at Perdigões appear similar to those at settlements. These loom weights provide the opportunity to explore the activities taking place at this notable site and its relationship to other settlements in the region. This paper presents the results of a preliminary analysis of this loom weight collection, examining the variability in these tools and their complex contexts, with the intention of better understanding textile production practices at this site and across the region.

**Pro, Sire and Tom Tandberg (Paleowest)****[6]***Comparisons and Connections between Nineteenth- and Twentieth-Century Glass Bead Assemblages in Paugvik, AK, and Beatty Curve, OR*

This paper considers two collections of glass beads excavated from residential contexts in Paugvik, Alaska (nineteenth century CE) and Beatty Curve, Oregon (nineteenth–twentieth centuries CE), and housed in the University of Oregon's Museum of Natural and Cultural History. Using LA-ICP-MS analysis, around 30 beads from each site were analyzed to determine the glass recipes and potential regions from which they were manufactured. Similarities in the compositions of beads from these sites have allowed us to consider possible trade connections and interactions between these communities. The locations of the assemblages within the sites themselves, particularly in Paugvik, can also contribute to determining when certain structures within the site were used and activities within the structures. In addition to compositional analysis, we will also discuss the glass bead typology from the entire assemblages and note similarities between Paugvik and Beatty Curve. Our results highlight trade connections, likely facilitated by Europeans, and that these trading relationships had an influence on the structure and management of these sites themselves. We will discuss further the importance of these conclusions.

**Pruette, India (University of Michigan)****[28]***An Experimental Archaeological Approach to Persian Period Mortaria Construction through the Lens of Tell el-Hesi*

Mortaria are vessels associated with kitchen pottery, particularly in the Persian period (approx. 550–330 BCE), and are often overlooked for flashier finds. In the 1970s, during excavations of Israeli site Tell el-Hesi, questions regarding vessel construction arose about recovered fragments of mortaria: namely that they were not wheel-made. At Hesi in 1973, potter Richard Fineman created a mortarium nearly identical to those recovered, using a rolled slab method. Later, in the early 1980s, Bill Glanzman examined the Hesi mortaria with X-ray of a flat piece as well as a cross-section. Both of these studies were in concurrence with the theory that these mortaria were not wheel-made. Since Glanzman's research, little more has been done to understand the process of creating this vessel so popular in the Persian period kitchen. For this poster, I employ experimental archaeology and recreate my own mortaria using Fineman's proposed method of construction and composition. Then, drawing on Glanzman's method of study, I examine my own sherds and compare my images with his. Through this re-creation and comparison, I will evaluate the hypothesis that Persian period mortaria were not wheel-made and shed light on a topic often overlooked in modern archaeology.

**Prufer, Keith (University of New Mexico), Megan Walsh (Central Washington University), Nadia Neff (University of New Mexico), Amy Thompson (University of Texas, Austin) and Douglas Kennett (University of California, Santa Barbara)**

[17]

*Wetland Maize Farming by 6000 BP Gave Way to Upland Farming with the Rise of Ancient Maya Settlements and Political Centers*

Recent research in the American neotropics suggests that cultivation of plants for food began early in the Middle Holocene (ca. 7500 BP) and continued for millennia prior to the adoption of surplus agricultural production of domesticated staple foods by 5000 BP in South America and 4000 BP in the Maya lowlands. Data reflecting early plant cultivation in the Maya lowlands are patchy, lacking information on shifts in farming strategies leading to intensification. Limited data from sites in southern Mexico and northern Belize suggest that by 6000 BP maize and other crops were being cultivated. We present multiproxy isotopic, microbotanical, and paleoecological evidence from wetlands in southern Belize indicating production of C<sub>4</sub> plants (likely maize) by 6000 BP. Our data suggest a cessation of wetland farming after 2200 BP, corresponding with a shift to upland cultivation evidenced at the nearby Classic period site Uxbenká. This shift is contemporaneous with the initial construction of settlements with stone architecture on a landscape where swidden and mulch farming of upland hillslopes has persisted for 2.5 millennia and is still practiced today.

Prufer, Keith [43] see Haffner, Jacob

Prufer, Keith [252] see Neff, Nadia

Prufer, Keith [163] see Palacios, Horvey

**Pryor, John (CSU-Fresno) and Michael Youngblood (Haslett Basin Mono)**

[124]

*California Tribal Unilateral Apprenticeship Program (CTUAP)*

The California Tribal Unilateral Apprenticeship Program (CTUAP) sets out to solve two fundamental problems: (1) Chronic unemployment and lack of job opportunities in Indian Country for tribal youth and (2) demand for diverse well trained archaeological technicians in the field of cultural resource management. CTUAP is an officially accredited California State apprenticeship program and is the first of its kind nationally. Over the last three years, CTUAP has developed two apprenticeships—Environmental Science and Protection Technician (ESPT) and Cultural and Conservation Technician (CCT). The apprenticeship motto is “Earn While You Learn,” thus the training is provided at no cost to the applicant. The CCT training combines course work provided by the State Center Community College District (SCCCD) in Fresno County and hands on training by Federally and non-Federally recognized Tribes, a 501(c)(3) organization, and participating CRM firms. In addition, by providing courses that earn college credit and field experience, the program is a postsecondary pathway that allows students to obtain their associate’s degree and above. While this program was designed with Native Americans in mind, it is not exclusive to only this ethnicity; it is open to all individuals.

**Przadka-Giersz, Patrycja (University of Warsaw)**

[139]

*Chair*

**Przadka-Giersz, Patrycja (University of Warsaw)**

[139]

*Elite Craft Specialists and Artists at Castillo de Huarmey*

There is increasing archaeological evidence that in the Wari Empire prestigious objects were fashioned by artists belonging to the elite. The archaeological excavations at the royal necropolis of Castillo de Huarmey provide important insights into the craft production of luxury goods during the Middle Horizon period. The discovery of the first undisturbed burial context of 58 noblewomen, along with all grave goods, confirms that

one of the activities of the ancient female elites was fine textile production. The newly discovered mortuary gallery of elite craftsmen confirms that both noblemen and noblewomen buried at Castillo de Huarmey were skilled craft specialists and artists of different kinds.

**Puente, Nicholas (University of Colorado, Boulder) and Sarah Kurnick (University of Colorado, Boulder)**

[242]

*Bundled Time: An Analysis of an Intrasite Sac-Be Assemblage at Punta Laguna, Yucatan, Mexico*

After Mexico declared its independence from Spain in 1821, foreign explorers began traveling throughout the Maya area and documenting sites, structures, and monuments then unknown in the United States and Europe. In photographs, drawings, and written reports, these explorers depicted Maya ruins as deserted and lifeless, and suggested that the passage of time had rendered them mute and ineffective. This presentation challenges such a Western, Romantic understanding of Maya ruins. It argues instead that these ruins are effective, consequential, and shape human actions, and that the passage of time often increases, rather than decreases, their potency. Roads offer a particularly useful case study: They both connect and divide people and things, simultaneously generating and dismantling sociomaterial entanglements. Specifically, this presentation considers an intrasite sac-be, or white road, at Punta Laguna, Yucatan, Mexico. Rather than focusing on spatial connections and divisions, however, this presentation considers temporal ones. How has this road—originally built during the Late Preclassic period (300/350 CE–550/600 CE) and continuing to exist in the present—interacted over time with a larger assemblage of human, material, climatic, and other actors?

**Pugh, Timothy (Queens College and The Graduate Center)**

[84]

*Chair*

**Pugh, Timothy (Queens College and The Graduate Center)**

[84]

*Middle Preclassic Settlements in the Petén Lakes Region of Guatemala*

Proyecto Itza has recently resurveyed a large area to the south of Lake Petén Itzá in Petén, Guatemala, extending from Lake Salpeten to Laguna Perdida. The work utilized a variety of methods including total station mapping, photogrammetry, and lidar (conducted by the National Center for Airborne Laser Mapping). The goal of the research is to discern the development of settlement hierarchies during the Middle Preclassic period and to find evidence of human settlement missed by earlier surveys. The surveys obviously encountered developments from other time period. The new data will serve as a foundation for future work in Petén by Proyecto Itza and other projects.

**Pugliese, Francisco (University of Florida), Thiago Kater (MAE/USP BRAZIL), Marcony Alves (MAE/USP BRAZIL), Kelly Brandão (MAE/USP BRAZIL) and Eduardo Neves (MAE/USP BRAZIL)**

[59]

*The Origin of the Amazonian Ceramic Diversity Seen from the Monte Castelo Shell Mound*

In this presentation we will bring the latest archaeological data from the Monte Castelo shell mound, one of the most important ceramic sites of the Amazon. Some of the oldest ceramics of the continent are found there and in this symposium the characteristics about the emergence of Bacabal phase and the new data about the local development of the first pottery of the southwestern Amazon, the Sinimbu ceramics, will be discussed. Technological and archaeometric analysis will be articulated with the deep Indigenous history in order to generate a multidisciplinary scenario about the social contexts of the emergence and diffusion of the ceramic technology in the South American lowlands.

Pugliese, Francisco [86] see Villagran, Ximena

**Pullen, Daniel (Florida State University)****[10]***Taking the Palace out of Palatial Control*

Hierarchical models of political and economic organization still pervade the scholarship of complex societies in the Bronze Age Mediterranean. This is especially the case for those societies such as Late Bronze Age Greece identified as “palatial” in which the palace and its officials are accorded near complete control over the economy. There is much growing evidence for and reinterpretation of the roles of actors partially or fully outside the purview of the palatial centers. Using the test case of the establishment of the walled port town of Kalamianos on the Saronic Gulf of the Aegean, which has been considered a colonial enterprise, I evaluate the roles of the palatial center of Mycenae, agents acting under palatial control, and agents who functioned outside palatial control in the construction and organization of the new settlement. I conclude that while palatial officials may have contributed capital and labor to the initial founding and construction, the settlement and its rural infrastructure were intended to be self-sufficient and function independently of palatial control. Thus instead of a palatial “colony,” Kalamianos should be considered as a community of actors engaged in their own economic interests independent of the palace.

**Punke, Michele (Historical Research Associates)****[107]***Discussant***Punzo Díaz, José Luis (Instituto Nacional de Antropología e Historia)****[200]***Chair***Punzo Díaz, José Luis (Instituto Nacional de Antropología e Historia), Carmen Ramos Osnaya (INAH-Michoacán) and Fernanda Navarro Sandoval (INAH-Michoacán)****[200]***Lidar, Architecture, and Petroglyphs: Urban Analysis of the Vapatzequa San Pablo, Tzintzuntzan*

In this poster we will present the data derived from systematic surface prospections within one of these vapatzaquas, the neighborhood of San Pablo, Tzintzuntzan, which is one of the most important in the city, since inside it is located the Great Platform with the five yácatas, as well as another of the largest platforms of the city, which still preserves evidence of unexplored mounds, as well as a large number of terraces identified by remote sensing. Thus, these prospections, guided by the recognition of architectural elements within lidar models, have allowed us to know better the urbanism of the city, because it has not only allowed us to make field verifications but also to link together the different elements, like petroglyphs, that formed the urbanism of Tzintzuntzan.

Punzo Díaz, José Luis [200] see Gastelum-Strozzi, Alfonso

Punzo Díaz, José Luis [200] see Ibarra López, Miguel

Punzo-Díaz, José Luis [200] see Rodríguez-Rodríguez, Karla

Punzo Díaz, José Luis [163] see Snow, Meradeth

**Purcell, Gabrielle (Troy University)****[190]***An Analysis of Cherokee Foodways during European Colonization*

Cherokees, like other Native American groups, experienced significant disruptions in their lifeways as a result of European colonization. However, there is also evidence that Cherokees adjusted to these changes and continued to live in relative stability. For example, historic accounts from Europeans indicate that Cherokees underwent a period of what they described as “prosperity” in the late eighteenth century, during which Cherokees grew large amounts of maize and adopted a new staple crop, the sweet potato. I use the

macrobotanical remains from several archaeological sites occupied before and during European colonization to clarify how Cherokees experienced colonization. I compare sites in the Appalachian highlands region occupied from the Mississippian period (circa AD 1000–1540) through the early-nineteenth century (AD 1540–circa 1830) to examine changes and continuity in subsistence practices before and during European colonization.

**Pursesey, Lance (Waseda University)**

[79]

Chair

**Pursesey, Lance (Waseda University)**

[79]

*Walled Sites beyond the Wall: Labeling Liao Towns in Archaeology and Historical Geography*

In the course of its 200+ year tenure the Kitan-Liao dynasty (907–1125) saw large migrations, intensification of settlements, and widespread construction of walled sites of varying sizes north of the Great Wall (N41°+) across the grassland ecotones of North Asia. The remains of some 650 such walled sites are distributed across Inner Mongolia and the Northeastern Provinces (Dongbei) of the PRC, and eastern Mongolia. The number of such sites is over double that of settlements that are named and documented for the region in historical sources. One key reason for this discrepancy is the origin of historical sources as taxation records, when certain settlements may well have functioned outside of taxation systems, or have been constructed but never completed. The study of these Liao sites has been the task of primarily Sinophone archaeologists and historical geographers attempting to match the sites with textual references. This paper will explore the methods and evidentiary foundations of such scholarship and in particular how disputes play out in placing names to sites. Within such debates I will reveal how settlement scale and population migrations are understood when texts encounter archaeology in primarily Chinese-language publications.

Puseman, Katherine [82] see Santarone, Paul

**Pyburn, K (Indiana University)**

[14]

Chair

[39]

Moderator

**Pytleski, Hannah (University of Central Florida), Eileen Murphy (Queen's University Belfast) and J. Marla Toyne (University of Central Florida)**

[45]

*Investigating Mobility through Oxygen Stable Isotopes from the Medieval Cemetery at Kilroot, County Antrim, Northern Ireland*

Mobility is the movement of people across distances, often within cultural or political boundaries, and is influenced by economic, religious, and social processes including individual identities. Anthropologists evaluate mobility of past peoples through oxygen stable isotopes, a biochemical measure to assess long-term water consumption influenced by predictable hydrological and climatological factors. This research reconstructed the Medieval Kilroot cemetery (ca. sixth to sixteenth centuries AD) in Northern Ireland, which is located less than 3 miles from Carrickfergus Castle. Due to the region's notable history of significant movement, from early Christian monastic migration to the later invasions of the Anglo-Normans, Kilroot may reflect isotopic diversity. The analysis assessed bone carbonate isotopic values for 33 individuals, reflecting the last 5–10 years before death, between sex and age groups.  $\delta^{18}\text{O}$  values indicated the sample was homogenous for isotope variability ( $-3.95\text{‰} \pm 0.40\text{‰}$ ) with no statistically significant differences between sex and age categories. This suggests the cemetery had only local individuals buried regardless of identity. However,  $\delta^{18}\text{O}$

values for two subadults were beyond two standard deviations, which may indicate evidence of fosterage/childhood relocation for educational purposes. The study provides a meaningful contribution to the growing literature and discussion of Medieval Irish movement and isotopic variation.

Qin, Gaomin [67] see Monteith, Francesca

**Quinn, Colin (Hamilton College)**

[184]

*Demographic Modeling Using the Mortuary Record*

Human remains are the most direct line of archaeological evidence of people in the past. The mortuary record, however, is the product of the complex interplay between social practices and taphonomic processes. To understand its formation and consequences for understanding the past, archaeologists have developed a rich methodological and theoretical toolkit. Demographic modeling techniques provide one such suite of tools that can inform our understanding about the sizes of communities that came together to bury their dead. I highlight the utility of demographic modeling using the mortuary record with a case study from Bronze Age Transylvania. The European Bronze Age was a period of social, economic, and ideological transformation. Archaeological explanations of how transformative change occurred within the Bronze Age often invoke shifts in population size and density, including issues of migration, political centralization, and the first emergence of large towns. I develop demographic models for Bronze Age Transylvania that take into account the tempo of burial, restrictiveness of burial rites, and the quantity of individuals interred. Mortuary data, in contexts where they are available and can be engaged ethically, provide a complementary line of evidence that can be compared with other estimates of population size from residential data.

Quinn, Colin [45] see Beck, Jess

Quinn, Colin [101] see Budner, Hannah

Quinn, Colin [122] see Hoyt, Delia

Quinn, Colin [44] see Ives, Charlotte

Quinn, Colin [102] see Symmonds, Molly

Quinn, Patrick [59] see Martínez-Carrasco, Andrea

**Quinonez, Jackeline (Universidad San Carlos de Guatemala)**

[85]

*Chuu: The Use and Cultural Impact of Sweat Baths by the Ixil Community in Cotzal, Quiché, Guatemala*

In recent times, sweat baths are customary within Indigenous communities of the Guatemalan highlands; specifically, in the Ixil population, in places such as la sierra de Los Cuchumatanes, San Gaspar Chajul, San Juan Cotzal, and Santa María Nebaj. This region is known for its cold climate due to its altitude (between 1,200 and 3,837 m asl) and has extensive archaeological remains. The steam baths, also known as Chuu in the Ixil language, are used for various purposes, especially those associated with hygiene, health, gestation, reproduction, and birth. This presentation is possible thanks to the people of Cotzal who agreed to share information about the modern use of the Chuu, its ancestral and cultural importance, and what it represents for them and their past generations. The Chuu tradition survived and overcame the atrocities and human rights violations against the Ixil Indigenous communities during the Civil War in Guatemala.

**Quintero Bisono, Diana (University of Colorado, Boulder)**

[181]

*Identity and Heritage: Moving beyond Twentieth-Century Archaeology in the Caribbean*

The development of archaeology in the Caribbean is deeply embedded in the colonialist and imperialist

history of the region. For many years, archaeologists studied the area in a contentious manner, which in turn impacted the local research capacity for fields such as archaeology. The effects of colonialist and imperialist agendas that extended into the twentieth century also impacted the way local communities feel and interpret history and heritage. This project proposes a case study on the development of archaeology in the region in order to assess ways of promoting the work of local scholars and increasing research capacity. By supporting local archaeological research, there is also the potential for increased community engagement in local heritage. By engaging the public in discourses of cultural heritage, there is also the potential for a more concrete understanding of local identity. This work supports heritage preservation, as well as a better understanding of the interactions of identity and race in the region.

**Quintus, Seth (University of Hawaii, Manoa)**

[207]

Chair

**Quintus, Seth (University of Hawaii, Manoa), Jeffrey Clark (North Dakota State University) and David Addison (American Samoa Power Authority)**

[207]

*Small Islands and Constructed Landscapes: A Bayesian Cultural Chronology of the Manu'a Group*

Radiocarbon and other radiometric dating techniques are pivotal for archaeological inquiries about cultural and environmental change. How we use these techniques and interpret their results to analyze and draw conclusions about archaeological data, however, can vary somewhat from one researcher to another, and certainly have varied over time. In Oceania, developments in the analysis of radiometric dates owe much to the work of Tom Dye, particularly his emphasis on the applications of Bayesian statistics and his discussion of temporal process. To honor these contributions, we present, integrate, analyze, and synthesize over 150 radiometric dates associated with three small islands of the Manu'a Group in American Samoa. We document substantial variation in the number of dated contexts across the cultural sequence, which reflects the kinds of research questions that have been posed. We note how the techniques introduced and used by Tom Dye can help us understand the sequence of settlement on the islands, which serves as a useful case study that potentially can be scaled up to larger settings elsewhere in the Central Pacific.

Quintus, Seth [207] see Cochrane, Ethan

Quiros, Franklin [115] see Spenard, Jon

**Raab, Bailey (Northern Illinois University) and Dana Bardolph (Northern Illinois University)**

[46]

*Women Bleed Red: Rendering Women's Spaces Visible in the Archaeological Record*

As Patricia Galloway aptly observed in her 1998 paper, "Where Have all the Menstrual Huts Gone?", menstruation is rarely discussed in archaeological literature. Recent research in the Ohio River Valley has brought renewed interest to these "invisible" spaces, attempting to identify potential menstrual structures in the archaeological record. It was determined through ethnohistoric and archaeological research that menstrual structures likely existed at some archaeological sites and would have been a part of the gendered cultural landscape. Women's spaces, including areas of childbirth and menstrual structures, need to be examined to have a holistic view of gendered landscapes in the past. Paleoethnobotanical research (including the identification of medicinal herbs used during menstruation and pregnancy), collaboration with descendant communities, and further archival research and literature review can contribute to expanding our understanding of this gendered cultural landscape. This paper will examine how combining these methods can lead to a more comprehensive understanding of women's use of space in the past.

**Rabinowitz, Adam (University of Texas, Austin), Liviu Iancu (Inst. for Advanced Studies in Levant Culture and Civilization), Elijah Fleming (Minnesota Historical Society), Patricia Neuhoﬀ-Malorzo (Independent Scholar) and Sterling Wright (Penn State University)**  
[82]

*The Histria Multiscalar Archaeological Project (2018–2022): Multidisciplinary Research and Consilience at the Mouth of the Danube*

This paper reports on the results of the first four seasons of excavation of the Histria Multiscalar Archaeological Project (HMAP) at the Greek and Roman site of Histria, on the Black Sea coast of Romanian Dobrogea south of the Danube delta. Histria was one of the earliest Greek colonies on the Black Sea coast and played a fundamental role in cultural interaction between Greeks, local populations, nomadic groups from the steppe, and eventually Roman settlers across its 1,200-year history. The material record of the site and its hinterland reflects responses to both environmental and political challenges, ranging from major coastline changes to conflict or accommodation with new groups arriving in the Danube borderlands. We describe the application of a range of research methods, including multi-isotope analysis, archaeogenetics, geophysical prospection, and bioarchaeology, to the reconstruction of the history of an area of the urban center of Histria that served as residential space in the sixth and fifth centuries BCE, as a ceramic production center in the fourth century BCE, and as part of the city's extramural cemetery after the contraction of the urban core during the Roman period (second–sixth century CE). The paper includes images of human remains.

**Raczynski-Henk, Yannick (Human Origins Group, Leiden University)**  
[56]

*Early Steps into the Paleolithic Research of the Armenian Highlands*

This session about the current state of affairs into the research of the Paleolithic of the Armenian Highlands (Armenia and Georgia) will be opened with an overview of the research history of the area, providing a framework for the following presentations. The focus of this presentation is on the historical developments in this understudied area of Eurasia.

Raczynski-Henk, Yannick [56] see Kovach, Tanner

**Radde, Hugh (University of California, Santa Barbara) and Weston McCool (University of Utah)**  
[118]

*Shellfish Variability and Its Role in the Adaptation to Fishing Economies on the California Channel Islands*

In this study, we utilize rocky intertidal data from long-term marine biology surveys coupled with targeted archaeological sites on the California Channel Islands to explain the timing of intensified fishing strategies. The Ideal Free Distribution Model (IFD) offers a framework to test predictions relating to human decision making in varying ecological circumstances. Based on the assumptions that (1) shellfish are higher ranked than fish due to their higher post-encounter return-rates and (2) the abundance of principal shellfish taxa varies in regional settings, we hypothesize that shellfish biomass drove subsistence decisions and technological innovations. To test this hypothesis, we create a suitability index based on shellfish biomass to rank habitats. Suitability was calculated based on *Mytilus californianus* population densities (g) and intertidal surface area (km<sup>2</sup>). Island settings with large, bench substrates in highly productive marine environments provided ample shellfish for consumption and extended periods of time before reaching a density-dependent resource depletion threshold. In contrast, environments that are marginally poor in shellfish biomass will reach a fishing threshold sooner in time. This adaptation to intensified fishing practices has implications for emergent sociopolitical strategies and the development of social status on the California Channel Islands.

Rademaker, Kurt [74] see Milton, Emily

**Radnicka-Dominiak, Katarzyna (Jagiellonian University)****[34]***The Maya Wall Paintings of Chajul (Guatemala): Iconography*

The revealing of Chajul mural paintings has opened a completely new chapter in the history of colonial art of Latin America. Most of today's known examples of colonial art are located in churches or other buildings related to religious spheres, while Chajul murals cover walls of private houses of Ixil Maya families. Not only the location of the murals but also their subject is surprising, as it extends beyond usual religious images like biblical scenes, figures of saints, or more symbolic depictions. Murals from Chajul reveal dance-plays, ceremonies, or processions of ritual character that are not entirely understood, and combine indigenous and European elements. Our presentation focuses on iconography—one of the most important aspects of the paintings. Analyzing the figures of dancers—their attire, poses, and objects they use—but also style and technique used by the artist we will attempt to interpret the meaning of that remarkable piece of art.

Radovic, Siniša [47] see Ahern, James

Radovic, Siniša [47] see Becker, Rory

Radovic, Siniša [47] see Jankovic, Ivor

**Raffield, Ben (Uppsala University)****[24]***Chair***Raffield, Ben (Uppsala University)****[24]***Predatory Polities: Viking Raiding Fleets in Ninth-Century Europe*

The Viking Age was a time of upheaval and disruption across the northern world. Beginning in the late eighth century CE, historical documents attest to a surge of viking raiding into western Europe. By the mid-ninth century, predatory raiding fleets are recorded as operating across the North Sea and the British Isles, modern-day France and the Iberian Peninsula, and even making inroads into the Mediterranean. The largest fleets, which were made up of numerous autonomous flotillas comprising not only raiders but also their families, are now widely considered to have functioned as mobile, migratory polities in their own right. Until recently, the organizational structures underpinning the operation of these groups, nor their modes of interaction with the societies that they encountered, have not been closely scrutinized. In this presentation, I will draw together both archaeological and historical evidence in order to examine the ways in which viking fleets mobilized for collective action, in addition to the various tensions that may have had to have been negotiated in order to ensure success in the field.

Raffield, Ben [24] see Birch, Jennifer

**Ragsdale, Corey (Southern Illinois University, Edwardsville)****[251]***Chair***Ragsdale, Corey (Southern Illinois University, Edwardsville) and Marcin Krzepakowski (Museum of Wagrowiec, Poland)****[251]***Migration and Population Structure Among Two Late Medieval Polish Populations*

This bioarchaeological study employs biological distance analyses using dental metrics and morphology of 840 individuals from 25 sites to evaluate changes in population structures in Poland during the High to Late Middle Ages (eleventh to sixteenth centuries AD). Samples represent medieval Polish, German, Czech, Hungarian, Lithuanian, and Kievan Rus populations. Results support a change in population structure in

Poland influenced by migrants primarily from the neighboring Czech Kingdom, and to a lesser extent from the Kingdoms of Germany and Hungary. These changes are especially true for the larger town of Dzwonowo, which is mostly similar to the samples representing the Czech center of Prague. These results confirm historical records for the movement of people from the Czech Kingdom to Poland during the establishment of the town of Dzwonowo, and bring perspective to the unknown population history of the village of Gać. Results also contest historical claims that interactions between Czech and Polish populations were strictly hostile, and that moderate to large-scale migration processes likely occurred between the two regions. Results of intersite variance analysis reflect higher genetic (phenotypic) variance among samples derived from larger sites, highlighting the relationship between urbanization and migration in Central Europe during the Middle Ages.

Ragsdale, Corey [251] see Wegel, Lydia

Rahmonov, Husniddin [141] see Begmatov, Alisher

**Railey, Jim (SWCA, Albuquerque)**

**[25]**

*LA 38326: An Unusual Late Formative Site in Southeastern New Mexico*

LA 38326 encompasses what was apparently a sustained settlement on a high bluff edge overlooking the Pecos River Valley in the Carlsbad area of southeastern New Mexico. The site was first recorded in the 1980s during investigations for the Brantley Reservoir, and recently SWCA and Lone Mountain Archaeological Services conducted work here as part of a project under the BLM's Permian Basin Mitigation Program. The remains of this settlement include several stacked-stone features, both rings and cairns, along with an associated sheet midden of dark, ashy soil and high artifact density. The stone rings may mark individual wickiups, and the cairns are perhaps shrines and/or burial features. There are also numerous bedrock mortars at the site. Diagnostic artifacts suggest the settlement was occupied during the Maljamar phase (AD 1100–1300), and radiocarbon dates partially support this affiliation. This is an unusual site for the Carlsbad region, and in some ways is similar to sites in northeastern New Mexico and in neighboring parts of Texas. This includes the Cielo Complex, far to the south in the Big Bend area of Texas and adjacent northeastern Chihuahua and northwestern Coahuila to the south.

**Raillard Arias, Daniela (Northwestern University)**

**[169]**

*Aerial Drone Photogrammetry of Aboveground Mortuary Architecture in the Amazonian Andes*

For centuries, Indigenous Andean communities known as the Chachapoya placed their ancestral dead in aboveground architecture across the landscape of the Amazonian Andes, in what is now northeastern Peru. The study of Chachapoya ancestral sites presents a series of ethical and practical challenges due to issues of cultural sensitivity, profuse looting, structural instability, site inaccessibility, tourism development, and the legacy of pseudoarchaeology in the region. Thus, I present a minimally invasive approach that combines local spatial knowledge with aerial drone photogrammetry to document, map, and study these sensitive and sacred places located in vertical environments. I discuss a methodology for conducting vertical flight paths to capture photographs of mortuary architecture built into limestone cliff faces. I then outline the process of photogrammetric modeling of drone photographs, developed through the SAROI workshop series. The resulting models enabled the identification of additional mortuary structures and can be further analyzed to reconstruct access patterns, building technologies and spatial relationships. This approach works toward providing an alternative to excavation that is attuned to the cultural and structural sensitivities of Chachapoya ancestral sites, where resulting models can be integrated into local management plans and heritage revitalization efforts.

Raillard Arias, Daniela [36] see Talaverano Sanchez, Arlen

**Rainville, Charles (USDA-NRCS)****[55]***How a Lake Okeechobee Basin Archaeological Complex Is Preserved through Wetland Restoration*

The Lake Okeechobee Basin in Central South Florida was intensively modified by Belle Glades (1000 BCE–1700 CE) communities. The hunter-gatherer-fisher people engaged with complex landscape interactions and alterations, including terraforming in and around wetland sinks and tree islands through pit digging, mound construction, and more, forming an archaeological complex of a dozen sites. Landscape alterations continued by these and subsequent communities through Spanish colonization and beyond. During the early twentieth century, the basin was modified for agricultural use, including cutting canals, excavating borrow areas, cattle pasture, and orange grove creation through swales and water control structures. Recent wetland restoration conducted by the USDA-NRCS has been able to preserve an archaeological complex of sites around a large wetland sink not previously investigated archaeologically. Historic maps and aerial imagery, high-definition lidar-derived DEM maps, and twentieth-century landscape-use records were used to explore and preserve a large and interconnected archaeological complex previously unrecorded. Preserving these sites will allow for a more complete understanding of seasonally wet sites as well as the landscape history of human occupation through deep time in south Florida.

Rajkovic, Dragana [29] see Martinoia Zamolo, Valentina

Rakhmankulov, Erbolat [141] see Dupuy, Paula

Ralston, Clair [227] see Baustian, Kathryn

Ramadan, Tareq [14] see Ryzewski, Krysta

**Ramhorst, Andrea****[182]***Public Outreach by Federal Cultural Resource Specialists from the Wells Field Office*

It is the responsibility of the Wells Field Office (WFO) of the Elko District of the Bureau of Land Management to ensure federal undertakings comply with Section 106 of the National Historic Preservation Act (NHPA) on public lands. In addition to compliance work, WFO culture resource specialists have taken the initiative to develop and participate in outreach, particularly for youth and students. Outreach initiatives developed by the WFO culture resource specialists have focused on educating the public on the cultural, historical, and archaeological resources, with special emphasis on the protection of resources, women in Science Technology Engineering and Mathematics (STEM), underserved communities, and technology in cultural resource management. WFO outreach events have included participation at local and county-wide STEM/science fairs, education programs for Boys and Girls Clubs of America, and Skype-a-Scientist virtual programs, among others.

**Ramirez, Benjamin (University of Texas, Rio Grande Valley)****[237]***Discussant*

Ramirez, Benjamin [237] see Alanis, Jorge

Ramirez, Benjamin [237] see Rojas, Jean-Paul

**Ramirez, Estevan (Northern Arizona University, Flagstaff) and Jaime Awe (Northern Arizona University, Flagstaff)****[74]***The Origins of Sociopolitical Complexity in Western Belize: Investigating Preclassic Occupation in the Site Core of Xunantunich*

Previous studies in the Maya area indicate many lowland Maya site cores developed gradually with continuous construction and modifications extending back to the Preclassic era (1200 BC–AD 300). In spite of this developmental sequence, few sites exhibiting Preclassic transition phases have been intensively investigated. One example is the Belize Valley site of Xunantunich, where more than a century's worth of research in the site core has been dedicated primarily to interpreting the political and socioeconomic role of the site during the Late to Terminal Classic period. Because of these previous research biases, little is known of the Preclassic occupational component of the site core. In an effort to address this omission, we conducted a series of excavations within the site core during the 2022 field season of the Belize Valley Archaeological Reconnaissance (BVAR) Project. These investigations revealed Preclassic architecture and Jenney Creek Phase (900–300 BC) ceramics, as well as Preclassic ceramic figurines. In this presentation, we review evidence of Preclassic occupation in Xunantunich's site core and provide results of our recent investigations in Plazas A-I, A-II, and A-III. Our findings help enhance the understanding of the construction and development of the site core of Xunantunich during Preclassic times.

**Ramon Celis, Pedro (Indiana University, Bloomington)****[108]***Discussant***[146]***Chair***Ramon Celis, Pedro (Indiana University, Bloomington)****[91]***Lidar Mapping of a Zapotec City: Cultural Hybridity and Ethnogenesis in Postclassic Guiengola, Oaxaca*

In this paper, I will discuss how Zapotecs both continued and innovated the construction traditions from the central valleys of Oaxaca in the Isthmus of Tehuantepec by showing the results of the analysis of the lidar scan made during the 2022–2023 field season of the Guiengola Archaeological Project. The archaeological site of Guiengola was one of the sites inhabited by Zapotecs during the late Postclassic period and is depicted in Novohispanic documents as the garrison where Zapotecs defended against the Mexica armies of Ahuizotl. This archaeological site presents a remarkable degree of preservation, so it was possible to create a map of the settlement. Furthermore, by creating a lidar image of this settlement, it was possible to discern the city's urban layout and distinguish aspects of the political and administrative organization of the site. Through this paper, I will discuss how this layout resembles other Zapotec settlements and how people adapted their life to the Isthmus coastal landscape.

Ramos, Frank [48] see Semanko, Amanda

Ramos, Josue [243] see Batty, Sylvia

Ramos Osnaya, Carmen [200] see Punzo Díaz, José Luis

Ramsier, Marissa [30] see Gaddis, Katherine

Ramstad, Morten [173] see Guðmundsdóttir, Lísabet

**Rangel, Esteban (Eastern New Mexico University) and Susan Kuzminsky (California State University)**

[69]

*Exploring Cranial Vault Modification in the Andes Using 3D Imaging Methods*

Intentional cranial vault modification (CVM) has long been considered to be a permanent marker of social identity widely practiced among ancient Andean communities. CVM styles are broadly categorized into annular and tabular types among ancient Andean communities, yet there is substantial variability of among them. In this study, we use three-dimensional (3D) imaging methods to investigate the complexity beyond broad categories of modified head shapes and explore affinities within and between the coastal and highland populations of the Andes who intentionally modified the heads of infants to achieve a particular shape. Using 3D models from a large digital Andean database, landmarks were recorded on the cranial vault and analyzed using multivariate methods to compare types and explore geographical patterns. Results show that (1) 3D approaches objectively discern between types beyond annular and tabular categories or gross observations of morphology typically used to categorize styles, and (2) that individuals from the Andean highland sites used in this study share similarities with one another that differ from communities who lived along the Andean coast. This research expands contextual studies by employing digital methods and a broader geographic approach to examine social identity and intentional cranial modification among precolumbian Andean societies.

**Rangel de Lázaro, Gizeh (Natural History Museum, London)**

[228]

*Chair*

**Rangel de Lázaro, Gizeh (Natural History Museum, London), Marcelo Sánchez-Villagra (University of Zurich), Stacey Ward (Australian National University), Caitlin Raymond (Australian National University) and Laura Wilson (UNSW Sydney)**

[228]

*A Study of the Temporal Sequence and Global Spatial Distribution of Cranial Modification*

Intentional cranial modification (ICM) represents one of the most outstanding biocultural practices of the past in the Americas, resulting from a millennial evolution within distinct cultural territories. When the Europeans first arrived in the Caribbean in 1492, ICM was a widespread tradition among most of the native populations of the continent. Here we present a project aiming to trace the origin and dispersal of these practices. To that end, we collated published records 743 records, spanning 40 countries across five regions, including Central ( $n = 271$ ), South ( $n = 53$ ), and North America ( $n = 54$ ), the Caribbean ( $n = 113$ ), and Eurasia ( $n = 252$ ), registering geographic location (decimal coordinates), ICM type, biological sex, period, and date. Moreover, we estimated the spatiotemporal sequence of head-shaping practice using Empirical Bayesian Krigging. Preliminary results indicate the highest incidence of ICM throughout the New World and identified clusters of diverse modification types and potential areas of missing data due to sampling bias in the archaeological record. Moreover, global overviews of diffusion and convergence are presented. Results suggest that there were probably multiple ICM developments in the different social contexts and modes in which this practice has been documented.

Ranhorn, Kathryn [2] see James, Sydney

Rankin, Lisa [14] see Kelvin, Laura

**Rankle, Chad (University of California, San Diego), Hector Neff (California State University, Long Beach), Gina Buckley (University of Missouri), Andrea Cucina (Universidad Autónoma de Yucatán) and Virginie Renson (University of Missouri)**

[3]

*Evaluating Prehistoric Migration in Pacific Coastal Nicaragua through the Analysis of Strontium Isotope Ratios*

Strontium isotopes are increasingly used to infer migration among ancient populations. The  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio in tooth enamel is primarily influenced by the underlying geology of the region where an individual resided during tooth formation in childhood or adolescence. Older geological formations tend to present a higher  $^{87}\text{Sr}/^{86}\text{Sr}$  ratio, while lower ratios tend to correspond with younger formations. Living plants or animal remains found in archaeological deposits can be used to determine strontium isotope baselines. Here, I present the results of a preliminary study of 11 individuals from Ometepe Island, Nicaragua. By comparing the  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios in teeth collected from each burial to faunal bones recovered from archaeological contexts, one can infer that several individuals may be of nonlocal origin. I also discuss the status of ongoing research, which expands the understanding of environmental  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios along Nicaragua's Pacific coast and further broadens isotopic research of prehistoric migration in Nicaragua.

**Ranum, Caleb (University of Alabama), Alan Farahani (SciScope Solutions), Katherine Chiou (University of Alabama), Julia Sponholtz (TerraXplorations Inc.) and Patricia Mathu (University of Alabama)**

[99]

*A Morphometric Approach to the Study of Archaeological and Modern Capsicum spp. Seeds Using Elliptical Fourier Analysis and Machine Learning Methods*

Traditional morphometric, or shape, analysis of archaeobotanical remains utilizes linear measurements taken in set axes of view (e.g., lateral) to generate quantitative assessments of morphological variation—mainly of carbonized disseminules—between taxa, or within a taxon. In contrast, landmark and semi-landmark analyses (LMA) apply statistical methods to a series of points, or landmarks, on homologous areas of a specimen to identify morphological variation across specimens. A limitation of LMA, however, is that its performance is contingent on the consistent availability of identifiable landmarks. Analyses of non-landmarked outlines of biological specimens with “unornamented” shapes using Elliptical Fourier Analysis (EFA) can accurately distinguish between taxa. In this poster, we present the results of the application of EFA and machine learning methods to more than 450 modern *Capsicum* spp. seeds from six different species (*C. annuum*, *C. baccatum*, *C. chacoense*, *C. chinense*, *C. frutescens*, and *C. pubescens*). Preliminary results indicate that EFA outperforms morphometric techniques reliant on linear measurements alone, but overlapping shape variation makes species detection difficult apart from two species (*C. baccatum* and *C. chinense*). Nevertheless, misclassified species are misidentified as phylogenetically related taxa, suggesting that this method could be useful for identifying specific *Capsicum* lineages in archaeological specimens.

**Raschkow, Wanda (National Site Stewardship Program)**

[167]

*Discussant*

**Raschkow, Wanda (National Site Stewardship Program)**

[167]

*Variations on a Theme: Expanding Site Stewardship*

Site stewardship programs enlist volunteers to monitor for and report disturbances at archaeological sites. The majority of stewards are older, often retired, with flexible schedules that allow them to visit remote sites on a regular basis. In order to expand participation, and to protect more resources, stewardship programs need to look beyond the one-person—one-site model. Alternative models include “Petroglyph Patrols” and Site Ambassadors. Each of these models shifts the focus to front country or highly visited sites and enlists multiple people to help monitor a single site. Stewards in these programs interact with the public and can be effective at teaching people to visit sites without damaging them. These approaches, as well as virtual

stewardship programs, invite participation by those who might not otherwise become involved with stewardship.

Rascona, Steven [75] see Montero, Laurene

**Rasic, Jeffrey (National Park Service)**

**[89]**

*Late Pleistocene Stemmed Points in Arctic Alaska*

Large, shoulderless stemmed bifacial projectile points are a hallmark of the late Pleistocene age Sluiceway complex represented in more than two dozen sites northern Alaska. This paper discusses the dating of this technology and potential relationship to fluted projectile point and microblade technologies, which are roughly co-eval in this region. Sluiceway complex projectile point technology is examined in light of high-latitude environmental challenges of marked seasonality and fleeting subsistence resource availability, as well as a unique lithic raw material landscape characterized by abundant, high-quality chert.

Rasic, Jeffrey [15] see Goebel, Ted

Rasic, Jeffrey [15] see White, John

**Raskin, Levi (Haverford College), Jonathan Reeves (Max Planck Institute for Evolutionary Anthropology), Matthew Douglass (University of Nebraska, Lincoln) and David Braun (George Washington University)**

**[41]**

*Least-Effort Knapping as a Baseline to Study Social Transmission in the Early Stone Age*

Variation in lithics has been used as a mechanism to infer diachronic aspects of hominin behavior. The emergence of the Acheulean industry is considered a major milestone in the evolution of hominin cognition. This perspective is predicated on the idea that Acheulean large cutting tools (LCTs) require mental templates imposed through knapping and that LCTs are reflective of an information transfer system like that seen in human-like culture. This assertion has recently been questioned. A critical gap in the study of socio-cultural mechanisms on Early Pleistocene stone tools is the development of null hypotheses for the presence of human-like culture. A baseline examining the effect of unguided flaking on typo-technological diversity is necessary. We reduced basalt using a random number generator to select the striking platform for each removal. Using 3D geometric morphometrics, we compared the least-effort assemblage to those recovered from the Koobi Fora Formation (Kenya). Randomized removals frequently produce LCTs that approximate the shape variation seen in Plio-Pleistocene LCTs. Therefore, the patterns seen in the Early Acheulean could be produced from a simple flake-core technology (like the Oldowan) preferentially knapping elongated cobbles. This result casts doubt on many hypotheses regarding hominin culture and cognition in the Early Pleistocene.

Raskin, Levi [33] see Reeves, Jonathan

**Rasmussen, Amanda**

**[187]**

*Discussant*

Rasmussen, Amanda [18] see Burns, Jonathan

Rasolondrainy, Tanambelo [16] see Douglass, Kristina

**Ratcliffe, Jessica (Northern Arizona University)****[69]***Demarcating Space and Creating Place: Examining the Processes for Creating Sacred Landscapes by the Ancient Maya of Western Belize*

The ancient Maya of the Belize River Valley maintained a strong, spiritual connection with nature, one that can be explored through the layers of religious symbolism imbued into their built environments. In Xunantunich during the Late Classic period, the Maya created a sacred space by incorporating symbols—such as stelae, altars, and cache deposits—into their urban layout. Although Maya religious symbology has been a popular subject of study in Maya archaeology for decades, there is still much to be discovered about how these expressions of Maya cultural identity determine a sacred space. The question that guides this research is, In what ways did the people of Xunantunich ritually charge their built environment with sacred symbols of the natural world? To answer this question, I conducted architectural analysis in Xunantunich and comparable sites in the Belize River Valley, and used photogrammetry to build a 3D model of Plaza A1. This method underscores the importance of analyzing spatial context in architecture. The objective of this research is to expand the Maya archaeological record and provide a deeper understanding of how precontact civilizations prospered over centuries while maintaining a sense of veneration for the natural landscape.

Rautman, Marcus [126] see Czujko, Stephen

**Ray, Erin (University of New Mexico) and Nadia Neff (University of New Mexico)****[99]***Technological Advances in the Field? Using a Tablet in a Remote Field Setting*

As archaeologists, we can be slow to adopt new technology in the field. Sensitive documents such as field notes and maps are often still done by hand for fear of data loss. Working in remote field settings with limited or no electricity can amplify this concern. This case study examines the use of an iPad for recording field notes, creating maps, and methods to back up all these data while without electricity. After using a tablet successfully in the first field season (2019), we collected additional data during the second field season (2022) and implemented additional protective methods to back up information. Lacking traditional electricity, we had access to portable solar panels and small battery packs to power both iPads and iPhones. While these methods were employed using Apple products, they also could be employed using Android products. Being able to annotate quick pictures in the field helped tremendously when trying to reconstruct certain contexts when we returned to the lab. Ultimately, we would recommend these methods be adopted broadly as the reduction in time spent both collecting data in the field and postprocessing data permitted researchers to spend more of the limited field time excavating, thus increasing overall productivity.

Ray, Erin [252] see Neff, Nadia

Rayfield, Kristen [100] see Singleton, Robin

Raymond, Caitlin [228] see Rangel de Lázaro, Gizel

**Razo, Mikaela (Center for Archaeological Research, University of Texas, San Antonio) and Marissa Muñoz (University of Texas, San Antonio)****[149]***Introducing Educational Methods to Archaeological Content and Practice: A Follow-Up Study of K–12 Summer Camp Curriculum Building*

Due to the COVID-19 pandemic, outreach within archaeology is changing to meet the needs of its communities, including the methods used by archaeologists to disseminate information and engage diverse

age groups. “Legacy: Hands on the Past” is an archaeological outreach program based out of the Center for Archaeological Research at the University of Texas at San Antonio. The program engages K–12 students and the broader public in exploring the rich historical record, diverse local heritage, and historic preservation of San Antonio. Over the summer of 2022, Legacy put into practice the curriculum, built during the year-long pause brought on by the COVID-19 pandemic, with two groups of children aged 9–13. During these one-week summer camps, our feedback from campers influenced the structure of activities they participated in and the content they learned. In this paper, we present our findings on the process of our collaborative project from the conceptualization and foundation of the curriculum to the approaches we implemented and the responses we received.

**Reamer, Justin (University of Pennsylvania)**

[77]

*Unbounding the Land: Reinterpreting Late Woodland Lenape Villages in the Upper Delaware Valley*

The traditional definition of Indigenous villages in the Eastern Woodlands can be considered synonymous with the archaeological site. Villages are bounded discrete entities that often curiously mirror historic or current property lines. While presumed agricultural field areas may be considered in these conceptions, villages, hamlets, farmsteads, camps, and so on are still bounded using Western, Eurocentric notions of space and do not reflect the lived experiences of the Indigenous people who formed the archaeological record we study. In this paper, I will explore how the dividing of sites based on past property lines in the Upper Delaware Valley impacts our interpretations of the archaeological record. In particular, I will focus on the Minisink National Historic Landmark (NHLM), which is comprised of 19 separate archaeological sites. Only a portion of the Minisink NHLM is considered part of the large Late Woodland Lenape Village present there. I will argue that the entire 1,320 acres of the Minisink NHLM, and perhaps more, should be conceived of as a singular place and not distinct sites. In reconceptualizing the Minisink NHLM as a singular place, we can better approach how the Lenape actually lived in and used the area.

Redlin, Hannah [104] see Badillo, Alex

**Redman, Kimberly (Alpine Archaeological Consultants)**

[4]

*Discussant*

**Reed, David (Ohio State University)**

[125]

*New Methods, Old Data: Reanalysis of Diets of the Copán Classic Maya Using Stable Isotope Mixing Models*

Sex and age factor into ancient diets. This poster revisits the largest single Maya polity paleodiet study using approaches that have been developed since the original data were collected, and to incorporate newer knowledge of Maya foodways in developing a better reconstruction of Late Classic Copán diets. Results of Stable Isotope Mixing Models (SIMM) of ancient Copán foodways reinforces and augments prior conclusions for a maize-rich diet at all social levels with key group differences between adult males and females, and between the younger and oldest females, indicative of dietary changes that corresponded to age-related social responsibilities. SIMM analysis has become increasingly sophisticated and versatile for quantifying food web attributes. The capabilities of SIMMs can provide uncertainty levels to account for variability in consumer or food isotopic values, rather than simplistic dietary proportions of two or three food sources. More recently, Bayesian SIMMs have been developed that allow flexible model specification in a rigorous statistical framework incorporating some or all of these features: uncertainties, concentration dependence, larger number of sources, etc. With alternative linear programming approaches, it is possible to use ranges of isotopic values to determine ranges of source contributions even in underdetermined situations.

Reed, David [125] see Gonlin, Nancy

**Reed, Paul (Archaeology Southwest)****[106]***Expanding Our Approaches to American Archaeology: An Example from the Greater Chaco Landscape*

American archaeology has been in the midst of a transition for many years. Long-suppressed and ignored viewpoints are finally seeing light and interpretations are broadening. In particular, archaeologists are working with Indigenous peoples with new and innovative approaches to understanding the past. As a result, archaeology is changing, although the pace of change is slow. In this presentation, I offer an example from the Greater Chaco Landscape in New Mexico. By working with different Indigenous groups over the last several years, we have increased our understanding of ancestral land use and the great time-depth of connections to Chaco Canyon and the San Juan Basin. This work has also revealed the limitations of a Western-based, colonial approach to the past and illustrates the need for more comprehensive changes to our discipline.

**Reed, Sara (Barnard College)****[123]***The Meaning of Water: One Mountain's Tale of Water Politics and Heritage in Northern New Mexico*

Jicarita Peak, a looming shoulder of the Sangre de Cristo Mountains in northern New Mexico, is a convergence of disparate peoples, cosmologies, and politics. The mountain is a crucial part of a vast watershed that extends from its 12,000' slopes down to the Rio Grande and is home to Picuris Pueblo, North America's oldest continually inhabited settlement. Over the past three centuries, the watershed has become home and life source to a range of communities, both Indigenous and settler-colonial, introducing questions of heritage, belonging, and acknowledgment of ancestral and contemporary presences. This project considers the role archaeological heritage plays in current and future struggles around water sharing and the urgency to document a cultural landscape that will be irrevocably changed as global temperatures rise and access to water becomes ever more critical.

**Reedy, Chandra (University of Delaware)****[216]***Micro-CT Scanning with 3D Image Analysis of Pore Systems in Sherds as a Tool to Understand Performance Characteristics of Archaeological Ceramics*

Characterizing a ceramic pore system reveals information about use properties and functionality. Pores making up the system include some that are isolated and others with connections to other pores, some connected to the ceramic surface and others interior-only, and variation exists in pore size and shape and connection size and directness. The structure of this pore system impacts functional aspects of the ceramic such as permeability, liquid diffusion, thermal conductivity, and mechanical strength. Desktop high-resolution micro-CT systems generate images from sherd samples nondestructively with spatial resolution sufficient to measure many pore variables. Using the 3D image analysis software program Dragonfly, segmentation of pores from particles and matrix is improved with models from machine learning and deep learning with convolutional neural networks. A multi-stage image analysis protocol can then examine variables related to ceramic function such as total volume porosity, percentage of pores accessible to the surface versus isolated interior ones, statistical properties of pores related to size and shape, percentage of unconnected pores, average number of connections between pores, and the length, diameter, and directness of those connections; a porous microstructure analysis can also study the permeability and thermal conductivity of the ceramic system as a whole.

**Reedy, Chelsea (Texas State University)****[71]***Food and Fortitude: A Story of Life within Presidio San Sabá as Told through Zooarchaeological Analysis*

Presidio San Sabá was the largest military outpost in the Texas region during the mid-eighteenth century. This research project is a continuation of Dr. Fradkin and Dr. Walters's previous faunal analysis conducted on a portion of the site's assemblage. This inquiry will focus on comparing the areas within the interior plaza to

provide insight into dietary practices and to see if socioeconomic status use of certain areas can be inferred. This study will incorporate the use of their hunted versus domestic resources, aquatic versus terrestrial animals, element selection, butchery practices, size class, hunting practices, and the potential consumptions of horses and bison.

Reel, Megan [44] see Nelson, Fox

**Reents-Budet, Dorie (National Museum of Natural History, Smithsonian Institution) and Ronald Bishop (National Museum of Natural History, Smithsonian Institution)**  
[238]

*Between a Rock and a Hard Spot: Museum Collections and Mesoamerican Archaeology*

The changing relationship of US art and natural history museums and other collections-holding institutions and the field of archaeology as anthropology is examined in this presentation. We assess the past 100+ years' amassing of archaeological objects as cultural curios, aesthetic objects, and published or unpublished assemblages (both institutional and private). The paper demonstrates the value of analyzing these mostly unprovenienced (or excavation-orphaned) collections using objective analytical approaches in concert with provenienced objects and archaeological data. The paper concludes with a discussion of the changing collections practices of US art museums and how (or how not) outside pressures motivated these changes.

**Reese, Kelsey (Los Alamos National Laboratory), Sean Field (University of Notre Dame) and Robert Weiner (University of Colorado, Boulder)**  
[176]

*Machine Learning R-CNN Identification of the Entirety of the Southwest Regional Road Network*

The United States Geologic Survey is intermittently releasing publicly available 1 m resolution lidar of the contiguous United States through the 3-Dimensional Elevation Project. Over the past several years, large sections of lidar across southeast Utah, southwest Colorado, New Mexico, and small portions of Arizona have been released—creating an unprecedented perspective of the Ancestral Pueblo footprint still embedded across the US Southwest at a landscape-wide scale. Examining the lidar imagery reveals a vast network of linear and circular road-like features far more extensive than those typically attributed to the Chaco regional network, and many associated with communities primarily occupied beyond the height of the Chaco period. This poster will present results from a Regional Convolutional Neural Network created to systematically identify all road features across the greater Four Corners region.

Reese, Kelsey [224] see Linford, Samantha

**Reese-Taylor, Kathryn, Felix Kupprat (Universidad Nacional Autónoma de México), Armando Anaya Hernández (Universidad Autónoma de Campeche), Nicholas Dunning (University of Cincinnati) and Adriana Velazquez Morlet (Instituto Nacional de Antropología e Historia,)**  
[204]

*Lidar Reconnaissance of the Calakmul Urban Landscape*

Building on the work of William J. Folan, the Bajo Laberinto Archaeological Project, initiated in 2022, is focused on investigations of urbanism centered on the city of Calakmul in southern Campeche. An initial 100 km<sup>2</sup> lidar survey along the northern rim of the Bajo Laberinto has revealed large, elaborate multi-courtyard residential groups, as well as extensive landscape modifications, that likely signal a shift in social and economic organization in the Bajo Laberinto region during the Late Classic. Remarkably, we have discovered that despite being created over 40 years ago, the map of Calakmul by May Hau, Couoh Muñoz, and Folan is exceptionally accurate. Differences principally lay in the details and extent of the architectural arrangements and landscape modifications, which were, no doubt, very difficult to discern using survey methods of the 1980s. Significantly, early studies of structure density support our hypothesis—derived from Folan's

investigations—that Calakmul and the surrounding area was the most heavily populated region in the prehispanic Maya lowlands.

Reese-Taylor, Kathryn [17] see Dunning, Nicholas  
 Reese-Taylor, Kathryn [17] see Lentz, David  
 Reese-Taylor, Kathryn [147] see Longstaffe, Matthew  
 Reese-Taylor, Kathryn [189] see Lockett-Harris, Joshua  
 Reese-Taylor, Kathryn [152] see Parrott, Nathan  
 Reese-Taylor, Kathryn [93] see Vázquez López, Verónica

**Reeves, Jonathan (Max Planck Institute for Evolutionary Anthropology), Levi Raskin (Haverford College), Matthew Douglass and David Braun (George Washington University)**

[33]

*Establishing Baselines for Stone Tool Variation Across the Early Pleistocene: A Least Effort Approach*

Our understanding of the evolution of human behavior is largely predicated on how stone tools vary through time and across space. Despite a long history of research, the behavioral processes associated with Early Pleistocene lithic technology remain debated. Some research suggests that lithic variation reflects socially transmitted information governing the technical decisions of hominin knappers. In contrast, others argue that this variation is simply a product of its environmental context. However, research still lacks a basic understanding of how much variation can arise due to stochastic processes. Here, we present experimental work designed to investigate the behavioral significance of Early Pleistocene lithic technology using a randomized knapping protocol. We reduced a series of blanks by using a random number generator to determine the location of each flake removal. A series of 3D analyses were then used to compare the morphological and technological variation produced by this experiment to core and flake technology from the Koobi Fora Formation. Our comparison shows that a substantial amount of the lithic variation from Koobi Fora can be generated by randomly removing flakes. These results provide a useful baseline to discuss the mechanisms driving stone tool variation.

Reeves, Jonathan [69] see Borsodi, Sara  
 Reeves, Jonathan [168] see Braun, David  
 Reeves, Jonathan [168] see Li, Li  
 Reeves, Jonathan [41] see Raskin, Levi

**Regnier, Amanda (University of Oklahoma), Scott Hammerstedt (University of Oklahoma) and Patrick Livingood (University of Oklahoma)**

[99]

*Preliminary Results of 2022 Excavations at Spiro Mounds in Oklahoma*

This poster will provide an overview of the 2022 excavations at Spiro by the University of Oklahoma field school, which involved work at two areas of the site. The poster will discuss the geophysics results that lead to excavating these areas, the preliminary results from the 2022 excavations, our preliminary interpretations that the two areas represent special purpose buildings, and what is known generally about special purpose buildings at Spiro.

Reich, David [244] see Schmaus, Tekla  
 Reich, David [58] see Sedig, Jakob

**Reichert, Susanne (University of Michigan)**

[79]

*How to Describe Mongol Period Urbanism on the Mongolian Plateau*

The paper will introduce and discuss a set of themes deemed crucial for the understanding of settlement practices on the Mongolian plateau during the time of the Mongol Empire. The past 20 years witnessed a

burgeoning of research endeavors regarding Mongol period settlement sites. Mongolian, Japanese, Russian, German, and US archaeologists made tremendous strides in the exploration of this understudied subject. It is therefore time to synthesize these results going beyond the paramount example of Karakorum, the first capital of the Mongol Empire, which can be certainly deemed the best-known example of the more than 50 sites known to us. The proposed themes cover a diverse set of questions concerning environmental and climate changes, typology with regard to form and function, chronology, founders, material resources/labor acquisition/architecture, social fabric of the population, and mobility and seasonality. These themes will help to characterize the origins and trajectory of the Mongol period settlements. They also serve to provide a set of variables against which earlier and later approaches to settlement can be compared against.

**Reid, Amy (Center for Archaeological Studies, Texas State University)**

[154]

*Prehistoric Lithic Economies at the Spring Lake Site, San Marcos, Texas*

The Spring Lake Site (41HY160) in San Marcos, Texas, has been referred to by archaeologists as one of the longest, most continuously inhabited sites in North America. The diversity of hydrological, biological, and geological resources has made Spring Lake an attractive locale for human groups from the late Pleistocene to today. Archaeological investigations in and around Spring Lake have been on-going since the 1970s and have built a body of evidence to support this assertion. Artifact collections generated during these projects, curated at Texas State University's Center for Archaeological Studies, contain generous lithic assemblages worthy of analysis and interpretation. The 2002–2006 Field School and 2014 Spring Lake Data Recovery collections provided an exciting opportunity to investigate changes in mobility strategies and lithic technological organization at this site through time. This paper will review preliminary analyses conducted on these lithic assemblages, the results of which point toward a more maintainable and curated toolkit associated with collector strategies during the Early and Middle Archaic and a transition to foraging strategies during the Late Archaic. Implications for the larger understanding of past human behavior at Spring Lake will be discussed, as well as plans for new research objectives and analyses of curated collections.

**Reid, David (University of Illinois, Chicago), Caleb Kestle (University of Illinois, Chicago), Elizabeth Goodman (University of Illinois, Chicago), John Monaghan (University of Illinois, Chicago) and Keith Phillips (University of Illinois, Chicago)**

[176]

*GIS and Remote Sensing Applications in the Search for World War II POW/MIAs in the Philippines*

Over 81,500 US servicemembers remain missing from America's past conflicts extending to World War II (WWII). The great majority of this number, more than 72,000, relate to WWII alone. For the past several years, the University of Illinois, Chicago (UIC) has partnered with the Defense POW/MIA Accounting Agency (DPAA) on the recovery of WWII personnel in the Philippines. Here we present a methodological approach used by the Center for the Recovery and Identification of the Missing at UIC that utilizes GIS and remote sensing applications in the archaeological search for missing personnel. GIS provides a critical tool for managing, visualizing, and analyzing historical spatial data related to missing individuals and aircraft from WWII. In this poster, we present various GIS applications/products, including: (1) Aircraft crash models that incorporate local topography and historical data (e.g., last-seen XY coordinates, flight paths, topography, aircraft height and speed, weather conditions, etc.); (2) Reconstruction and identification of past battlefields; and, (3) Modern landscape change from the last 80 years to the present. Methods outlined in this poster include the analysis and use of historical maps and sketches, aerial photographs from WWII, various satellite imagery sources (e.g., CORONA historic imagery), and GIS spatial analyses.

**Reid, Kenneth (Idaho State Historical Society)**

[37]

*Reservoir-Corrected Musselshell Dates for the Cascade Phase on the Lower Snake River*

Freshwater mussel shell is common at alluvial sites on the Columbia Plateau, and often used for radiocarbon

dating of early and mid-Holocene sedimentary deposits of archaeological or geological interest. Paired radiocarbon ages on freshwater mussel shell and charcoal have shown acceptable agreement at sites on the middle and lower Salmon River in Idaho, and at Marmes Rockshelter on the Palouse River in southeastern Washington. However, confronted with their lack of agreement along the middle and lower Snake River, archaeologists have variously acknowledged, passed over without comment, or offered corrections incorporating shell samples derived from outside the Snake River hydrological basin. This paper examines paired shell/charcoal ages for mid- and early Holocene sites along the lower Snake River, focusing on the Cascade phase of the Leonhardy and Rice cultural sequence. Since the 1960s this taxon has been plagued by chronological ambiguity, with age ranges estimated at between 8000 and 4500 RCYBP. However, when the mussel shell dates are revised using reservoir-corrected regression equations based on paired samples restricted to the Snake River basin, results suggest that the Cascade phase as originally defined is mid-Holocene and post-Mazama rather than early Holocene and pre-Mazama in age.

Reidsma, Femke [159] see Dusseldorp, Gerrit

**Reilly, Sophie (Northwestern University)**

[190]

*Strategizing Food Security under Colonial Rule at Transconquest Purun Llaqta del Maino, Chachapoyas, Peru*  
How does colonialism impact local food strategies? This paper considers this question at Purun Llaqta del Maino (PLM), Chachapoyas, Peru, a site with continuous occupation from the Late Intermediate period (LIP) (AD 1000–1450), the Late Horizon (1450–1535), and the Early Spanish colonial period (1535–1700). Like many Andean regions, Chachapoyas was colonized in the sixteenth and seventeenth centuries by the Inka and Spanish in quick succession. Such colonial expansions can affect food systems by introducing new foods, extracting food and labor through taxes, and introducing or reifying inequalities that alter food access. I present microbotanical and macrobotanical results from household and public contexts from the LIP through Spanish colonial occupation to investigate variations in food availability and access over time. I consider availability a measure of food acquisition on a community-wide scale, which I measure by tracing ubiquity of plants through time. Access, on the other hand, relates to individuals' or households' ability to acquire available foods. I employ intra-household comparisons to trace access. Combining data on availability and access, I consider the ways imperial impositions affected PLM foodways, as well as the strategies that inhabitants employed to negotiate these changes with their biological and cultural needs for adequate foods.

Reinhard, Karl [66] see Mullen, Damon

**Reinhardt, Bob (Boise State University)**

[62]

*Finding Old Detroit: Recovering and Interpreting the Histories of Communities Displaced by River Development Projects*

Driving along Highway 22 in the western Cascade mountains of Oregon, motorists can't help but notice Detroit Lake (created by Detroit Dam, a US Army Corps of Engineers multipurpose river development project) and the small town of Detroit on the reservoir's banks. But they can't see the site of Old Detroit, the small community inundated by the reservoir; nor can they know too much about the community's history, which is similarly buried in small archives, the footnotes of old newspaper articles, the deep recesses of US Army Corps of Engineers archives, and in the fast-fading memories of former residents and descendants. This paper explains the author's multidisciplinary efforts to recover and interpret the history of Old Detroit, and the lessons learned about how to find, understand, and value such lost places.

**Reinhart, Katharine, Alexander Patterson (University of Massachusetts, Boston) and David Landon (University of Massachusetts, Boston)****[135]**

*Coastal Continuity on the Wampanoag Landscape: Recent Analyses of the Woodland Period Occupation at the Cole's Hill Archaeological Site (19-PL-984) in Plymouth, Massachusetts*

Archaeological excavations in 2021 recovered important new information about the Coles Hill Archaeological Site (19-PL-984), a Wampanoag site overlooking the waterfront in Plymouth, Massachusetts. Despite the location on a heavily developed urban lot, a preserved portion of the site featured intact stratigraphy yielding in situ cultural features, pottery sherds, a wide array of local and exotic lithic materials including diagnostic lithic artifacts, evidence of local shellfish resource exploitation, and macrobotanical remains recovered from secure feature contexts and appropriate for radiocarbon dating. Subsequent AMS radiocarbon dating revealed that the site was occupied from as early as 394 BC (2,344 BP) and up to at least 1457 AD (493 BP). With evidence revealing a Jack's Reef component, the earliest directly dated macrobotanical maize specimen in the region, and seventeenth-century European material culture recovered from the area's buried A horizon, this coastal site documents almost 2,000 years of vibrant indigenous life before and up to the eve of European contact. This paper presents the current analyses and interpretations of this site, and discusses the invaluable opportunity Cole's Hill offers to further bring to the fore the role and lifeways of Indigenous peoples in the region.

Reinhart, Katharine [147] see Harper, Ross

Reis Cordeiro, Julia [46] see Bond Reis, Lucas

**Rellini, Ivano (University of Genoa, Italy), Sabina Ghislandi (University of Genoa, Italy), Gabriele Martino (3Collaborator of the Soprintendenza Archeologia), Julien Riel-Salvatore (Université de Montréal) and Roberto Maggi (Istituto Internazionale di Studi Liguri, Italy)**  
**[87]**

*Pleistocene–Holocene Transition at Arene Candide Cave, Liguria (Italy): A Geoarchaeological Approach*

Arene Candide is a cave located along the coast of Liguria and repeatedly excavated for scientific studies since the second half of the nineteenth century. The sedimentary sequence has been accumulated within the cavity from Pleistocene to Holocene, conferring to this site an essential role for the understanding of the Paleolithic and Neolithic of the Western Mediterranean. In the latest years, the application of soil micromorphology to cave contexts has given the opportunity to explore and analyze the depositional levels in relation to human activity, climate and environmental changes, and their interactions. In this contribution, we illustrate the micromorphological and sedimentary results from our recent study of a stratigraphic sequence exposed in the early 1970s, covering the transition from the Pleistocene to the Early Holocene occurring during the Late Glacial. The aim is to increase the knowledge regarding the anthropic occupation and use of the cave, including the comparison with similar realities from this area (Arma dello Stefanin) and contributing to the wider discussion of the climatic and cultural transition in the Mediterranean Sea.

Rempel, Chris [62] see Edwards, Briece

Rennie, Samuel [61] see Gonzalez, Silvia

Renson, Virginie [126] see Czujko, Stephen

Renson, Virginie [3] see Rankle, Chad

Renson, Virginie [48] see Schollmeyer, Karen

Retiz-García, Mario [13] see Cifuentes, Gerardo  
 Retiz-García, Mario [13] see Corona, Néstor  
 Retiz-García, Mario [13] see May-Crespo, Jose  
 Retiz-García, Mario [13] see Velázquez-Maldonado, Luis

Reusch, Kathryn [89] see Shield Chief Gover, Carlton

Reuther, Joshua [15] see Crass, Barbara  
 Reuther, Joshua [130] see Doering, Briana  
 Reuther, Joshua [15] see Holmes, Charles  
 Reuther, Joshua [15] see Kielhofer, Jennifer  
 Reuther, Joshua [15] see Lanoë, François  
 Reuther, Joshua [29] see LaZar, Miranda  
 Reuther, Joshua [15] see Potter, Ben

**Rey de Castro, Alejandro (University of Florida) and Augusto Oyuela-Caycedo (University of Florida)**

[66]

*San Jacinto and the Origins of Pottery Making in the Americas: A Technological Perspective*

Excavations at various archaeological sites located in the northern coast of Colombia have yielded evidence of early ceramic production and, in the case of San Jacinto, the earliest so far unearthed in the Americas, dating back to 6000 years BP. San Jacinto ceramics are characterized by the use of an organic-tempered clay and the presence of highly decorated lugs. Due to the incipient stage of ceramic manufacture during the occupation of the site, an experimental phase is expected; hence, a high variability in technological, compositional, and decorative attributes is likewise to be expected. In this paper, the results of a techno-compositional analysis carried out by means of digital microscopy to a sample of ceramic sherds from San Jacinto are presented and discussed. These results confirm the technological and compositional variability within the sample and provide evidence for a heterogenous early ceramic production. Consequently, San Jacinto pottery evinces the nature of early ceramic production as an individual, nonspecialized practice and constitutes the starting point for a broader research program focused on understanding the transition from individual to collective manufacture or from nonspecialized to specialized production in the Americas.

**Reyes, Mara (Universidad de San Carlos de Guatemala), Lilian Corzo (Ministerio de Cultura y Deportes) and Rocio Albarrán (Universidad Autónoma de Yucatán)**

[11]

*Entre montañas y ríos: La población del sureste de Petén tras el colapso maya (800 aC al 1000 dC)*

El sureste del Petén está conformado por una diversidad de paisajes geográficos y ambientales que permitieron el desarrollo de asentamientos prehispánicos claramente jerarquizados desde épocas muy tempranas hasta muy tardías, incluyendo los dos siglos que siguieron al ocaso de los grandes reinos mayas. En esta ponencia se presentarán los datos relevantes sobre el tema que—durante más de 35 años de registro e investigación—han sido recopilados sistemáticamente por el Programa Nacional del Atlas Arqueológico de Guatemala del Ministerio de Cultura y Deportes. Cubriendo más de 8,600 km<sup>2</sup> de reconocimientos sistemáticos, se discutirán los cambios en el patrón de asentamiento, arquitectura, complejos cerámicos y epigráficos relacionados a una de las últimas etapas de ocupación (800 aC a 1000 dC). Estudios paleogenómicos recientes llevado a cabo por el Laboratorio Reich (Universidad de Harvard) en sus pobladores tardíos, agregan nuevas pistas sobre el remplazo poblacional y por tanto la velocidad y la direccionalidad de los procesos migratorios. Puestos en contexto con los datos convencionales sobre esta área y aquellas colindantes, permiten revitalizar la discusión sobre la dinámica del colapso de los reinos mayas del Clásico y poner de relieve las diversas formas en que los contactos biológicos y culturales se dieron.

Reyes-Centeno, Hugo [148] see Bonzani, Renee

Reynard, Linda [94] see Hoffman, Matthew

Reynolds, Robert [106] see Lemke, Ashley

Reynolds, Sally [248] see Bennett, Matthew

**Rezek, Zeljko (Collège de France)**

**[33]**

*Chair*

**Rezek, Zeljko (Collège de France)**

**[168]**

*Is There (and What Is) a “Nubian-Levallois” from the Etic Perspective of Flake and Fracture Formation?*

Lithic experimentation and the understanding of the so-called nubian-levallois technology are just two among many aspects of Harold’s legacy. The results of so far the only controlled experiment on core surface morphology, some of which resembles nubian-levallois in featuring a prominent medial-distal ridge, revealed its dynamic relationship with platform variables in forming a flake, potentially overriding the (un)controlled or (un)wanted effects of these variables on flake size and shape. This paper builds on this insight, and additionally brings the mediating effects of platform width and bulb size into this relationship for its more comprehensive model. In the absence of archaeological nubian-levallois blanks, to test the proposed model here I use a newly excavated sample of complete pointed blanks from the upper deposits of Ain Difla rockshelter in Jordan. These blanks were produced by bidirectional flaking and they feature distal removal negatives and a medial-distal ridge. I compare this sample with the rest of complete blanks from the same deposits that are of various shapes and have no medial-distal ridge and mostly centripetal and unidirectional removals. The paper further discusses the latent trade-offs of nubian-levallois-like morphology in flaking economy and contextualizes the results within a broader evolutionary perspective on lithic technology.

Rezek, Zeljko [33] see Nassr, Ahmed

**Rhoads, Tyler (Texas State University), Jerod Roberts (Texas State University), Bryan Heisinger (National Park Service) and Victoria Roberts (Texas State University)**

**[112]**

*Geospatial Methods at Huaca del Loro*

Throughout the 2019 and 2022 field seasons, geospatial data were collected at Huaca del Loro using a combination of traditional and digital mapping techniques. Sand covers every corner of the site, so in 2019 a ground-penetrating radar was utilized to identify buried structures. This led to the discovery of a D-shaped temple that became the focus of the 2022 field season. Unit maps were drawn to scale and used in conjunction with a total data station, GIS, and Structure-from-Motion photogrammetry (SfM). SfM uses overlapping photos and ground control points to generate a scaled 3D representation of the photographed area, showing the exact spatial orientation of features, structures, and units. In addition to these methods, photos were collected using a drone to generate a high-resolution aerial base map, and sketch maps created by previous researchers were digitized and georeferenced in order to better understand the context of data that was gathered during previous excavations.

**Rhode, David (Desert Research Institute)****[43]***Plant Use at Bonneville Estates Rockshelter, Nevada*

Bonneville Estates Rockshelter is a stratified multicomponent site located on the former highstand of Pleistocene Lake Bonneville in the eastern Great Basin. It contains well-dated and well-preserved record of human occupation through the last 13,000 years. Here I report on dietary plant remains retrieved from nearly 140 dated archaeological features (predominantly hearths and pits) spanning the period of occupation. Seeds, roots, and other tissues represent several major taxa including: cacti (various species); amaranth family (including saltbush, goosefoot, and iodinebush); ricegrass and other grass seeds; bulrush; pinyon pine; and other lesser contributors. The Bonneville Estates Rockshelter plant record provides evidence for the long-term, increasing use of key plant taxa by the shelter's occupants from the terminal Pleistocene through the Holocene, and documents the changing use of diverse habitats through time in response to fluctuating environmental conditions.

Ricci, Giorgia [166] see Herve, Gwenael

**Richard, Francois (University of Chicago)****[233]***Discussant*

Richards, Michael [252] see Colleter, Rozenn

Richards, Michael [29] see Martinoia Zamolo, Valentina

Richards, Michael [29] see Scott, Michael

Richards, Michael [29] see Tarrant, Damon

**Richards-Rissetto, Heather (University of Nebraska, Lincoln) and Amy Thompson (University of Texas, Austin)****[165]***Subsistence in the Peripheries: Modeling Ancient Maya Milpa Cycles in Western Honduras and Southern Belize*

Ancient Maya agricultural practices varied based on heterogenous landscapes across the Maya Lowlands. While such variations may cause hesitation in comparative models, we find utility in assessing such differences to understand dynamic past human behaviors. Following the methods presented by Horn and Tran, we contribute to the session by comparing milpa cycles and food production from three Classic Maya centers in two discrete peripheral regions of the southern Maya lowlands: western Honduras and southern Belize, which have high-resolution lidar-derived DEMs and robust settlement data. Copán is situated in the highlands of western Honduras and Uxbenká and Ix Kuku'il are in the Toledo uplands of southern Belize. At Copán, we assess milpa cycles across 26 km<sup>2</sup> and more than 600 household plazuelas. At Uxbenká and Ix Kuku'il, we evaluate milpa cycles across 132 km<sup>2</sup> and more than 300 plazuelas. Using remote sensing, GIS modeling, and traditional ecological knowledge (TEK), we quantify suitable land for food production and compare that to population estimates for each ancient community. Our study contributes to the diversity in subsistence practices such as milpa farming in varied landscapes as part of the larger session on food production and land use among the ancient Maya.

Richards-Rissetto, Heather [249] see Wood, Richard

**Richter, Kristine (Harvard University), Roshan Paladugu (Universidade de Évora, Portugal), Cleia Detry (Universidade de Lisboa, Portugal), Cristina Barrocas Dias (Universidade de Évora, Portugal) and Christina Warinner (Harvard University)****[118]***Your Horse Is a Donkey! Identifying Domesticated Equids Using ZooMS*

Horses (*Equus caballus*) and donkeys (*Equus asinus*) play essential roles in human culture and economy. Unlike most other domesticates, horses and donkeys can produce hybrids. Mules, offspring of female horses and male donkeys, have been found in archaeological contexts across the Old World. Written sources describe the choice of horse, donkey, or mule as being often task-dependent. Romans preferred horses for riding, donkeys for endurance, such as pulling loads and ploughing, and mules for transporting civilian and military goods. After the end of the Roman period, equids became influential in Europe, especially for agricultural uses. Written records again suggest donkeys and mules were often preferred over horses. Despite the plethora of literary evidence, skeletal remains attributed to species remain scarce because current morphological studies are limited to reliably identifying only cranial and dental elements to species. While ancient DNA is the identification standard for equids, it is often cost-prohibitive and highly dependent on preservation conditions. Zooarchaeology by mass spectrometry (ZooMS) can provide a cost-effective alternative for taxonomic identification. However, ZooMS markers could not distinguish between the equid species. Here we present a multi-enzyme ZooMS approach to distinguish between horses and donkeys and characterize the profiles of their hybrid, mules.

Richter, Kristine [29] see Khachemoune, Nour

Rick, Torben [71] see Bruck, Seth

Ricketts, Brittany [162] see Slovak, Nicole

**Ridge, William (University of Illinois, Chicago)**

**[224]**

*Every Year Is Getting Shorter, Never Seem to Find the Time: Evidence for a Fourth-Millennium Gap in Southeastern Europe*

Prior to the surge in radiocarbon dating over the last 15 years, the culture chronologies of Southeastern Europe were organized neatly in sequential centuries-long blocks for the fifth and fourth millennia. Recent research, however, has completely upended the traditional chronologies. With increased research and scholarship on the Copper Age / Chalcolithic / Eneolithic (ca. 4500–2700 BCE), the standard and generally accepted prehistoric narratives have had to be retooled entirely. This includes the relationships between cultural groups, the pacing of technological developments (e.g., metallurgy), and the patterns of demographic change. One of the most striking developments is the scarcity of archaeological data from the first half of the fourth millennium. This period is generally positioned between the disappearance of the tells and large regional centers and the appearance of the Late Copper Age and Early Bronze Age cultures (e.g., Baden, Yamnaya, Sitagroi IV, Ezero). There appears to be a demographic decline throughout much of Southeastern Europe that may be tied to climate change, social upheaval, and large-scale migration. In this paper, I examine the corpus of radiocarbon data along with regional settlement patterns to try and answer a straightforward question: Was there a fourth-millennium gap?

Riebe, Danielle [121] see Nuccio, Victoria

Riede, Felix [96] see Jackson, Rowan

Riehm, Grace [95] see Kassabaum, Megan

**Riel-Salvatore, Julien (Université de Montréal)****[87]***Discussant***[87]***Chair***Riel-Salvatore, Julien (Université de Montréal), Fabio Negrino (Università di Genova) and Claudine Gravel-Miguel (Arizona State University; Université de Montréal)****[87]***Where Do We Go from Here? A Review of Prehistoric Forager Mobility in Liguria*

Due to a suite of topographical and geomorphological factors, Liguria, and the Liguro-Provençal arc more generally, is an interesting natural laboratory in which to revisit some of the debates about forager mobility and its analysis that have unfolded over the past several decades. This paper presents an overview of how mobility has been tackled by prehistoric archaeologists in the region, focusing particularly on lithic technological organization and raw material provenance studies amplified by other more recent methodological developments. Drawing on case studies from the Balzi Rossi, Arene Candide, and Arma Veirana, it tracks shifts in mobility across the Middle and Upper Paleolithic in the region, situates them in broader debates about forager mobility, and highlights both interesting patterns that have emerged over time and open questions that should be the focus of research in coming years.

Riel-Salvatore, Julien [87] see Gazzo, Silvia

Riel-Salvatore, Julien [87] see Gravel-Miguel, Claudine

Riel-Salvatore, Julien [218] see Pothier-Bouchard, Geneviève

Riel-Salvatore, Julien [87] see Rellini, Ivano

Riera-Soto, Camila [59] see Uribe, Mauricio

**Rieth, Christina (New York State Museum)****[147]***The Archaeology of Schoharie Creek III Site, Schoharie County, New York*

The Schoharie Creek III Site is located in the town of Schoharie, Schoharie County, New York. The site was occupied by the Chantry and Almira Coons household. Their son inherited the property along with his wife Celina. Over time, the house was expanded to become a larger house with a small barn, several privies, and an icehouse. Surrounding the site were the activities of the household. Included were several domestic artifacts (whiteware, ironstone, redware, and yellowware), children's toys, architectural materials (nails, window glass, brick fragments), materials used in farming, and household debris. Around 1930, a fire started in the south end of the house causing most of the remains to be destroyed. When compared with other sites nearby, we can better understand how these groups lived in the town and how the site compares with other residences in Schoharie Valley.

**Rieth, Timothy (IARII)****[207]***Chair***Rieth, Timothy (IARII), Robert DiNapoli (Binghamton University), Carl Lipo (Binghamton University) and Terry Hunt (University of Arizona)****[207]***Bayesian Chronological Modeling Parameters for Establishing Initial East Polynesian Colonization*

Tom Dye was an early adopter and advocate for the application of Bayesian chronological modeling in Pacific archaeology. Since the 1990s, this chronology-building method has advanced our understanding of key

cultural and demographic events through improved and diverse software options, better integration of field data, and more sophisticated modeling structures. Here, we consider the issues of model and data structures to expand on Tom's pioneering analyses of initial colonization in East Polynesia. Using a series of simulated datasets with "known" colonization dates, we examine the effects of different data choices and OxCal modeling assumptions on the precision and accuracy of colonization estimates. Using these simulation results, we demonstrate the risks of using certain model parameters and suggest best practices for future Bayesian analyses. Our results offer actionable steps to improve estimates of initial island colonization in East Polynesia and beyond, which is important in its own right but is necessary for addressing many archaeological research problems.

Rieth, Timothy [207] see Morrison, Alex

Rieth, Timothy [207] see Tuggle, Myra Jean

**Riggs, Erin (University of Illinois, Urbana-Champaign)**

[217]

*Chair*

**Riggs, Erin (University of Illinois, Urbana-Champaign)**

[217]

*Negotiating the Centrality of Regional Identity in Real Time: Punjabi, Bengali, and NWFP-Ness among Partition Refugees in Delhi*

Archaeologists understand the limitations of viewing cultural categories as deterministic of material use and preference. Nonetheless, it is challenging to avoid such assumptions when trying to understand material patterns associated with moments of migration. This paper considers how regional identities shaped the ways refugees interacted with resettlement housing landscapes in Delhi (India) following the 1947 Partition of South Asia. Collating information from in-site survey, oral history interviews, and documentary records, I argue that refugees view their pre-Partition regional identities as a major orienting factor in how they have interacted with urban landscapes in the city. Punjabi refugees self-describe their resettlement spaces as modern and quick-changing. Bengali refugees highlight the green space and festival grounds in their communities. Refugees from the NWFP highlight their resilience in the face of coercive government planning. All view foregrounding such regional identities as means to counter the negative stereotypes associated with the broader identifier "refugee." This case study highlights how individuals can themselves contribute to assumptions about the determinism of cultural identities. Documenting varying opinions within communities and focusing on the materials that living people see as emblematic of cultural distinctiveness can facilitate understanding how perceived parameters of identity are negotiated on the ground.

Riley, Kurt [181] see Duwe, Samuel

**Riley, Tim (Prehistoric Museum @ USU Eastern)**

[246]

*Twisting through Time: Fremont Cordage and Modern Attempts at Replication*

Cordage was vital in the daily life of Fremont farmers across the Colorado Plateau. Yet, this humble technology rarely receives the full attention of textile specialists, focused on the intricate half-rod and bundle coiled parching trays, yucca sandals, and other more impressive aspects of the perishable fiber record. This talk examines a variety of fiber cordage artifacts recovered from Fremont contexts across eastern Utah as well as attempts to replicate this basic technology. Many of these items, including snares, bowstrings, sandal ties, bundles of unprocessed fiber, and nets, were collected without regard to context or provenience. This current study attempts to overcome these disadvantages by providing temporal context via direct radiocarbon dates, microscopic analysis of botanical components, and actualistic experiments in replication. This approach can discern patterns of time, material usage, and technological methods across the thousands

of cordage fragments and cordage-derived artifacts found in museums across the Colorado Plateau. While context and associations may be lost due to indiscriminate and unethical collecting practices, this approach can add value to collections that were previously considered outside of serious scientific inquiry.

Riley, Tim [198] see Cheney, Chelsea

**Rincon Mautner, Carlos**

[81]

*The Cave and the Cross: Agricultural Subsistence, Rainfall Prediction, and Ritual in the Sixteenth-Century Mixteca-Puebla Region*

The inhabitants across the Northern Mixteca and the drier sectors of the Tehuacan Valley developed technological innovations to counter the effects of recurrent drought on subsistence. Among measures implemented to conserve soil and water there are terraces, dams, reservoirs, and canals, as well as seed selection and cultivation techniques adopted from trial and error to optimize capturing and retaining soil moisture. Overlying these mundane tasks was a religious subsystem rich in symbolism that inspired the organization of farmers into a labor force that modified the landscape with supporting infrastructure. Under the guidance of ritual specialists, who encouraged collective participation in petitioning the personified forces of nature associated with sustenance, communities survived. Ritual activity was synchronized with the agricultural cycle. Communicating with the sacred sphere through ritual practice was aimed at generating bountiful harvests. This presentation focuses on the ability to predict the quality of the rainy season by studying ritual activity in the period prior to its beginning and the return of rainfall following the annual mid-summer drought drawing from prehispanic and colonial period examples.

**Rinehart, Niels (Vermont Department of Forests, Parks and Recreation)**

[18]

*Walking a Trail Like Reading a Book*

Histories are typically drawn up linearly, with events laid out in chronological order and often separated into periods of Early, Middle, and Late to illustrate the processes that make one event lead to another. But when you walk through your hometown, the landscape is a text written with the stories of one's life, and walking through that landscape, one organizes the stories spatially and not chronologically. The trails that run through the parks we manage present an opportunity to arrange the telling of the past as though reading the landscape as a text, thereby organizing the history and archaeology of that landscape spatially and not chronologically. Drawing from the work of Keith Basso and others, this paper explores how we might create trail guides that take visitors through a landscape of stories and names. Once a visitor can name the land and tell stories about it, they will begin to form a more intimate relationship with that landscape.

Ringle, William [93] see Bey, George

**Rios Allier, Jorge (Indiana University)**

[192]

*The Usefulness of Institutional Analysis (IAD) for Defining Focal Action Situations in Mexican Cultural Heritage: PROCEDE-INAH and CONACULTA Outcomes after 1992 Reforms*

This paper analyzes how polycentricity governance is articulated around cultural heritage (CH) performance in an overview of changing contextual factors and focal action situation in Mexican Cultural System (MCS). This paper adds to conversation historical analysis from law changes across time in both countries, and also uses the Network of Adjacent Action Situation Analysis (NAAS) and Combined IAD-SES (CIS) framework to structure and compare institutional analysis. Polycentric governance of cultural heritage is a scarce observed phenomenon in the development of cultural resource management policies. Three case studies are presented briefly here under the understanding of Institutional Analysis (IAD): PROCEDE-INAH, CONACULTA and

San Pablo Villa de Mitla. The polycentric approach is clearly defined in Elinor Ostrom's work and can be used as an opportunity to bridge Economics and Archaeology discussions about local management of cultural heritage. This opens an important discussion where CH, which should be considered as common resource, is used and owned by a given social group that identifies this cultural resource as its own heritage.

Rissolo, Dominique [81] see Moyes, Holley

Rist, Riley [211] see Hoag, Elizabeth

**Ritchey, Melissa (Washington University, St. Louis)**

**[252]**

*The Influence of Pastoral Cultivation Strategies and Novel Cuisines on Newly Introduced Crops in Central Asia during the Bronze and Iron Ages*

When crops are spread into new landscapes, communities, and their associated subsistence practices and culinary preferences, the crops undergo substantial selective pressure. This pressure can come in the form of new environmental constraints, such as a different growing season, or cultural pressure from differences in preferred taste, productivity, or cooking style. Recent research recognizes deep-seated culinary traditions on either side of the Eurasia landmass and the role these may have played in shaping cereal grains such as wheat, barley, and millet as they spread across the landmass between the third and first millennium BC. In addition to cuisines, growing conditions such as watering and manuring (identified through stable isotope analysis of archaeological grains) impact the size and productivity of cereal crops. This paper investigates the relationship between novel cuisines and cultivation practices on cereal grain size as the domesticates were first introduced by pastoralist communities in Central Asia between the third and first millennium BC through a metric analysis of grain size and  $\delta^{13}\text{C}$  and  $\delta^{15}\text{N}$  stable isotope values.

**Ritchison, Brandon (University of Illinois, Urbana-Champaign), Maureen Meyers (New South Associates Inc.) and Zoe Doubles (University of Illinois, Urbana-Champaign)**

**[217]**

*Rethinking Mississippian Migration and Frontier Settlement in Southwest Virginia, USA*

Fifteen years of excavations at the Carter Robinson mound site in southwestern Virginia, USA, have documented a case of immigration, settlement, and transformation at the extreme edge of the Mississippian world. Recovered cultural material suggests residents were nonlocal Mississippians who established intensive craft production economies supporting the trade of fibers and drilled objects. Hybridity in material culture attributes suggests the occurrence of intermarriage between Mississippians and locals. New excavations at the nearby Ely Mound in 2019 have identified an earlier occupation than expected, suggesting that the establishment of Mississippian groups in this region was multifaceted and involved reciprocal social and economic relationships. This paper will present these new data and suggest alternate understandings of expansion and settlement of Mississippian groups along their cultural frontier.

Ritter, Alexandra [71] see Baxley, Aleta

Rivals, Florent [218] see Martínez-Polanco, María

Rivera, Felipe [135] see Flores-Fernandez, Carola

**Rivera I., Arturo and Sarah Baitzel (Washington University in Saint Louis, Missouri)****[28]***Bag-Loading Tradition for Building Precincts in Los Batanes, Sama, Peru*

The use of shicras—Quechua for plant fiber net-bags made to contain and carry building materials/construction fill—has being traced to the Archaic period on the Central and North Coast of Peru. These bags contained rocks and other materials to prevent the collapse of wall foundations and to prevent collapse during earthquakes. However, there are no studies on the southern Andean coast (Tacna) about the use of bags for construction after the Archaic period. During the Middle Horizon the most commonly known building materials identified on the coast are adobe, quincha, and stones (cobble stones) and stones and mortar in the highlands. Recent excavations of architectural complexes at the site of Los Batanes (eleventh century CE) (Sama Valley, Tacna, Peru) identified double-faced cobble-stone wall features in advanced stages of collapse. We recovered textile fragments made of animal fiber and reeds mixed up with animal bones, shells, plants (chili peppers and others), wood. The relationship between textiles, fill, and stones suggests that textiles were used to hold fill and stones in place. We therefore propose that “bag-loading” used in houses presents a previously unidentified construction technique that echoes the antiseismic qualities of shicras.

Rivera I., Arturo [26] see Baitzel, Sarah

Rivera I., Arturo [29] see Diaz, Lucia

Rivera I., Arturo [70] see Zhu, Ruoyu

**Rivera Prince, Jordi (University of Florida)****[92]***Creating a Fisher’s Body: Using Ethnobiaarchaeology to Reveal the Caballito de Totoro-Body-Fish-Sea Assemblage in Ancient Huanchaco, Peru*

On the North Coast of Peru, archaeological evidence suggests artisanal fishers have used *caballito de totora* (reed) boats for over 3,000 years. In the modern-day fishing and surfing town of Huanchaco in the Moche Valley, these crescent-shaped boats are still used daily for gathering fish—a practice deeply embedded in the community. Excavations in Huanchaco at the La Iglesia Site by the Programa Arqueológico Huanchaco (PAHUAN) identified a late Early Horizon (ca. 400–200 BCE) cemetery of a small-scale fishing community. Bioarchaeological analyses identified a pattern of enthesopathies for particular individuals that correlated with expected stress markers from observations of modern-day artisanal fishers in Huanchaco. These observations are detailed to show how *caballito de totora* use can cause irreversible skeletal changes. The body, the *caballito de totora*, marine resources, and sea are all part of an assemblage. Following the framework detailed by Delsol (2019), I draw on Lefebvre’s “social spaces” (1991) and Ingold’s (2001) “skill” to illustrate how the *caballito de totora* shaped, and was shaped by, the fisher’s body in the practice of fishing in the sea—creating a “fisher’s body” qualitatively different from the bodies of the rest of the community. This presentation has photos of human remains.

**Rivera-Collazo, Isabel (University of California, San Diego)****[157]***Discussant***Rivera-Collazo, Isabel (University of California, San Diego)****[16]***“Temporal, temporal, allá viene el temporal”: Memory, Disaster, and Change in Puerto Rico*

As one of the oldest colonies in the world, Puerto Rico has developed diverse strategies to transfer knowledge about disasters and to stimulate community ties for social resilience. The impact of disasters and the memory of response are present in intangible heritage. An example of this is the song “Temporal” describing how to read the landscape for predicting the threat of a storm, the fear and anxiety linked to living through it, and the hope and uncertainty that comes after the storm has passed. This richness of knowledge can be a source of empowerment and resilience, but rapid change in multiple dimensions—landscapes, climate, biodiversity—complicate response. One first step for climate adaptation is the identification of

hazards and risks. However, risks are culturally defined. Acceptable responses are codified in intangible knowledge within cultural identities. Therefore, the past is an important resource in both perception of risk and the identification of solutions. In this presentation, we look at the archaeological record of the impact of storms and coastal erosion in Borikén, the largest island of the Archipelago of Puerto Rico, and consider how risk perception, memory, and knowledge transfer could be identified in the archaeological record.

Rivero, Santino [26] see Carballo, David

**Rivero Weber, Lilia (Mtra. Investigadora) and Nelly Robles García (Centro INAH Oaxaca) [91]**

*Conservación de la pintura mural de una tumba Zapoteca de la Sierra Norte de Oaxaca*

Enclavado en la entrada de la región de la Sierra de Juárez, Oaxaca, San Pedro Nexicho es una comunidad zapoteca asentada sobre los vestigios arqueológicos de un sitio que data de la época Clásica y Posclásica, en cuya época más tardía constituyó el Señorío de Ixtepeji. A partir del año 2015 la fundación Alfredo Harp Helú se interesó en el rescate de las tumbas prehispánicas que se encuentran en diversas terrazas, por lo que colaboramos en su rescate y conservación. La Tumba I en la Terraza 41, constituyó un reto para su exploración y restauración, dado que había sido saqueada, los contextos fueron alterados y desafortunadamente la pintura mural fue objeto de destrucción y vandalismo. El trabajo que se presenta ofrece un recuento de las excavaciones arqueológicas, los procesos de documentación, las tareas de restauración arquitectónica y los arduos trabajos de restauración de la pintura mural.

Rizzuto, Branden [139] see Giersz, Milosz

Rizzuto, Branden [126] see Holyoke, Kenneth

**Roa, Ian (University of Pittsburgh), Ashley Sharpe (Smithsonian Tropical Research Institute), Claire Ebert (University of Pittsburgh) and Julie Hoggarth (Baylor University) [45]**

*<sup>86</sup>Sr/<sup>87</sup>Sr Evidence for the Role of Animals in Ritual Economies among the Ancient Maya in the Belize River Valley*

Traditional zooarchaeological methods studying trade rely on the identification of animals found outside their natural habitat ranges. More recently, strontium isotope (<sup>86</sup>Sr/<sup>87</sup>Sr) analyses have proven to be a powerful tool for studying the movement of animals found in archaeological contexts. Strontium isotopic evidence from the Maya lowlands has documented the movement of common species, including deer and dog, over long distances, suggesting they were not always local to their burial location. This study identifies possible animal exchange patterns among ancient Maya communities in western Belize, focusing on animals from the ritual contexts that were often the target of long-distance trade. A total of 27 teeth from five species, ranging from peccary to dog, were sampled from ritual contexts at urban centers in the Belize River Valley spanning from the Middle Preclassic (900–300 BC) to the Terminal Classic (AD 750–900/1000). Contexts include special deposits, burials, and caches. Zooarchaeological analyses of assemblages from these sites previously identified differential distribution patterns of animals despite being in similar ecological zones. The results of this study provide a foundation to document animal trade between sites and from other regions and to address hypotheses about whether these animals were imported for ceremonial purposes.

Roache-Fedchenko, Amy [167] see Lowe, Lexie

**Roberts, Jerod (Texas State University) [241]**

*Assessing the Variability and Chronology of Red Linear Style Pictographs of the Lower Pecos Canyonlands of Texas: Final Results*

This paper aims to further define the characteristics of Red Linear style (RLS) anthropomorphs and establish its temporal relationship with other regional rock art styles of the Lower Pecos Canyonlands of Texas and

Coahuila, Mexico. In 2013, Boyd et al. presented a list of diagnostic attributes for the RLS based on 444 figures across 12 sites. In addition, their study identified 38 RLS figures under Pecos River style (PRS), relatively dating RLS as older than or contemporaneous with PRS. This paper expands upon Boyd et al.'s dataset to include anthropomorphic attributes from an additional 20 RLS sites and establish a comprehensive list of RLS diagnostic attributes. This expanded dataset confirms that the figures under PRS display attributes unique to RLS. To establish RLS pictographs in a temporal context using absolute dating methods, I selected five anthropomorphs depicting clear diagnostic RLS attributes for AMS dating. The radiocarbon ages from the five Red Linear figures range from 4276 to 4830 RCYBP, placing production of the style to the Early Middle Archaic period. Therefore, contemporaneous with the oldest known dates for the PRS. These absolute dating methods support Boyd et al.'s and place Red Linear temporally along other aspects of the archaeological record.

Roberts, Jerod [112] see Rhoads, Tyler  
 Roberts, Jerod [112] see Roberts, Victoria

Roberts, Patrick [68] see Hixon, Sean

**Roberts, Theodore (PaleoWest)**  
**[120]**  
*Discussant*

Roberts, Tim [45] see Smith, Micah

**Roberts, Victoria (Texas State University; Terracon), Kaylee Henderson (Texas State University) and Jerod Roberts (Texas State University)**  
**[112]**

*A Study of Incised Designs within a Wari D-Shaped Temple Complex*

With the discovery of a Wari D-Shaped temple and other adjacent architectural structures in 2019, the 2022 field season at Huaca del Loro focused on excavation of the temple complex. Well preserved mud plaster still remained on many of the walls and floors of the structures. Examination of the walls in the temple and surrounding structures revealed incised designs. In total we identified at least seven quadrupedal zoomorphic figures and many other sets of deeply incised lines. This paper seeks to further investigate and describe the attributes of these unusual zoomorphic figures. By comparing the incised imagery to iconography of both the Nasca and Wari cultures, we hope to provide evidence of coastal and highland interactions.

Roberts, Victoria [112] see Rhoads, Tyler  
 Roberts, Victoria [181] see Wilson, Katherine

**Roberts Thompson, Amanda (University of Georgia)**  
**[32]**  
*Discussant*

Roberts Thompson, Amanda [74] see Holland-Lulewicz, Jacob

Robertson, Mike [127] see Evaschuk, Dana  
 Robertson, Mike [205] see Watson, Keli

**Robin, Cynthia (Northwestern University)****[110]***Discussant***[243]***Chair***Robin, Cynthia (Northwestern University)****[243]***Aventura: An Introduction*

Urban households anchor the first decade of research at the Maya site of Aventura, Belize, situating the daily lives of the city's heterogeneous residents. They also illuminate social, political, economic, and environmental factors that enhanced life in the community. Summarizing research results of the Aventura Archaeology Project from 2014 to 2023, I begin with an overview of the Classic period city, couched within Aventura's broader 5,000-year history. I highlight previous research, key theoretical frameworks, and methodologies that enable and crosscut the research of project members. This research has been a collaborative effort from its inception. In developing the Aventura Archaeology Project, we drew on the previous research of Raymond Sidrys (1974, UCLA) and the Belize Institute of Archaeology (2007), as well as conversations with local cultural heritage leaders and community members. Our research is animated by the themes: household, community, landscape, city, longevity, and the entwined nature of studying ancient communities and collaboration with contemporary communities. Our methodology of bringing together a study of urban households and an analytical focus on multiple lines of evidence affords a deeper understanding of both daily life and the organization and operation of the city.

Robin, Cynthia [243] see Batty, Sylvia

Robin, Cynthia [243] see Fitzgerald, Kat

Robin, Cynthia [243] see Hoover, Hannah

**Robinson, Charlotte (University of Central Florida), Neil Duncan (University of Central Florida) and John Walker (University of Central Florida)****[25]***Palisades, Ponds, and House Gardens: Phytolith Analysis on the Functionality and Importance of a Ring Ditch in Llanos de Mojos, Southwestern Amazonia*

In southwestern Amazonia, the seasonally flooding, anthropogenic landscapes of Llanos de Mojos may be associated with the domestication of several important crops such as manioc (*Manihot esculenta*), peanuts (*Arachis* spp.), peach palm (*Bactris gasipaes*), and chili pepper (*Capsicum baccatum*). These landscapes, which increased the productivity of the environment through the investment of human labor, consist of unique patterns of earthworks, including raised fields, causeways, canals, fish weirs, and ring ditches. The relationships between these features and the exact roles they may have played for past inhabitants, however, are not well known. Ring ditches in particular have been debated as serving defensive and hydraulic functions for local communities, given the way they encircle village sites. More recent research reveals their possible connection to the cultivation of house gardens with fertile soils. Here we show the results of phytolith analysis on a sediment core, which was sampled from one of these features during the excavation of the forest island Santa Maria in 2018 in order to interpret the function and importance of the ring ditch surrounding the settlement.

Robinson, Erick [137] see Baxter, Erin

Robinson, Erick [198] see Cheney, Chelsea

Robinson, Erick [88] see Conti, Alberto

Robinson, Erick [198] see Finley, Judson

Robinson, Erick [198] see Harvey, David

Robinson, Erick [94] see Hoffman, Matthew

Robinson, Erick [170] see Kelly, Robert  
 Robinson, Erick [89] see Shield Chief Gover, Carlton  
 Robinson, Erick [198] see Wolberg, Alexandra

Robinson, Mark [20] see Maezumi, S. Yoshi

Robion-Brunner, Caroline [166] see Herve, Gwenael

**Robles García, Nelly (Instituto Nacional de Antropología e Historia)**

[91]

*Discussant*

Robles García, Nelly [91] see Rivero Weber, Lilia

**Robles Montes, Mayra, Enrique Nava-Sánchez and Guillermo Martínez-Flores (CICIMAR-IPN)**

[197]

*Paleoshoreline Reconstruction: A First Approximation to Submerged Prehistoric Landscapes of Isla Espiritu Santo, Mexico*

Ancient coastline modeling is an effective method for reconstructing submerged prehistoric landscapes, allowing us to understand the human use of the coastal zone through time. Here we present data from Espiritu Santo Island, one of the oldest human settlement areas in the Baja California Peninsula. This study aims to reconstruct the paleoshoreline between 12,500 and 8000 cal BP for archaeological prospection. We use Yao's model to project ancient coastlines onto a digital-elevation model based on relative sea-level data, incorporating local sediment deposition. The results are projected at 500-year intervals in RStudio and consistent with the prediction of the sea-level rise. The reconstruction shows that between 12,500 and 9000 cal BP, a tombolo linked Espiritu Santo to the mainland. At 10,500 cal BP, an islet was formed off the southern tip of Espiritu Santo. Between 10,000 and 9000 cal BP, an islet in front of Punta Prieta became submerged. At 8500 cal BP, the island separates from the mainland. Finally, at 8000 cal BP, the coastline is located at the approximate limit of the current pocket bays. Reconstructing paleotopography features extends our knowledge about coastal environments in Baja California's past and offers insight on where to search for potential submerged sites.

**Roche Recinos, Alejandra (Reed College)**

[172]

*Regional Patterns in Lithic Procurement and Production in the Middle Usumacinta*

The Middle Usumacinta River was a politically fragmented and contested region during the Classic Maya period, with neighboring polities vying for territory, prestige, and wealth. Recent archaeological and epigraphic work is continuing to delineate the shifting borders and alliances of this time period, with the goal of understanding the complex sociopolitical relationships and mechanisms through which certain polities came to dominate others. Within such studies, a persistent question has concerned the economic consequences of living in such a politically and militarily contested area. Did political boundaries limit the flow of goods and raw materials? Did borders lead to the emergence of different technologies or traditions of production? Could residents of one polity access goods from a rival's, in some cases only a few dozen kilometers away? To address these questions, this paper presents the results of lithic analysis of stone goods from the sites of Piedras Negras, Yaxchilan, Lacanja-Tzeltal, and Palenque. I analyze these goods in respect to where raw materials are coming from, the production technologies used in crafting, and kinds of goods produced. In doing so, I find distinct differences between each site that I argue reflect fragmentation of the region's economic networks along political lines.

Rochon, Jaron [181] see Moriarty, Ellen

**Rockman, Marcy (Lifting Rocks LLC; University of Maryland)**

[96]

*Chair*

**Rockman, Marcy (Lifting Rocks LLC; University of Maryland)**

[96]

*Climate Change Has a History and Landscape Learning Is One of Its Storytellers*

Development of the landscape learning model began more than 20 years ago as part of my work to find ways to use the past to help address modern environmental problems. Combining initial work with nineteenth-century gold rush miners in Wyoming with models of Paleoindian colonization and assemblages led to the hypothesis that all people encountering unfamiliar environments are challenged to learn them and that how they do so can, in at least some cases, be seen and studied archaeologically. Since then, landscape learning has been tested and further developed across a range of times and places—together showing that landscape learning is a path to equity, in that every place that is or has been a home to people has held pathways of environmental learning, and that modern anthropogenic climate change is both shaped by landscape learning in the past and is and will continue to demand more learning from us as we identify climate impacts and face climate adaptation, migration, and mitigation. Drawing particularly from the history and archaeology of the historical settlement of Jamestown, this paper brings together the past and future of the archaeology of landscape learning with climate change science and policy.

**Rockwell, Heather (Salve Regina University)**

[88]

*Large Interpretations from Small Things: The Potential and Need for Large-Scale Microwear Studies*

Since its broad application in the 1980s, a core critique of microwear analysis of lithic tools in North America has been its examination of very small sample sizes. This has often relegated microwear to the fringes of prehistoric studies—a curiosity, or an anecdote that does not add true substance to site interpretations. While our European colleagues view microwear as an essential step in understanding and interpreting human behavior within an archaeological context, archaeologists in North America continue to rely on macrolithic analysis, and interpretations of site use based on tool morphology alone, which has been long demonstrated to be an unreliable method or understanding tool use. However, microwear studies continue to be viewed with suspicion by most North American Archaeologists, despite the widespread use and publication of blind testing to demonstrate mastery. I argue that this limits the amount of microwear completed, as projects are only willing to devote a small amount of funding to what they view as producing results of limited utility. To maximize the power this methodological technique can offer it is essential that analysts look at large collections. By creating large datasets of microwear results we will have a more complete view of the past.

**Roddick, Andrew (McMaster University)**

[16]

*Discussant*

[233]

*Chair*

**Roddick, Andrew (McMaster University) and M. Elizabeth Grávalos (Field Museum)**

[233]

*Political Geologies Past and Present: An Introduction*

Researchers working across the humanities and social sciences have recently demonstrated how the study of earthy materials is rooted in historically and ontologically specific frameworks. Such frameworks are, as Bobbette and Donovan (2019) demonstrate, “political geologies.” Geological practices are inherently political because of how practitioners identify, select, frame, and even exclude certain materials. These ongoing

interdisciplinary conversations impact archaeological practice as well as interpretations of geomaterials, particularly with regard to evaluating political relationships. Simultaneously, archaeologists are reevaluating how to examine the political, with critical perspectives toward the normative political economy models that are the foundations for many considerations of so-called “raw materials.” In this introductory paper, we discuss salient links between these two bodies of literature to problematize the political from the geological ground up. We also touch on some of the broader themes of this session: explorations of the political in geoarchaeology, reevaluations of uncritical approaches to earthly materials, and juxtapositions of scientific and Indigenous ontologies in archaeological practice. We suggest that archaeologists must be part of interdisciplinary conversations in political geology, since our methods and theories are rooted in categorizations and understandings of geomaterials.

Roddick, Andrew [181] see Chakraborty, Kalyan Sekhar

Roddick, Andrew [164] see Smith, Scott

Rodriguez, Patricia [200] see Pelaez-Ballestas, Ingris

**Rodríguez-Delgado, Eric (UC San Diego) and Mariela Decllet-Perez (UC San Diego)**  
[96]

*Transplanted at the Coast: The Adaptation of Caribbean Resourcing Practices during the Late Holocene*

The movement of early agriculturalists from the South American continent during the Early and Late Ceramic Ages (500 BCE–1500 CE) marked a significant transformation of the cultural landscapes of the Caribbean archipelago. These arriving groups expressed a strong cultural identity in their ceramic materials, settlement patterns, mixed subsistence strategies, and intra- and interisland exchange networks. These migrations coincided with the changing environmental and climatic contexts of the Late Holocene where shifting depositional contexts, wetter conditions, and more frequent and intense storms impacted areas preferable for traditional settlement and food resourcing. In the midst of these changing and unfamiliar environments, how did these groups adapt and/or continue to emulate cultural practices in the colonization processes of the Caribbean? Focusing on recent zooarchaeological and geoarchaeological analyses of Tierra Nuevas, a continuously inhabited Ceramic Age site located on the northern coast of Puerto Rico, this paper draws from the landscape learning framework to examine how the changing climate of the period challenged the production and reproduction of locational and limitational landscape knowledge. We then use the Transplanted Knowledge framework, a novel conceptual synthesis, to assess how traditional resourcing practices were adapted or emulated in these changing climatic contexts.

**Rodríguez-Rodríguez, Karla (Centro INAH-Michoacán), Fernanda Navarro Sandoval (Centro INAH-Michoacán), Mónica Sosa-Ruíz (Centro INAH-Michoacán), José Ortega-Ramírez (INAH) and José Luis Punzo Díaz (Centro INAH-Michoacán)**

[200]

*Divine Food and the Warriors of Curicaueri*

In the Tarascan cosmovision, feeding the gods daily, especially Curicaueri, was vital because it ensured that the world would continue to function; this food was the human sacrifice. At the foot of the platform, one of the most significant pieces of evidence of this act of surrender to the gods was found, where an enormous number of human bones were recovered. These were part of the structural base of an important political-religious precinct, dating from the Late Postclassic period, during the apogee of the Tarascan Lordship. Therefore, this research seeks to know the number of individuals that were part of the osteological collection of the Tzintzuntzan Ossuary found at the Great Platform, on the northeast side. The accounting will be carried out by the implementation of geophysical studies and different methods of numerical estimation from physical anthropology, bioarchaeology, and mechanics of materials.

Rodríguez-Rodríguez, Karla [200] see Pelaez-Ballestas, Ingris

Rodriguez Yabar, Alexis [22] see Bergmann, Christine

**Roedel, Kurt**

[194]

*Discussant*

**Rogers, Alexander (Maturango Museum [retired]) and Robert Yohe II (California State University, Bakersfield)**

[21]

*Trends in Prehistoric Toolstone Use in the Upper Mojave Desert of Eastern California*

The upper Mojave Desert of eastern California is bounded by the transverse ranges on the south, the Sierra Nevada on the west, and the Great Basin on the east and north, and has been utilized by Native peoples since Paleoindian times. Occupation has varied through time due to population movements and resource variability, probably including climatic effects. Toolstone resources include extensive sources of obsidian and fine-grained volcanic along the Sierra Nevada front, plus widespread sources of cryptocrystalline silicates in the desert itself. We assembled a dataset of approximately 3,500 temporally sensitive projectile points from 537 sites in the region, and aggregated them in terms of eight subregions. These data are correlated with approximately 4,000 obsidian hydration dating (OHD) ages from 160 sites in the same subregions. We present data for each subregion, showing the total number of artifacts present, the variation of artifact count with time, correlation with OHD ages, and the material use trends with time. Which toolstone resources were utilized at any site was probably conditioned by availability and accessibility, including transport costs. Finally we comment on issues arising from using artifact counts to infer population in times of radical changes in hunting technology.

**Rojas, Jean-Paul, Benjamin Ramirez (University of Texas, Rio Grande Valley) and Mozelle Bowers (University of North Carolina, Charlotte)**

[237]

*The Environment and Landscape at Buen Suceso, Ecuador*

Buen Suceso, a Formative period Valdivia site, is located in the Culebra-Colin (Manglaralto) valley of Ecuador's coastal plain, on the lands of the contemporary comuna Dos Mangas, and flanked by the Chongón-Colonche Hills. The site is in a tropical rainforest ecoregion characterized by two primary seasons: the wet season with six months of continual *garúa*—or light rain and foggy conditions with minimal sun—and the summer season with increased sun and less frequent rainfall. In addition to forest resources, proximity to the Pacific ocean and marine resources also had demonstrated importance at the site. Through analysis of artifacts, the spatial organization of the site, and GIS multispectral imagery, we identify how landscape and environmental conditions affected those living in Buen Suceso. Moreover, we place Buen Suceso in connection to the wider Valdivia world through landscape and environmental comparison with other Valdivia sites such as San Pablo, Río Perdido, Loma Alta, and Real Alto.

Rojas, Jean-Paul [237] see Figueroa, Cristian

Rojas, Jean-Paul [237] see Gutierrez, Jonathan

Rojas Bergna, Angela Lucia [28] see Bak, Judyta

Rojas-Sepúlveda, Claudia [134] see Hall, Sarah

**Roman-Ramirez, Edwin (Proyecto Arqueologico del Sur de Tikal)****[236]***The Time the Tikal State Emerged*

During the first centuries of the CE, the Maya Lowlands underwent many changes in its political landscape, which were caused by the abandonment of the main Formative centers, including El Palmar, which was the most powerful center in the Buenavista Valley. Taking advantage of these compulsive times, Tikal begins to become the guiding center in this valley. However, it was not until the fourth century CE that the Mutal dynasty managed to establish itself as one of the strongest states in the region, after the event known as the Arrival of Foreigners in the year 378 CE. In this talk, the process of how Tikal became a hegemonic state will be discussed, where it is proposed that the main strategies used by its dynasty were wars, political alliances, and the creation of an extensive defensive system throughout its territory. For this, historical data, analysis of the built landscape and new archaeological data obtained in the southern sector of Tikal will be explored.

**Ronsairo, Karleen (George Washington University)****[86]***Long-Term Use of Local Clays in Potting Traditions during Early Urbanization in the Nochixtlán Valley of the Mixteca Alta, Oaxaca, Mexico, 500–100 BCE*

The Mixteca Alta Ceramic Study (MACS) in the Nochixtlán Valley of Oaxaca, Mexico, aims to understand how early urbanization in the valley impacted potters' crafting techniques over time and space. Early urbanization in the valley spanned the Yucuita and Early Ramos ceramic phases (500–100 BCE) of the Middle to Late Formative periods. Stylistic differences between Yucuita and Early Ramos pottery from two urban centers in the valley, Yucuita and Etlatongo, indicate that potters adapted their crafting techniques in surface finishes, vessel forms, and designs during this 400-year period of urbanization. For this study, petrography was performed on raw clay samples from the Nochixtlán Valley and on pottery samples from Yucuita and Etlatongo to gain more insight into potters' technological choices in the earlier production stages of clay procurement and paste preparation. The petrographic data coupled with geochemical data obtained from neutron activation analysis (NAA) show that potters procured the same local clays to craft different pottery styles and paste recipes throughout the Yucuita and Early Ramos ceramic phases. Potters' long-term use of local clays during this period shows that their technological choices in clay procurement and paste preparation persisted through time despite significant sociopolitical change and urbanization in the region.

Roque, Grecia [55] see Zimmer-Dauphinee, James

**Rorabaugh, Adam (Simon Fraser University; Washington State Department of Fish and Wildlife)****[92]***Seascapes of the Unreal: Using Agent-Based Modeling to Examine Traditional Coast Salish Maritime Mobility*

Nontraditional tools and mediums can provide unique methodological and interpretive opportunities for archaeologists. In this case, the Unreal Engine (UE), which is typically used for games and media, has provided a powerful tool for non-programmers to engage with 3D visualization and programming as never before. UE has a low cost of entry for researchers as it is free to download and has user-friendly "blueprint" tools that are visual and easily extendable. Traditional maritime mobility in the Salish Sea is examined using an agent-based model developed in blueprints. This simulation integrates lidar and bathymetric data from a GIS to assess travel distance costs between modeled Coast Salish village sites on shore and riverine contexts. The integration of these types of tools, traditionally used for entertainment, can increase the accessibility of modeling approaches to researchers, be expanded to digital storytelling, and can have wide applications beyond maritime archaeology.

**Rosado-Ramirez, Roberto (Northwestern University)****[242]***Chair***Rosado-Ramirez, Roberto (Northwestern University) and Arthur Joyce (University of Colorado, Boulder)****[242]***Introducing the Vibrancy of Ruins in Ancient Mesoamerica*

This paper introduces the session by discussing recent ideas advanced by ruination studies and the material turn, as well as the role of ruins in Mesoamerican communities. Combining concepts from ruination studies and the “New Materialist” perspective helps us to understand ancient communities as formed by assemblages of humans and nonhumans. In ancient Mesoamerica, ruins were not static backgrounds for human actions. Ruins, along with animals, substances, things, and landscapes, among other actors, were nonhuman agents that were critical in the emergence and resilience of communities. Such interpretation is rooted in Indigenous ways of knowing in Mesoamerica. This paper will also briefly discuss archaeological, historic, and ethnographic data to illustrate that Indigenous peoples considered ruins as dynamic constituents of communities in Mesoamerica long before the European invasions that started in the sixteenth century. This paper will provide background on and set the stage for the case studies that will be discussed in this session.

Rosario, Mikayla [8] see Haas, Randy

**Roscoe, Paul (University of Maine)****[24]***Discussant***Roscoe, Paul (University of Maine)****[142]***Capitalizing on GINI*

The CfAS's Inequality Project focuses on economic inequality, a feature of modern society that has attracted both increasing public concern and growing historical and social research because of its critical implications for individual, national, and global well-being. The Inequality Project's particular value is its global perspective on economic inequality and its reach into deep history. There are, however, as many forms of inequality as there are forms of capital, including social, cultural, ritual, military, and political inequality, arguably the most important inequality of all. In this presentation, I consider the degree to which economic inequality might correlate with the presence of other forms of inequality, in particular political inequality. To this end, I review the properties of different forms of capital—how easy they are to produce, their monopolizability, their capacity for transformation into other forms of capital, and their costs and benefits in coercing or inducing the behavior of others.

**Rose, Autumn (University of Florida), Kitty Emery (Florida Museum of Natural History) and Robert Guralnick (Florida Museum of Natural History)****[114]***Predators and Prey among the Ancient Maya: A GIS Approach to Understanding Archaeofauna and Past Environments*

Human-caused environmental changes and their effects on the Classic Maya continue to be topics of vital research importance. Zooarchaeological data can provide valuable inferences about ancient Maya environments but must be assessed with care. In the Maya area, habitat fidelity models use high predator abundances to indicate the local presence of the mature forest that many prefer. Foraging ecology, traditionally focused on food prey, suggests that high abundances of “non-preferred food prey” (which would include predators since most are not preferred as food) would instead be indicative of a disturbed ecosystem subject to high hunting pressure. In the ancient Maya world, however, predators were often very highly valued for other cultural

reasons, particularly as political symbols of wealth and power. Their abundance in Maya archaeological assemblages thus may represent either the local availability of their habitats or their value as a resource worth high effort including long-distance hunting forays, trade, or even captive rearing. We use GIS to map zooarchaeological data on terrestrial predators, preferred food prey, and preferred non-food prey alongside settlement data on population sizes and social and political complexity, and other non-faunal environmental reconstructions, to evaluate the utility of predator frequencies as environmental predictors.

**Rose, Chelsea (Southern Oregon University)**

[40]

*Discussant*

**Rose, Chelsea (Southern Oregon University) and Tiah Edmunson-Morton (Oregon State University)**

[7]

*We Can Brew It! Rethinking the Demographics of Early Oregon Breweries*

Largely assumed to consist of a male-dominated workforce and clientele, many early Oregon breweries were actually family affairs. The Eagle Brewery and Saloon, one of the first breweries in Oregon, was run by German immigrants Joseph and Fredericka Wetterer. They sold lager beer, distilled whisky and brandy, and had a small vineyard on their property. Upon Joseph's death in 1879, Fredericka owned and operated the brewery until she remarried in 1883. Fredericka was one of only 61 women who listed their occupation as "brewer" in the 1880 census. There were 16,217 men. Investigations into the Eagle Brewery reflect a dynamic time of German immigration to the United States and the resultant shift from ales to lagers that not only changed the style and flavor of beers in Oregon but also the equipment and infrastructure needed to manufacture them. In addition, family businesses such as this challenge the stereotypes of frontier alcohol production and consumption, and the role of women and children in what have traditionally been considered male spaces.

**Rosen, Arlene (University of Texas, Austin), Jennifer Farquhar (University of Pittsburgh) and Tserendagva Yadmaa (Institute of Archaeology, Mongolian Academy of Sciences)**

[54]

*Continuity and Change on the Gobi Frontier: Geoarchaeology of Human Adaptations to Desertification in Southern Mongolia*

The Northgrippian climatic stage of the mid-Holocene epoch in East Asia was marked by a period of pronounced warm/moist climatic conditions. This had a profound impact on the hydrology and vegetation in the northernmost region of the Gobi Desert located in southern Mongolia. Our geoarchaeological and archaeological fieldwork at the site of Burgasney Enger (Ikh-28/Ikh-9) within the Ikh Nart Nature Reserve, Dornogovi Province, Mongolia, showed that landscapes of this area were dotted with ponds, wetlands, perennial streams, and springs during the mid-Holocene. These water sources attracted highly diverse forms of flora and fauna that provided a rich resource base for the mobile hunter-gatherers who inhabited this region from ca. 6000–4000 BP. With the onset of general climatic cooling and drying in the late Holocene Meghalayan stage, desertification set in and human groups developed mobile herding economies. Despite these apparent economic differences in land use between the two stages, there was much continuity in the ways people used these desert landscapes. With a deep time perspective over the course of thousands of years, we identify continuity in traditions of land use that are likely rooted in long traditions of ecological knowledge.

**Rosen, Steven (Ben-Gurion University), Lior Schwimer (Israel Parks and Nature Preserves Authority), Roy Galili (Ben-Gurion University of the Negev), Naomi Porat (Israel Geological Survey) and Nadel Dani (Haifa University)**

[241]

*A Rock Art Depiction of a Desert Kite Hunting Drive Trap*

A recently discovered petroglyph panel in the Har Tzuriaz region of the southern Negev, Israel, depicts a typical desert kite, a form of drive trap used for millennia to hunt gazelle. The depiction closely approximates

an actual desert kite located less than a kilometer away, but not in direct line of sight. Such specific depictions are rare. OSL dating of sediments accumulated at the head of the kite, in the killing cell, date construction to the sixth millennium BCE, but relative dating of the petroglyph based on patina and superposition, and initial chemical dates based on magnesium and iron accumulation, indicates a Classical era date, thus reflecting a gap of roughly five millennia between the construction of the kite and the composition of the art. The discrepancy between the two reflects the cumulative nature of constructed landscape in the desert, as well as likely reuse and re-understanding of the desert kite in later periods.

Rosenburg, Dan [26] see Baitzel, Sarah

**Rosencrance, Richard (University of Nevada, Reno)**

**[89]**

*Chair*

**Rosencrance, Richard (University of Nevada, Reno)**

**[89]**

*Haskett Chronology and Its Relationship to Other North American Technocomplexes*

Haskett projectile points are well known in the Great Basin, but until recently their precise age has been considered poorly understood. Outside of the Great Basin, few researchers know of Haskett or consider it an important facet of the late Pleistocene cultural landscape. Archaeologists outside the Far West have recently used Bayesian chronological modeling to create high-resolution estimates for the beginnings, ends, durations, and overlap of times when people made Clovis and Folsom points. In this paper I take a similar approach to modeling the age of the Haskett technocomplex. I compile and evaluate existing radiocarbon dates at Haskett sites and obtain new dates from multiple components and sites, all of which is then modeled in a Bayesian framework. Finally, I compare my Haskett chronology with a compilation of other radiocarbon dated technocomplexes to provide a more encompassing picture of cultural and lithic diversity across North America during the Pleistocene. My model indicates Haskett is a Folsom contemporary and likely appeared during Clovis times. It is also the oldest of all shoulderless stemmed points in North America and may represent the antecedent to all other forms, as suggested by the age and geographic distribution of Haskett and other complexes.

Rosencrance, Richard [21] see Saper, Shelby

**Rosenstein, Dana Drake (University of Arizona)**

**[166]**

*A Short Historiography of David Killick*

David Killick came to archaeology perhaps earlier in life and almost surely in a more unconventional way than did most of us: at a prestigious, all-boys boarding school in what was then colonial Rhodesia. Student trips to the nearby Matobo Hills, an extraordinary landscape of balancing granite boulders that hide thousands of rock art sites, and camping excursions to Great Zimbabwe, where the imposing, mortarless stone walls of the thirteenth–sixteenth-century capital still stand, piqued Dave's curiosity about the ancient inhabitants of that landscape. Though he has collaborated on projects worldwide, Dave's lasting academic legacy is his research on the complexities of technology and trade in Southern Africa. In this short historiography, we will take a quick journey along Dave's path from his childhood in Malawi to his upcoming retirement from the University of Arizona.

Rosero, Paúl [57] see Astudillo, Fernando

**Roskamp, Hans (Colegio de Michoacán)**

[13]

*Chair***Roskamp, Hans (Colegio de Michoacán)**

[13]

*The Metallurgists from Jicalán in the Colonial Period: An Ethnohistorical Approach*

A thorough exploration of the available historical documents from the colonial period demonstrates that Jicalán was one of many prehispanic settlements inhabited by copper mining, smelting, and smithing specialists that managed to preserve their knowledge and skills until at least the beginning of the eighteenth century. This paper does not address the technological aspects of metalworking, nor its continuities and changes, dealt with by colleagues. Instead, it focuses on the broader identity of these copper workers and the settlement in general, especially in relation to the neighboring villages and the colonial authorities (both Indigenous and Spanish), to show their place in the regional political, religious, economic, and sociocultural systems.

Roskamp, Hans [13] see Corona, Néstor

**Rospopo, Steven (San Juan College Totah Archaeological Project), Linda Wheelbarger (San Juan College Totah Archaeological Project) and Nicholas Jew (San Juan College Totah Archaeological Project)**

[45]

*Middle San Juan Ancestral Puebloan Communities of Practice-Connections and Networking in the US Southwest*

Some Southwest researchers consider the Middle San Juan area insignificant when compared to the Cibola-Chaco traditional homelands to the south and the Mesa Verde traditional homelands to the North. On the contrary, ongoing research suggests a web of dynamic interregional and intraregional networks existed in the Middle San Juan from AD 750 to regional abandonment about AD 1300. Ceramic, lithic, and architectural analyses detail trade and exchange networks that existed among the extensive communities of Ancestral Puebloans in the Middle San Juan region. These communities served as adaptation centers for localized expression of regional cultural spheres of influence through time.

**Ross, Douglas (Albion Environmental Inc.) and Bridget Wall (Far Western Anthropological Research Group Inc.)**

[10]

*Combating the Ongoing Erasure of Native Americans from Late Nineteenth- and Twentieth-Century Archaeological Landscapes*

It's been over 25 years since Lightfoot published his seminal article on the ethnocentric and arbitrary dichotomy between prehistoric and historical archaeology, and numerous authors have since echoed his sentiment. Yet, problems of this nature persist in cultural resource management in California, as Panich and Schneider have demonstrated in their 2019 *American Antiquity* article. Precolonial and historic components of multicomponent sites are regularly treated differently, often investigated by different archaeologists and/or companies. This practice can result in a disjunction in recording methods, significance evaluations, and interpretive approaches that overlook the "invisible" time period between history and prehistory. As a result, sites occupied continuously across this temporal divide go unrecognized, as do single component historic-period Native American sites. This is especially true for the latter, which can be misidentified and deemed ineligible because they often contain a predominance of Euro-American artifacts and lack definable historical associations using standard archival sources. Such challenges can be resolved, or avoided entirely, by establishing a multidisciplinary collaborative team from the outset to include tribal consultants, ethnohistorians, and archaeologists. Ongoing investigations in Owens Valley in the eastern Sierra Nevada show how such problems arise, how they can be mitigated, and how they can be preemptively avoided.

**Ross, Jamie and Catherine Jalbert****[65]***Reviving Collections “At Rest”: Examining Recent Efforts to Promote Collections Research at CFAR*

The struggle to manage collections generated through the process of archaeological activity is ongoing despite decades of attempts to resolve the “curation crisis.” Artifacts collected in the field and their associated records are most often shelved in curatorial facilities and storage closets prone to disassociation and decay. In the best circumstances, these collections remain intact; however, few of even the best cared for collections are reexamined, and the epistemological underpinnings of their analyses are rarely questioned or reframed. To fully realize the role of legacy archaeological collections to inform our shared past, stewards of these collections must expand the paradigm of “traditional” collections use and look at innovative ways to use artifacts to teach and to serve a wider and more inclusive audience. In this paper, we examine unique programs undertaken by staff at the Curatorial Facility for Artifact Research (CFAR) and their collaborators. We highlight recent projects that have given a new life to old collections by using these collections as teaching tools, by expanding the contextual record of these collections, and by allowing a broader audience to inform our understanding of the meaning of these objects and the stories they tell.

**Ross, Jon (Ariel University), Itzick Shai (Institute of Archaeology, Ariel University), Kent Fowler (St John’s College, University of Manitoba) and Chris McKinny (Institute of Archaeology, Ariel University)****[191]***A Fingerprint Assemblage from a Late Bronze Age Canaanite Cultic Enclosure at Tel Burna in the Southern Levant: The Division of Labor According to Age and Sex*

The identity of producers is a perennial question in the anthropological and archaeological study of craft production. Who made the vessels and figurines used for ritual practice and feasting in the Canaanite cultic enclosure at Tel Burna? Our project attempts to answer this question by determining the age and sex of fingerprints preserved on a selection of figurines, jars, bowls, chalices, and jugs, from a spacious courtyard in a Late Bronze Age cultic enclosure. We report on the age and sex determinations of epidermal print impressions based on the analysis of ridge breadth and density. The results provide direct insights into the division of labor, the social context of pottery production, and the composition/demographics of the potters provisioning the objects used for ritual practice.

Ross, Sabrina [25] see White, Chantel

**Rossen, Jack (Commonwealth Heritage Group)****[111]***Discussant***Rossen, Jack (Commonwealth Heritage Group)****[19]***Two Long-Term Tom Dillehay Projects: Monte Verde, Zana, and the Processes of Archaeological Debate and Criticism*

The long-term projects of Tom Dillehay led the discipline through quagmires of criticism that exemplify the processes of paradigm freeze and thaw. His innovative archaeology drew criticism both responsible and irresponsible. It was a prolonged and messy process, but the scientific debate played out as Monte Verde (Chile) erased the Clovis barrier and Zana (Peru) changed conceptions of agricultural origins in South America. This paper discusses some lessons learned from these projects, the contributions of Tom Dillehay, and the next looming debate, the attempt to reconcile emerging biogenomic data with the archaeological record.

Rossi, Franco [125] see Griffin, Robert

Ross-Ibarra, Jeffrey [223] see Kennett, Douglas

**Rossi-Williams, Sonja (Indiana University of Pennsylvania)**

**[177]**

*Changes in Indigenous Occupation Strategies in Eastern Pennsylvania: An Exploration of Changing Land Use at the Red Hole Site*

This poster summarizes the preliminary results of a survey conducted in eastern Pennsylvania exploring land use through time performed as part of a master's thesis. The Red Hole site is in Schuylkill County's anthracite region and was identified in 1968 as a multicomponent campsite with occupations ranging from the Archaic to the contact periods. Due to minimal testing in this area, there is not much known about Indigenous settlement strategies or the details of the contact period. This project will utilize geophysical survey techniques and, as the environmental setting for this region is geomorphologically restrictive, will measure the effectiveness of those methods to identify Indigenous features. The research objective is to define the use of the site through time focusing on how cultural changes affected that use. Additionally, the project will identify if a contact period component exists at this site and how that may have impacted Indigenous land use. The historical background coupled with the limited testing makes this site ideal to explore these objectives. Correspondingly, this project has the potential to significantly contribute to the knowledge regarding Indigenous settlement patterns in eastern Pennsylvania through time, as well as the effect of the contact period in the Mid-Atlantic.

**Rossoni-Notter, Elena, Olivier Notter (Museum of Prehistoric Anthropology of Monaco) and Abdelkader Moussous (Museum of Prehistoric Anthropology of Monaco)**

**[87]**

*Contributions to Paleolithic Research: In the Steps of Albert I, Prince of Monaco*

Methodological research had been conducted from the late nineteenth century thanks to Albert I, Prince of Monaco. He is acknowledged across the world for his key role in Paleolithic issues and the history of science. Excavations and leading publications under his leadership bring the fruit of early experience and reflection. More than a century later, a wide-ranging historiographical endeavor uncovered new and interesting sources whereas current archaeological investigation and analyses allowed precise and detailed information. We will focus on the results obtained on three major and famous Paleolithic caves of the ligure-provençal area: Prince and Enfants in Balzi Rossi, Liguria, Italy, and Observatoire Cave in Monaco. This preliminary study aims at filling some multidisciplinary gaps based on a framework of global considerations as to remind the large-scale scientific projects of Prince Albert I.

Ross-Stallings, Nancy [102] see Wampler, Marc

**Rostain, Stéphen (National Center for Scientific Research, France)**

**[110]**

*Discussant*

Rotella, Brianna [99] see Sunell, Scott

**Roth, Barbara (UNLV) and Kara Jones (UNLV)**

**[168]**

*Lithics and Landscapes in the Mojave Desert*

Harold Dibble's focus on the multiple ways that lithics were used, modified, and transported across the landscape have been critical to Paleolithic studies but also have important applications in other areas. In this paper, we use data on lithic procurement, use, and reuse from sites in the Mojave Desert of southern Nevada and California to examine prehistoric forager land use. We document the different ways that lithics were used depending on the environmental setting within this desert environment, particularly focusing on

the differences between Holocene lakeshore sites and those away from these important and yet often ephemeral lake stands. We discuss the variability of lithic manufacture and use tied to differences in subsistence strategies and environment, something that Harold was instrumental in addressing for Paleolithic groups in Europe. Our goal is to show that Harold's ideas and impacts have broad-ranging applications in the archaeology of foraging groups worldwide.

**Rothwell, Jessica (Arizona State University), Anna Alexandropoulou (Ephorate of Antiquities of Piraeus and the Islands), Paraskevi Voula Tritsaroli (American School of Classical Studies, Athens) and Jane Buikstra (Arizona State University)**

[162]

*Love beyond What Is Lost: Expressions of Kinship through Mortuary Practice at Phaleron Cemetery*

While discussions of kinship in Ancient Greece have largely been limited to the elite and their families, the Archaic cemetery of Phaleron (700–480 BC) provides a unique opportunity to investigate kinship relationships among people of lower socioeconomic status. This is especially true of interments of children, which can be interpreted not only as a representation of that child's role in society, but a material expression of kinship by a child's parents or kin. Children buried at Phaleron tended to have much richer mortuary assemblages than adults and thus provide a window into not only the public mourning communicated through the burial itself, but expressions of grief through what parents or other kin chose to provide their children in death. This study investigates case studies of infants and young children, selected first by age-at-death and grave accompaniments, including the ceramic vessels in which they were interred and those provided to them, mainly oinochoes, cups, and skyphoi. By examining parental care both prior to and after death, this study explores kinship not in terms of biological relationships between individuals within a cemetery, but through the emotional attachments of those who buried their children.

Rothwell, Zachary [75] see Montero, Laurene

**Rowe, Robert, Jennifer Pelache (Burns & McDonnell) and Bradley Byrnes (Burns & McDonnell)**

[21]

*The Lone Spruce Site, a High-Altitude Seasonal Camp of the Upper Colorado River Basin*

5GA2312, the Lone Spruce Site, is located within the upper reaches of the Colorado River Basin in Grand County, Colorado, at 8,200 feet above sea level. The site was partially excavated in 2016 when 5,021 artifacts, 32% being identified as various types of scrapers, were recovered. Ninety-five percent of the assemblage is of Table Mountain jasper, which is readily locally available, however does not have a wide distribution beyond the upper Colorado River Basin. The second-most common material being Troublesome chert, the source of which is approximately 8 miles to west. Material originating out of the basin is identified as Parker petrified wood from the Front Range. Radiocarbon dating from hearths and post holes place the site within the late Paleoarchaic into the Archaic Mountain period. The site appears to support the hypothesis that indigenous mountain adaptations, with interior mountain valley residency along the river and up-down transhumance with the gathering of plant resources in the higher elevations, were well established by the late Paleoarchaic period.

**Rowe, Sarah (University of Texas, Rio Grande Valley)**

[237]

*Chair*

**Rowe, Sarah (University of Texas, Rio Grande Valley), Camila Jara (Pontificia Universidad Católica del Ecuador), Kepler Dimas (University of Texas, Rio Grande Valley) and Zindy Cruz (University of North Carolina, Charlotte)**

[237]

*Ritual and Productive Activities in the Mound-Top Structure at Buen Suceso*

Three seasons of excavation at Buen Suceso have identified a series of occupation floors in the area of the

site referred to as Unit 6. This area is also the highest at the site, suggesting the existence of a mound or an augmented rise that was utilized during the Valdivia period. This paper describes the occupation sequence of Unit 6, explores the evidence for mound construction in this location, and identifies activity areas within the occupational floors. Analysis of ceramics supports the identification of activity areas and allows for a preliminary seriation of ceramic types from Unit 6. Particular attention is given to the upper floor, for which the most information has been recovered in order to address activities in this structure and its function within the Buen Suceso site as a whole.

Rowe, Sarah [237] see Duke, Guy

Rowley-Conwy, Peter [203] see Yi, Hailin

Royer, Julie [21] see Brady, Ryan

Royle, Thomas [163] see Shichiza, Yuka

**Rozwadowski, Andrzej (Adam Mickiewicz University)  
[241]**

*Shamanic Images in Rock Art in Siberia: Global Theory and Regional Peculiarities*

Southern Siberia is the home of unique images of shamans, some of which show specific associations with rock surface features, notably fissures. In my previous research, I analyzed one such image from the Minusinsk Basin; namely, from the site of Ilinskaya Pisanitsa (*Cambridge Archaeological Journal*, 2017). In this presentation, I will show new, previously unpublished research that shows that associating images of shamans with cracks does indeed present a pattern. The question remains, however, is this a universal pattern in Siberian shamanic rock art? It will be suggested that linking images with cracks may be related to a specific ritual context and should not be expected to be a universally occurring feature in shamanic rock art imagery. These observations appear valuable not only for the Siberian context but also for the broader theory of shamanic rock art, including the North American research, where the association of images (interpreted as shamanic) with cracks has often been noted.

**Rubertone, Patricia (Brown University)  
[192]**

*Urban Renewal, Historic Preservation, and Indigenous Erasure*

Urban renewal and historical preservation are implicated in Indigenous erasure. Focusing on Providence, Rhode Island, I argue that the geographies of race and class of mid-twentieth-century urban renewal have a longer-term history in nineteenth-century land clearance projects. Among the disproportionate number of nonwhites affected were the city's Indigenous people who were its unseen victims. They were uprooted from their homes, edifices filled with the sounds, smells, noises, and feelings of being lived in that municipal planners considered substandard or blighted. Structural debris and earth filled with archaeological traces of deeper histories were removed and redeposited. This unmaking and making of sites complicate understandings of the Indigenous urban landscape. Historical preservation legislation designed to address the destructive impacts of urban redevelopment underserves the so-called "urban Indian" community and its history because of its reliance on thematic frameworks informed by terminal narratives that deny that Indigenous people can be modern and urban. Moving forward, urban histories need to be more inclusive and the eligibility criteria for historic preservation must recognize the modern heritage of Indigenous people in US cities routinely considered as lacking aesthetic value or sufficient integrity.

**Rubinatto Serrano, Juliana (University of Florida)****[76]***Ethnoarchaeology of Fisherpeople in the Lower Brazilian Amazon: Stability and Change of Riverine Practices*

In the last two decades, archaeological science in the Amazon has recognized the complex human forest management systems that co-constructed a hyper-productive forest environment. The study of how protein procurement strategies, particularly fishing, were integrated into past Amazonian economies has also improved with excavations of a few sites with significant faunal assemblages. This research introduces an exploratory ethnoarchaeological project in the Floresta Nacional de Caxiuanã, Pará, Brazil (lower Amazon), aimed at continuing recent advancements in our knowledge of past Amazonian riverine resource management. I argue that combining the study of archaeological faunal assemblages with ethnographic research on current fishing practices of *ribeirinho* (riverine) communities can illuminate our reconstruction of sociocultural and environmental change in the Amazon. I present preliminary results describing the faunal assemblages excavated from two archaeological sites, Ibama and Forte, together with baseline data on today's local fishing practices. Initial zooarchaeological and ethnographic results facilitate the development of hypotheses about past human-animal interactions and about changes in regional practices and dynamics. I propose directions for future archaeological and collaborative research in the Amazon to improve the investigation of past fishing practices so to create a more holistic understanding of Amazonian societies.

**Rubinson, Karen (Institute for the Study of Ancient World [ISAW], NYU) and Katheryn Linduff (University of Pittsburgh)****[141]***A Diverse Form of Organization in the Pazyryk Culture*

The Pazyryk Culture, situated in the Altai Mountains of Russia, Kazakhstan, Mongolia, and China, flourished for a relatively short period, fifth–third centuries BCE. A series of burial grounds from the later phase, fourth–mid-third centuries BCE, reveal the remains of three groups of individuals of high, mid, and lower status. Within the limiting topographical and environmental confines of the local region, in contrast to the vast grasslands of the steppe and the deserts and oases of Central Asia, it is possible to see nuances of interaction among these three groups and the regions immediately adjacent during this short period. Aided by modern scientific techniques including DNA and isotopic analysis, together with sophisticated excavation of often frozen remains, it is also possible to map out a heterarchical set of relationships within the hierarchical framework. The model developed in this unique landscape might be tested elsewhere in Eurasia.

**Rubinson, Samantha****[167]***Chair***Rubinson, Samantha****[167]***Thinking of Starting a Stewardship Program? Lessons Learned from the National Site Stewardship Network Survey 2022*

Over the last 15 years, there have been several surveys of cultural site stewardship programs. None, however, reach the scale of the 2022 National Site Stewardship Network Survey, which included over 30 programs across the United States and one in Scotland. This provided an opportunity to investigate what makes a program successful by looking at its structure, management, funding, resources, and the unique adaptations each program makes to work in the area it covers. Success in stewardship does not come from the application of a simple formula or a one-size-fits-all methodology. However, there are guidelines, when followed, that may increase the chances of success and longevity.

**Rudnicka, Emanuela (University of Warsaw)****[139]**

*Iconographic, Technological, and Contextual Analysis of Wari Pyro-Engraved Gourds from Castillo de Huarmey, Peru*  
The technological, stylistic, and iconographical aspects of decorated gourds are yet insufficiently addressed by researchers of precolumbian Andean art. This paper investigates Wari pyro-engraved gourd vessels that have been discovered during the excavation process at Castillo de Huarmey since 2013. The archaeological site is located in a Peruvian desert on the Pacific coast and contains a complex of richly equipped royal tombs of precolumbian Wari noblewomen. Among hundreds of artifacts made of clay, wood, bone, shell, stone, and metals, there were also gourd vessels decorated with geometric (lines, waves, spirals, step-fret) as well as figurative motifs (felines, birds, spiders, fish, as well as hybrid anthropomorphic and zoomorphic fantastic figures) that conceal a great research potential. Technological, iconographic, and iconological analysis of motifs suggest that Wari intentionally made use of imperial and local features in reference to other Andean traditions. The latest results of research advance the idea that the entire symbolic system of Wari gourd decoration could be an expression of imperial ideology based on the belief in the ability to influence natural phenomena through some kind of mimicry. This was probably the driving force behind Wari elite actions.

**Ruf, Kim (University of Cambridge; Harvard University)****[9]**

*Expressions of Ideology and the Consolidation of Social Complexity through Jade and Jadeite Material Culture in Precolumbian Costa Rica*

Using Costa Rican precolumbian jade, jadeite, and greenstone artifacts from the collections of the Peabody Museum of Archaeology and Ethnography, this study aims to amplify and widen the range of research carried out on the Isthmo-Colombian Area. It particularly seeks to examine and discuss the role of those objects as indicators of rank and prestige as well as how ideology is expressed through material culture—including the relevance of jade objects in social, political, and religious contexts. This is done via an analysis of the origins and distribution, as well as recognizable and categorizable forms and styles of those artifacts. Exploring iconographic nuances and symbolisms related to elites, this research provides insight into material culture related to the multifaceted nature of social complexity in prehistoric Costa Rica and seeks to shed further light on aspects regarding the emergence, expression, and consolidation of social complexity in the area.

Rufolo, Scott [114] see Desjardins, Sean

Ruiz, Christopher [155] see Krier, Jon

**Ruiz, Judith (Instituto de Investigaciones Antropológicas UNAM), Eric Taladoire (Universidad de Paris I Panthéon-Sorbonne), Edith Cienfuegos (Instituto de Geología, UNAM), Francisco Otero (Instituto de Geología, UNAM) and Gabriela Solis (Instituto de Geología, UNAM)****[172]**

*Dieta, movilidad y etnicidad en la antigua ciudad de Toniná, Chiapas*

En este trabajo presentamos evidencia de sacrificio humano y tratamientos póstumos de víctimas recuperadas en la antigua ciudad maya de Toniná, en el sureste de México. El depósito ritual data de Posclásico mesoamericano que comprende desde 950 hasta 1521 dC. El objetivo es conocer las huellas isotópicas de individuos que fueron parte del sacrificio humano, para reconstruir la paleodieta y el origen geográfico de tales víctimas. Para reconstruir la paleodieta y el origen geográfico utilizamos las relaciones isotópicas del nitrógeno ( $\delta^{15}\text{N}$ ) el carbono ( $\delta^{13}\text{C}$ ), el oxígeno ( $\delta^{18}\text{O}$ ) y el estroncio ( $^{86/87}\text{Sr}$ ) en huesos y dientes. Los estudios isotópicos arrojaron un patrón dietético con alto contenido de plantas  $\text{C}_4$ ; se estimó que el 68% de los individuos muestreados presentan el promedio local del valle de Toniná, mientras que el resto son individuos foráneos, es decir, menos de la mitad (32%). Esta información es enriquecida con los estudios iconográficos que indican las relaciones hostiles con sus vecinos de la depresión del Usumacinta durante el

Clásico. El estudio de este conjunto de huesos humanos aporta nuevas pistas sobre la pervivencia de la misma población en el valle, quienes mantuvieron el mismo sistema político durante el posclásico maya.

Ruiz, Judith [58] see Marengo Camacho, Nelda Issa

Ruiz Puerta, Emily [63] see Van Den Hurk, Youri

**Ruiz Vélez, Gabriela (University of Maryland)**

[140]

*Food Establishments and the Role Women Played in Nineteenth-Century Old San Juan, Puerto Rico*

This project studies food establishments that were commercially registered between 1897 and 1899 and the role that women played as business owners in Old San Juan, Puerto Rico. I analyzed primary sources, which included state-issued permits for local merchants, as well as diverse secondary sources to gain a clearer scope of the socioeconomic dynamics of late nineteenth-century Old San Juan. Commercial registries showed that men, women, and collectives held propriety of some of these locales. This project found women made up 10% of the total registered business owners, and also identified 37 food establishments in Old San Juan during this period. Therefore, this project concluded that women were active participants in the city's commercial activity, while the review of primary sources such as commercial registries is reaffirmed as a fundamental piece in the understanding of the socioeconomy in Puerto Rico. By using archival evidence, I challenge long-standing historical archaeology narratives about the traditional roles assigned to women by demonstrating that they played active roles in Old San Juan's socioeconomic activities during the nineteenth century beyond domestic roles.

Rumberger, Jacklyn [73] see Thornton, Erin

**Rush, Laurie (US Army, Fort Drum)**

[132]

*NAGPRA vs. Northwestern: It's Personal*

As a 21-year-old graduate student, I was present when an Indigenous ancestor, pipe in hand, was removed from the earth, placed in a box, and taken to storage. My encounter with this individual transformed and guided the course of my career in a field that has changed over the intervening decades and is working on recognition of human rights. I knew that disrespecting this burial was a violation of beliefs, values, and relationships of others, but I didn't try to stop the digging. I failed then, but over the past 45 years, I have tried to implement the concept of cultural relativism in my work and to be a respectful liaison between Fort Drum and its Nation Partners: Onondaga, Oneida, and Mohawk. The opportunity to learn from Indigenous colleagues has made me a thousand times better archaeologist than I could have ever hoped to be after training in an academic setting that featured no moral or ethical boundaries. When Northwestern asked for a bequest, I realized the debt I owe is to the ancestors and descendants we violated. My responsibility now is to do my part to insure they are able to return to their forever journeys.

**Russell, Hannah**

[7]

*On Our Honor: Exploring Washington State's Historical Use of Honor Camps in the Yacolt State Forest*

Following a series of catastrophic forest fires in Washington's Yacolt State Forest and the Gilford Pinchot National Forest between 1902 and 1952, the Washington Division of Forestry partnered with the Washington Department of Institutions to use inmate labor in remote locations to perform forest and fire management duties. Called Honor Camps, these labor camps were established by the Washington State Legislature in 1943, and modeled the example set by the CCC, to cheaply accomplish Washington

conservation goals and to reduce rates of recidivism among inmates. Between 1956 and 1972, selected inmates were housed at the Larch Mountain and Washougal Honor Camps in the Yacolt State Forest to conduct road and trail building, tree planting, snag cutting, and firefighting. Amidst this effort, 18 glulam-girder bridges were built using Honor Camp labor. Between 2020 and 2022, four of these bridges were recorded by Washington Department of Natural Resources archaeologists as part of routine compliance projects. Using these bridges as a stepping stone to examine social issues surrounding the Honor Camps, this presentation uses a critical lens to explore the racial make-up of Honor Camp inmates, the use of interned labor for state projects, and the lasting impacts of Washington's Honor Camps.

**Russell, Nerissa (Cornell University)**

[23]

*Discussant*

**Rutecki, Dawn (Grand Valley State University)**

[116]

*Chair*

**Rutecki, Dawn (Grand Valley State University)**

[116]

*Applied Archaeological Ethics: Inclusive Pedagogical Practices*

As archaeologists, our ethical obligations include responsibly training future generations of practitioners. Oftentimes, we understand this responsibility as taking the form of training proper field methods, timely and complete reporting of data, and other aspects that deal specifically with the physical aspects of archaeology—artifacts, records, and sites. Increasingly, this has also included commitment to engaging communities in archaeological work—modeling for students how to do this kind of deep work. Less discussed are the means by which we instill these aspects of training to ensure that as broad a range of students as possible not only can see themselves in archaeology as well as can usefully understand and apply these skills within their own positionalities of the world. This paper specifically discusses how intentionally inclusive pedagogical practices are extensions of our applied ethical obligations as archaeologists as much as other aspects of training, and essential to the continued relevance of archaeology to the broader world.

**Rutherford, Cady (University of Texas, San Antonio) and Marisol Cortes-Rincon (Cal Poly Humboldt)**

[183]

*Examining Production in Maya Households: A Case from the Settlement Zone of Dos Hombres*

Economic integration of households outside of site cores has often been under theorized in Maya scholarship. In this paper I explore the evidence of craft production and spatial relationships in several of these residential groups as well as the implications for connections with social, political, and economic institutions. These groups make decisions about crafting activities and respond to risks and stressors both environmental and political. The residential groups explored in this study are located in northwestern Belize on the outskirts of the site of Dos Hombres and were engaged in a number of different activities including food production and crafting. By exploring the material culture produced by household activities, we can gain an improved understanding of the various strategies that individual households employed for economic, social and political purposes. By gaining a more comprehensive understanding of intra-community strategies of households, we can begin to shed light on inter-community dynamics and the larger economic network.

Ruvalcaba, José Luis [89] see Faugere, Brigitte

**Ryan, Ethan and Anna Prentiss (University of Montana)****[170]***Obsidian Artifacts at 48PA551: Using Obsidian to Address Land Tenure Strategies among Hunter-Gatherers of the Rocky Mountains*

This research uses obsidian data from a single site in the GYE to test existing land tenure and territoriality models based on the sourcing and subsequent movement of obsidian. While on a spectrum, existing studies have generally polarized between two major schools of thought. These perspectives diverge over whether a single group or multiple groups were operating in the GYE and if they were practicing specific forms of territoriality and land tenure. This study does not seek to debate or reevaluate the models but instead tests them with a single dataset. The models are based on regional datasets that seek to understand broader patterns of prehistoric activity. The best way to test the validity of each hypothesis is to use new data from a site within the region and apply it to each model. With a large enough dataset, this approach, while relatively novel on its own, can significantly add to our understanding of prehistoric lifeways of the GYE. Dr. Larry Todd provided crucial obsidian sourcing data that made this study possible.

Ryan, Ethan [94] see Cannon, Kenneth

**Ryan, Susan (Crow Canyon Archaeological Center)****[90]***Chair***Ryan, Susan (Crow Canyon Archaeological Center)****[90]***Forty Years of Integrating American Indian Knowledge, Public Education, and Archaeological Research in the Central Mesa Verde Region*

The mission of the Crow Canyon Archaeological Center is to empower present and future generations by making the human past accessible and relevant through archaeological research, experiential education, and American Indian knowledge. The primary purpose of this symposium is to celebrate the Crow Canyon Archaeological Center's (CCAC) contributions in the past, present, and future by providing a backdrop to our nonprofit's humble beginnings in the 1980s and highlight key mission accomplishments in American Indian initiatives, public education, and archaeological research.

**Rybka, Ryan (University of Massachusetts, Amherst)****[234]***Unearthing a Pipeline: An Archaeological Investigation into Line 3 in Northern Minnesota*

Recent archaeological studies have shown how the methods and sensibilities of the discipline can be usefully drawn on to explore the history and relations of the Anthropocene—our current epoch of cultural and environmental instability. However, certain massively spatio-temporally distributed objects that define this era, what Timothy Morton calls hyper-objects, resist the traditional methods of archaeology. An oil pipeline like Enbridge's Line 3 in Minnesota, for instance, stretches 337 miles across the state and has existed for six decades as infrastructure. Its influence is omnipresent in daily life, and yet as an object it remains inaccessible to both locals and researchers. The oil and thick steel of the pipeline exist five feet underground—impossibly large and invisible to the eye. Over 60 years old, the pipeline is also a historical object, one whose persistence has had an enormous impact on the many communities—those for, against, and indifferent—that live in its invisible wake. In this paper, I propose an archaeological investigation into the Enbridge pipeline, one that attempts to study how its material presence and invisibility has created tensions, engagements, and activism among communities located in its path over the past six decades.

Ryden, Ron [99] see Chenault, Mark

Ryder, Christina [89] see Shield Chief Gover, Carlton

Rytter, Jens [173] see Martens, Vibeke

**Ryzewski, Krysta (Wayne State University), Tareq Ramadan (Project We Hope, Dream, Believe; Wayne State University) and Aaron Sims (Project We Hope, Dream, Believe)**  
[14]

*Civil Rights Heritage Preservation and the Malcolm X House: Archaeology in the Service of a Grassroots Movement*

An unassuming 800-square-foot home in working-class Inkster, Michigan, was, in some sense, the birthplace of Civil Rights leader Malcolm X in 1952. While living there he changed his name from Malcolm Little to Malcolm X and assumed the leadership roles in the Nation of Islam that launched his international prominence. By 2010 the Little family home was on the brink of demolition by neglect by its owner, the city of Inkster, until a local youth empowerment nonprofit—Project We Hope, Dream, Believe—intervened and secured the property’s future. The grassroots nonprofit has gradually succeeded in navigating local, state, and national historic preservation processes by partnering with educators and archaeologists. In 2022 archaeological interventions were conducted at the property in the service of the home’s restoration and community interests. This conversation involves the three partners who collaborated on the archaeological component of the project: nonprofit’s founder, the leader of the site’s preservation and fundraising successes, and the principal archaeologist. Our discussion considers the role of archaeology in contributing to the future of the Malcolm X house, empowering an underrepresented community, raising issues about access in the US historic preservation system, and promoting the heritage of the Civil Rights movement.

**Sabo, Allison (University of Miami), Daniel Koski-Karell (National Institute of Archaeology) and William Pestle (University of Miami)**

[42]

*¿Por Qué (No) Los Dos? Investigating Simultaneous Blade and Flake Industries at the Ortiz Site, Cabo Rojo, Puerto Rico*

Recent analysis of the lithic assemblage from the Ortiz site, an early (2340 cal BC–cal AD 310) habitation site in Cabo Rojo, Puerto Rico, has revealed the persistent parallel manufacture of blade and expedient flake technologies, with an average of 16.1% of the flaked stone assemblage consisting of blades. While other early Puerto Rican lithic assemblages can contain a small percentage of formal blades, little research has been conducted to determine why these distinct technological traditions were maintained simultaneously, and what work has been done often followed a culture-historical approach. Possible factors that could have informed ancient knappers’ decision to maintain, in parallel, two distinct lithic traditions, could have included the proximity, abundance, reliability, and quality of source material (chert), as well as the types of activities for which each technology were intended. Presented here are the results of morphological and microwear analyses of the Ortiz lithic assemblage, which sought to determine whether the presence of these distinct flake and blade industries can be explained by factors pertaining to raw materials, distinct use, or some other cultural factor. Ultimately, this work provides heretofore unavailable insights into technological processes and behaviors of some of the first peoples of Puerto Rico.

**Sachse, Frauke**

[52]

*Xmucane and Her Granddaughters: Maya Women as Creators of Time*

In the Popol Vuh, the creation of the world and humankind is conceptualized as a process of birth. The old creator couple Xmucane and Xpiyacoc are described as the first diviners, just like their counter parts Oxomoco and Cipactonal who are the first calendar priests in Central Mexican mythology. This paper explores the relation between human creation and divination, as encapsulated in the diphrastic kenning of *q’ij* “time” and *b’it* “shape.” The origin story of the K’iche’ refers to Xmucane as the “Grandmother of Day and

Light”—a metaphor for human offspring. With the beginning of Christianization, missionaries changed the Maya creation story, introducing new protagonists and erasing Xmucane’s role. We will discuss evidence from colonial sources for the theological basis for the role of Maya women in Mesoamerican ritual practice.

Sachse, Frauke [238] see Baron, Joanne

**Sakaguchi, Takashi and Satoshi Okamura (Hokkaido University of Education)**

**[205]**

*Sourcing of Grave Stones in the Late Jomon of Central Hokkaido*

The goal of this paper is to determine the source of grave stones for exploring the political economy among regional groups on the Ishikari Plain in the Late Jomon of central Hokkaido who created *shuteibo* (a type of communal cemetery characterized by a circular embankment). Our previous petrological analyses based on polarizing microscopical observation of thin sections, and major and trace element concentrations by XRF suggest that occupants at the Kashiwagi-B site located along the Izarigawa River used columnar jointed dacites from the Morap Mountain as stone grave markers (upright stones), while they used platy jointed andesites from the Monbetsu Mountain as stone grave arrangements. This research conducted the petrological analyses of grave stones recovered from the Bibi-4/Misawa-I sites located along Misawa Creek. The analyses suggest that occupants at Bibi-4/Misawa-I mainly used elongated sand stones and granites as grave stones, while they used a small number of platy jointed andesites as grave stones. At present, sources of these sand stones and granites are unknown; however, the difference of stone material, shape, and arrangement of grave stones between Kashiwagi-B and Bibi-4/Misawa-I indicates that variability of mortuary practices as well as possible different origins of regional groups who occupied these sites.

**Sakai, Sachiko (California State University, Long Beach)**

**[216]**

*Fine-Scale Investigation of Changes in the Ceramic Production Using Sherd Temper in the Mt. Trumbull Area of the Grand Canyon Parashant National Monument, Arizona*

This study is a part of an investigation into the adaptation patterns among the small-scale farmers who lived in a very marginal environment in the American Southwest. The examination of the changes in the ceramic production and distribution in the Mt. Trumbull and adjacent areas was conducted using LA-ICP-MS and optically stimulated luminescence (OSL) dating. This study suggested that the use of an optimal clay (i.e., a clay with a better performance) dominated the production of ceramics during the later time. This clay procurement pattern may correspond to a shift in dependence on more agriculture at a later time which may allow some individual to devote more time on the ceramic production to make more durable pottery, while some other focused on the agriculture. The temper type used for the ceramic production at Mt. Trumbull was predominately olivine as there is a source for it in this area. A closer examination suggests that some of the olivine- and sand-tempered ceramics also include sherd temper. In this paper, I would like to investigate if the changes in the use of sherd temper had any relation to the changes in the environmental conditions that may have impacted the local area’s agricultural productivity.

Salacain, Alan [201] see Genord, Kayla

Salas, Miriam [11] see Flynn-Arajdal, Yasmine

Salazar, Julián [142] see Cruz, Pablo

Salazar, Lucy [102] see Broomandkhoshbacht, Nasreen

**Salazar Chávez, Victor (George Washington University) and Jeffrey Blomster (George Washington University)****[146]**

*The Corn That We Eat: Feasting on Maize and Maize Diversity in the Early Formative Community of Etlatongo, in the Mixteca Alta of Oaxaca*

Recent excavations at Etlatongo recovered one of the largest analyzed macrobotanical samples for Early Formative Mesoamerica. We have explored the significant richness of species identified at the site, asserting that full-time agriculture was in place in the Highlands as early as the fourteenth century BCE. Here we turn specifically to maize, as the main staple crop in the community, to explore its interconnectedness with politics and social identities in the Mixteca Alta of Oaxaca. To do so, our work takes a contextual approach, providing information on the consumption of maize between two fundamentally different but complementary institutions at the site: the ballgame and its multifunctional nature for the development of public life and the family, centered in household cuisines. Our analysis documents different consumption patterns across the site, the cultivation of different maize varieties, some of them likely specific to the region, and the probable offering of maize in public ritual. Our work aims to provide a richer and novel understanding of maize, as one of the most culturally significant plants in Mesoamerica, and its role in the constitution of social relationships, returning Oaxaca to its crucial role in the understanding of the rise of agriculture and early sociopolitical complexity.

Salazar Chávez, Victor [146] see Sigafos, Rebecca

**Salcido, Ulysses (California State University, Los Angeles), James Brady (California State University, Los Angeles) and Guillermo de Anda (Gran Maya Aquifer Project)****[81]**

*Preliminary Observations on the Nature of the Balamkú Ceramic Assemblage*

The Gran Acuífero Maya conducted preliminary excavations in the entrance chamber of Balamkú yielding a small but interesting ceramic assemblage containing sherds of large incensarios and large numbers of miniature vessels that generally parallel the material documented at Balankanche cave. The high incidence of both incensarios and miniatures marks the function of the assemblage as being ritual in nature, a fact not seriously questioned. The Balamkú assemblage also consists of substantial amounts of unslipped and unslipped striated material of the poorest quality. Because of the poor quality, the ceramic is underreported in our collection as many sherds had separated longitudinally so we encountered only the exterior or interior surface attached to a portion of the paste. This material was not collected because of its very fragile condition. We suspect that the quality may be the result of low firing. The assemblage is of interest because it has led us to question assumptions made by the field about the nature of ceramic used in Maya ritual.

**Saldaña, Gabriela (Independent Researcher), Tia Watkins (University College London), Emma Messinger (University of Pittsburgh), Rosamund Fitzmaurice (University College London) and Jaime Awe (Northern Arizona University)****[28]**

*Iconographic Themes among Classic Maya Graffiti: A Comparative Case Study from Xunantunich, Belize*

Classic Maya graffiti (AD 300–800) provides a unique perspective of individual experiences, with figures etched onto plastered surfaces that were added as secondary elements within existing architecture. In the Maya lowlands, graffiti is typically found within monumental architecture, as these contexts favor preservation in tropical environments. The architectural media on which graffiti is found primarily include walls, floors, benches, door jambs, and vaulted ceilings. However, some portable media such as ceramic and slate have also been documented. Here we assess the graffiti assemblage from the major ceremonial center Xunantunich in central Belize to determine categorical themes present within the assemblage including anthropomorphic and zoomorphic figures, depictions of architecture, geometric patterns, and glyphic annotations, among other themes. We present a brief comparison of the categorical themes identified in the Xunantunich assemblage with other graffiti assemblages noted across the Maya lowlands to understand broad patterns in the shared human experience during the Classic period.

Saldaña, Gabriela [74] see Messinger, Emma

**Saldana, Melanie (California State University, Los Angeles)**

[196]

*Chair*

**Saldana, Melanie (California State University, Los Angeles), James Brady (California State University, Los Angeles) and Christian Mora (California State University, Los Angeles)**

[196]

*Archaeological Evidence for the Use of Maize in Cave Ritual*

Variations in the deposition of maize remains have been noted in different Maya caves. These vary from the discovery of small immature cobs, 3–5 cm in length, which appear to represent first fruit rituals to large deposits of mature cobs in ritual contexts that appear to have been burned at a high enough temperature to have fused the silicates within the kernels and cobs into a large mass. Recent radiocarbon dating provides chronological framework for the latter ritual.

**Sallum, Marianne (University of São Paulo; University of Lisbon), Julieta Flores-Muñoz (Universidad Veracruzana) and Francisco Silva Noelli (University of Lisbon, Portugal)**

[132]

*Decolonizing Latin American Archaeology: “Affective Alliances” with Communities of Practice*

Communities of practice are currently the majority of places in Latin America. They include Indigenous people, “*quilombolas*,” and their descendants with European and Asian people, living predominantly outside the cities, in the most diverse places, such as the agroforestry communities. Decolonized archaeology has an enormous challenge ahead of it, both in developing diverse research themes as well as establishing an “affective” alliance with such communities by engaging in a genuine dialog among diverse epistemes.

Salomon, Hélène [28] see Chanteraud, Claire

Samadelli, Marco [226] see Smetana, Michael

**Sampson, Christina (Everett Community College)**

[211]

*Collaborative and Open Education Practices in Undergraduate Anthropology Instruction*

Open education (also known as open pedagogy) begins with the values of sharing and accessibility that have motivated the increased use of Open Educational Resources (OER) throughout higher education. Open education is not only about the adoption of OER materials; it also involves a shift in teaching orientation toward an emphasis on co-creation and community building. This talk explores the implementation of open education practices in anthropology courses at a two-year college. I present examples of assignments, activities, and course structure that are intended to meet the goals of open education. I discuss how collaborative assignments can foster creativity and connection while avoiding the pitfalls common with “group projects.” Open education can help instructors respond to contemporary challenges and changes in higher education including shifts to online and hybrid instruction, teaching student populations with varied educational backgrounds, and teaching in times of crisis.

**Samuels, Amanda (University at Albany), Christopher Wolff (University at Albany), Donald Holly (Eastern Illinois University), Michelle Bebbler (Kent State University) and Metin Eren (Kent State University)**

[219]

*From Stone to Iron: Effects of Colonial Materials on Beothuk Traditional Technology*

The impacts of colonialism on Indigenous groups’ technological traditions have often been viewed through

acculturative lenses that only reach surface deep. While there have been more recent trends criticizing this methodology, acculturative approaches are still prevalent, and they tend to obscure complex socio-cultural processes that are affected by changing technology. Our experimental research focused on the ways in which Beothuk technological practice was transformed once European fishers, trappers, and colonists arrived at the island of Newfoundland. It is widely accepted that the Beothuk abandoned lithic technology for iron once it was introduced by Europeans, but it is largely unknown how this change affected Beothuk tool production and use. Moreover, a deeper, socio-cultural lens was needed to analyze how the differences in technological practice throughout the colonial period might have impacted the Beothuk people. Through reproduction and ballistics experimentation using both lithic and iron-tipped arrows we analyzed the variance in penetrative capabilities. Our results demonstrate how functional differences may have impacted Beothuk tool production and use, but also speak to more complex understandings of Beothuk identity.

Samuels, Amanda [49] see Holly, Donald

Samuels, Amanda [219] see Wolff, Christopher

**Samuelson, John (Arkansas Archeological Survey; University of Arkansas)**

[8]

*Chair*

**Samuelson, John (Arkansas Archeological Survey; University of Arkansas), Elizabeth Horton (Rattlesnake Master LLC) and Adriana Potra (University of Arkansas)**

[8]

*Testing the Geographical Sourcing of Rivercane Using Pb/Sr Isotopes and Trace Elements in Arkansas and Oklahoma*

The use of rivercane in ancient basketry and other ancient materials presents an opportunity to understand how culturally important objects were used and moved across the landscape. Examples of ritual and subsistence related basketry have been found at Spiro and in the Ozark Mountains, some of which are expected to come from other locations. Modern plant and soil samples were collected to test the application of Pb and Sr isotopes and trace element analysis for evaluating geographic origins of ancient rivercane in Arkansas and Oklahoma. Several sites in Arkansas and Oklahoma were tested, including Spiro, Crenshaw, and Parkin. Results are compared to previously sampled ancient animal remains, human remains, and soil from the same sites to test the utility of these methods. While the results are limited, they suggest that Sr and trace elements may be fruitful if analyzed appropriately. As expected, Pb isotopes from modern plants may have been affected by anthropogenic Pb but show that enough Pb was present to obtain usable results. Several different modern and ancient datasets matched in different site locations, illustrating the usability of these methods for testing origins of ancient basketry.

Sanchez, Andres [125] see Maldonado, Blanca

**Sanchez, Fabiola (University of Victoria)**

[239]

*Fire-Cracked Rock: Domestic Life and Subsistence Practice, a Case Study in Coast Salish Territory*

Two of the most common features that frequently appear in many Northwest Coast archaeological sites are pit ovens and rock griddles with abundant remains of rock heating elements or fire-cracked rocks (FCR). Ethnohistorical and ethnographic sources have provided documentation of the different types of culinary traditions and the earth oven morphologies used among Coast Salish people. However, considering the use of different technologies and its understudied archaeological signatures, there are gaps in understanding traditional ecological knowledge (TEK). My research examines the possible function(s) of a large steaming or roasting feature in the Cowichan Valley, Vancouver Island. This presentation discusses the methods and the results of experimental research conducted in collaboration with Coast Salish people in the Cowichan Valley, applying their Indigenous worldviews to understand how their culture is embedded in their foodways, technologies, and the socioecological landscape.

Sanchez, Fabiola [172] see Palka, Joel

Sánchez, Guadalupe [41] see Davidson, Jaron

Sánchez, Guadalupe [48] see Krug, Andrew

Sanchez-Borjas, Angel [230] see Mesia-Montenegro, Christian

**Sánchez Gamboa, Ángel (Coordinación Nacional de Conservación del Patrimonio Cultural-  
INAH) and Caitlin Earley (University of Washington)**  
[172]

*Geopolitics and Style in the Eastern Highlands of Chiapas during the Late Classic*

The scarce glyphic corpus recorded in the Eastern Highlands of Chiapas makes it difficult to reconstruct dynastic lineages in this western frontier region of the Maya world; Chinkultic is the only case of study in which we find important epigraphic evidence. As a result, material culture and style are key elements to understand political dynamics and trade networks between the Comitán Valley, the Montebello region, the Upper Grijalva, the Chaculá-Quen Santo region, and even the Sierra Madre of Chiapas. In this paper, we examine iconographic and stylistic innovation in the Eastern Highlands as attested on different media, including sculpture (Chinkultic, Tenam Puente, Tenam Rosario, Sachchaná, Piedra Labrada, etc.) and mold-made pottery (Tenam Rosario, Loma Zorrillo, Guajilar, Ojo de Agua, Los Cimientos, etc.). Combined, these objects enable the construction of a panoramic view of a frontier political landscape during the Late Classic period.

**Sanchez Guerrero, Andres Francisco (Colegio de Michoacán), Blanca Maldonado (Colegio de  
Michoacán), David Larreina-Garcia (UPV-EHU: University of the Basque Country), Luis  
Velázquez-Maldonado (Colegio de Michoacán) and Fernando May (Colegio de Michoacán)**  
[13]

*Archaeometallurgy and Productive Processes: Understanding Copper Smelting Production in the Prehispanic and Colonial Site of Jicalán, Michoacán, Mexico*

This paper focuses on the characterization of technological processes used for producing copper at the archaeological site of Jicalán Viejo, Michoacán, in Western Mexico, which includes both prehispanic and colonial contexts. We carried out an archaeometallurgical study of slag samples recovered from the surface in an area labeled "Transectos." Preliminary results from optical microscopy (OP), scanning electron microscope (SEM), and X-ray fluorescence (XRF) have shown some interesting findings about the smelting activities at this location.

**Sánchez-Morales, Ismael (University of Arizona)**  
[33]

*Variability of Clovis Lithic Assemblages from El Fin del Mundo and the San Pedro River Valley*

Clovis populations have been traditionally characterized as wide ranging, highly mobile foragers, as reflected most notably in the intense utilization of high quality, nonlocal cryptocrystalline lithic raw materials. However, in Sonora, Mexico, local non-cryptocrystalline toolstones dominate Clovis point assemblages and sources of igneous rocks were intensively exploited by Clovis flintknappers at the site of El Fin del Mundo. Additionally, the large size of the lithic assemblage from this site and its varied tool type composition seem to contrast with the Clovis record of the San Pedro River Valley (SPV) in Arizona, only 250 km away, which is highly dominated by Clovis points and exogenous, high-quality raw materials. This has been interpreted as variability of landscape use strategies between these two regions. However, a comparative analysis of the Clovis lithic assemblages, as well as the location of the sites within their local landscape, indicate that lithic assemblage variability is instead driven by site use, the proximity of sources of lower-quality raw materials to other significant resources, and taphonomic processes. El Fin del Mundo and the SPV are best interpreted as reflecting different facets of the same landscape-use strategies and are both consistent with traditional views of Clovis behavior.

**Sánchez-Morales, Lara and Timothy Beach (University of Texas, Austin)****[54]***Revisiting the Laguna Tortuguero Paleoenvironmental Record in Puerto Rico: New Data for an Old Record*

I present an interpretation of a 5 m sedimentary sequence from Laguna Tortuguero, Puerto Rico, based on new radiocarbon dates, X-ray diffraction, magnetic susceptibility, and carbon isotope data. I also highlight the merits of revisiting old but significant paleoenvironmental records to understand past human-environment interactions amid shifting paradigms in archaeology by broadening the scope of proxies used. As part of my dissertation—which looks at human-environment interactions in Puerto Rico’s north-central region through a historical ecology lens—my team and I replicated a previously published paleoenvironmental study (Burney et al. 1994). Burney’s study of Tortuguero remains one of the most influential paleoenvironmental records in the literature of the region, especially in Puerto Rican archaeology where chronologies are currently under revision. Burney’s original core provided a ~7,000-year-old microcharcoal sequence that spiked ca. 5300 cal BP and thus interpreted as a proxy for anthropogenic forest fires that signaled initial human colonization of the island. Their proposal pushed back the timing of human arrival to Puerto Rico by ~2,000 years and, although unsupported by the archaeological record at the time, new investigations of Archaic sites now situate the period of human colonization of the island much closer to Burney’s estimated timing.

Sánchez-Morales, Lara [54] see Smith, Byron

**Sánchez Mosquera, Amelia (Consultora en Patrimonio y Cultura)****[5]***Discussant*

Sánchez-Villagra, Marcelo [228] see Rangel de Lázaro, Gizel

Sand, Christophe [166] see Chiu, Scarlett

**Sanders, Mark and Phyllisa Eisentraut (Santa Barbara City College)****[160]***The Spiro Panoply: An Examination, Structural Analysis, and Hypothetical Re-creation of Middle Mississippian Defensive Equipment and Weapon Systems*

With the recognition that violence, warfare, and trophy display within the North American Southeast was endemic during the Mississippian Cultural period, an in-depth analysis of the equipment used by warring groups is now necessary. By examining the “Conquering Warrior” and associated human effigy pipes from the Great Mortuary at Spiro Mounds and elsewhere, an identification and hypothetical re-creation of the armor components evident on the figure(s) can be undertaken, elements of their use and function analyzed through experimental reconstruction and testing, and cross-cultural comparisons to analogous armor traditions and personal defensive equipment made. Taken together, these studies and experimental reconstructions will lead to a better understanding of the material practices of Middle Mississippian and associated regional expressions’ methods of organized violence, the display by individuals within a martial and social context, and recognition of socioeconomic elements applied to the individual and their connections to the Mississippian Ideological Interaction Sphere and beyond.

**Sandgathe, Dennis (Dept. of Archaeology, Simon Fraser University)****[212]***Harold Dibble’s Approach to Understanding the Middle Paleolithic Archaeological Record: Neanderthals outside the Box*

Harold Dibble was one of the most prominent Paleolithic archaeologists of the last century researching the Middle Paleolithic of Eurasia. While he made significant contributions in a number of important areas, one of his main contributions was to encourage researchers to try to think beyond the limitations of mainstream,

dogmatic, historic views when trying to interpret the archaeological record and understand Paleolithic prehistory. In particular, he argued that we should be trying to understand Neanderthal behavior and adaptations based on the available evidence and not in reference to us *Homo sapiens*.

Sandgathe, Dennis [50] see Collard, Mark

**Sando, Paul (Minnesota State University Moorhead)**

[57]

*Fadeaway Environments and How Infrastructure Change Creates Ghost Towns and Societal Remnants*

Infrastructure decisions influence human settlement and can leave archaeological and geographic evidence for us to discover and decipher. Discovery in that much of this evidence has faded away into the environmental background of current human occupation and can be rediscovered by archaeological and geographic sleuthing. Small towns and settled places in the Great Plains exhibit examples of the traits of fading and disappearing into the settled landscape. This presentation looks at two places that have faded from human notice due to infrastructure change: Winnipeg Junction, MN, and VanHook, ND. Both places have faded, but for different reasons. One was heavily influenced by a railroad, and the other by both a railroad and construction of a reservoir. How these places get rediscovered is also varied, one was revealed by an actual archaeological search and the other by drought. Evidence as to why they faded is also there to be discovered by archaeological and geospatial investigation. We can also infer the infrastructure change and the consequences that led to the demise of these as settled places and the movement or erasure of the cultural evidence. In both cases, the environment also drove both the infrastructure decisions and the consequences of change.

**Sandweiss, Dan (University of Maine)**

[4]

*Discussant*

**Sandweiss, Dan (University of Maine)**

[223]

*What the Shells Tell: Interdisciplinary Malacoarchaeology and Holocene Paleoclimate in Coastal Peru*

Dolores Piperno has been a trailblazer in interdisciplinary research, building on deep, innovative approaches to plant remains to answer a multitude of questions in archaeology and beyond. In this interdisciplinary spirit, I review research into Holocene paleoclimate along the Peruvian coast derived in the first instance from the study of archaeological mollusk remains. This work began in the 1960s, has involved many investigators, and has employed a diversity of approaches: ethnoarchaeology, zooarchaeology, biogeography, and the analysis of growth increments, isotopes, and trace elements. Early results suggested a simplistic model of Holocene paleoclimate in this region. Over the last quarter century, the addition of other proxies and a growing database offer a much more complex, locally nuanced climate history linked directly to archaeological phenomena—a history that is necessary to understand human eco-dynamics in this climatically dynamic and environmentally extreme region.

**Sanford, Natalie (US Fish and Wildlife Service)**

[235]

*Ecological Succession of the Laurentide Ice Sheet: A Study of Human Colonization Lag in the Late Pleistocene and Early Holocene Radiocarbon Record*

The ice margin chronology for North America provides archaeologists with discrete spatial units, much like stratigraphic units of an excavation grid, that aid in interpreting the archaeological record of colonizing populations. Treating deglaciation as an opening for a subsequent colonization event, ice recession helps contextualize Paleoindian population growth rates, distribution, and densities by looking at how quickly once glaciated lands were colonized after the widespread peopling of the Americas. Using discrete ice recession intervals for the continental extent of the Laurentide Ice Sheet from 15,100 to 6,900 years ago and the oldest

10 radiocarbon dates per interval, I calculate a lag measure between deglaciation and the appearance of geological, paleontological, and archaeological materials. There is an average lag of approximately 4,000 years between ice recession and archaeological radiocarbon dates, suggesting delayed colonization of the Laurentide Ice Sheet area. These data can aid in interpreting colonization models that use assumed population growth rates because a larger lag measure is interpreted as a very slow population growth rate, particularly if the Americas were colonized before or during the Last Glacial Maximum. This study can also contribute to further study of what a colonizing event may look like in the radiocarbon record.

**Sanger, Matthew (National Museum of the American Indian)**

**[219]**

*Ancient Use of Copper in the Southeast United States*

While Indigenous copper use in the Southeast United States is well documented in later Woodland and Mississippian periods, far less is known about earlier metallurgical practices and exchange. This paper documents our current state of knowledge and considers the importance of metal in the lives of Archaic peoples in the region. While examples and evidence for copper use are slim, the presence of copper in several key locations suggests that it was a highly prized material that was closely tied to long-distance exchange relations, important cosmological events, sacred landscapes, and emergent conceptions of power and elitism.

Sanger, Matthew [49] see Cajigas, Rachel

Sanger, Matthew [9] see Lawres, Nathan

Sankey, Joel [176] see Fairley, Helen

Santana-Sagredo, Francisca [235] see Vidal-Elgueta, Alejandra

**Santarone, Paul, William Eckerle (Cannon Heritage Consultants), Katherine Puseman and Kenneth Cannon (Cannon Heritage Consultants)**

**[82]**

*Where You Least Expect It: A Preliminary Report on Excavations at 26EK16689*

Site 26EK16689 is a multiple component open archaeological site near West Wendover, Nevada, approximately three miles from Danger Cave. Despite a history of inundation, ground disturbance, and generally rough treatment, excavations have shown that site 26EK16689 preserves extensive and intact cultural deposits with good organic preservation. In addition, diagnostic artifacts and radiocarbon dates provide evidence of repeated use beginning at least during the Early Archaic and continuing until the Late Precontact period. In this paper, we discuss the geologic setting and context of the site and provide some preliminary results from our ongoing analysis. We also touch on the importance of this open site for providing a dataset to further contextualize the findings from the several well-known caves and rockshelters nearby.

Santisteban, Sintia [70] see Guzman Garcia, Milena

Santisteban, Sintia [82] see Watanave, Aldo

**Santoro, Calogero (Universidad Tarapacá, Arica, Chile), Paula Ugalde (University of Arizona), Daniela Osorio (University College London) and Katherine Herrera (Université Paris Nante)**

**[61]**

*The Long-Term Trajectory of Tom Dalton Dillehay in Chile*

Tom Dillehay appeared publicly in Chile in October 1976 during the VII Congreso Nacional de Arqueología Chilena. Since then more than 16,769 days have passed, a figure that exceeds the archaeological depth, in

thousands of calibrated years, that Tom has imprinted on the human history of the Andes, in western South America, *Where the Land Meets the Sea*, as the title of one of his recent book states, in which together with a large team of specialists from several countries, he recounts “14,000 Years of Human History on the Northern Coast of Peru.” In this essay, we present some of the salient aspects of his archaeological, ethnoarchaeological, ethnographic, and historical research career in Chile, based on a long conversation we had with Tom at the Laboratory of Archaeology and Paleoenvironment of the High Research Institute of the University of Tarapacá, in Arica, Chile, in 2015.

Santoro, Calogero [206] see Correa, Jacqueline  
 Santoro, Calogero [177] see Tripcevich, Nicholas  
 Santoro, Calogero [114] see Ugalde, Paula

**Saper, Shelby (University of Nevada, Reno), Richard Rosencrance (University of Nevada, Reno), Katelyn McDonough (University of Oregon), Geoffrey Smith (University of Nevada, Reno) and Dennis Jenkins (University of Oregon)**

[21]

*Assessing Typology of Pre-Mazama Corner-Notched Points in the Great Basin*

Some researchers support a “long” chronology for corner-notched points in the northern and eastern Great Basin, with some points dating as old as 8500 cal BP. Other researchers support a “short” chronology and argue that corner-notched points almost exclusively postdate 5000 cal BP. This debate suffers from the use of a variety of typological schemes, potential regional variability, and a lack of buried sites. In this paper we present new data for corner-notched projectile points from well-stratified and dated contexts at the Connley Caves, Oregon. Additionally, we incorporate the typological analysis of both pre- and post-Mazama points from other localities across the northern and eastern Great Basin. This project considers the significance of these data within the broader context of early and middle Holocene projectile technology in the region.

**Sarathi, Akshay (Texas A&M University)**

[51]

*Discussant*

**Sarathi, Akshay (Texas A&M University), Laure Dussubieux (Field Museum) and Jonathan Walz (SIT-Graduate)**

[210]

*A Comparison of the Glass Bead Trade at Unguja Ukuu and Kizimkazi Dimbani, Zanzibar*

Unguja Ukuu (sixth–eleventh centuries CE) and Kizimkazi Dimbani (twelfth century CE) are early trading sites on Zanzibar, an island off the coast of Tanzania in eastern Africa. Here we investigate patterns of glass bead trade at these sites, examining continuities and change between sites and over time. Glass bead samples from each site were subject to LA-ICP-MS analysis to determine their elemental composition and provenance. Comparison of the results shows a variance in glass bead distribution patterns that is likely due to the difference in the main periods of occupation of each site. This allows us to observe changing exchange trends over time on the island of Zanzibar. The results of this study show that while patterns of trade may change in some significant ways, the fundamental connection established at least in the first millennium CE between Zanzibar and the Indian Ocean World remained intact for centuries.

Saravia, Francisco [238] see Ortiz, Jose Raul

Sarazin, Merv [132] see Desrosiers, Pierre

Sarich, Steven [72] see Haefner, Joseph

**Sarmientos, Igor**

[34]

*A Preliminary Archaeomusicological and Ethnomusicological Interpretation of the Murals of San Gaspar Chajul*

In this paper, the author discusses an interpretation of the iconography of the murals of Chajul, Quiche, in the highlands of Guatemala. The murals consist of several paintings of Ixil-Maya culture music and dances from the late colonial period. An approach from archaeomusicology and ethnomusicology has been applied in this analysis both from the social sciences and an artistic perspective. In order to achieve a better understanding of these historical vestiges, the comparison of ancient and living traditions together with ethnographic sources is a key element resulting from the research of these frescoes. The murals were found on the walls of private houses owned by Ixil families who inherited them from their ancestors. The present essay aims, in the first place, to identify, raise opinion and theorize from an interdisciplinary point of view as a part of musicological, anthropological, and archaeomusicological studies; in particular, it deepens into a sensorial perception of these images by means of the instruments and the musicians characterized on it. By applying a phenomenological analysis of the iconography, as well as ethnographic and ethnohistoric research, playing techniques, and “movements” observed in each of the personages, were also compared to modern musicians and context.

Sarmientos, Igor [34] see Howell, Mark

Sato, Yune [249] see Kanazaki, Yuko

**Sattler, James (City of Albuquerque Open Space Division)**

[215]

*The Tijeras Cultural Corridor Plan: Connecting Community to the Natural and Cultural History of Tijeras Canyon*

Tijeras Canyon has long been a corridor of migration for wildlife and humans, and the presence of water has and continues to make this place a special place. From shaping of the landscape, to settlement, and sacred places, water is at the heart of Tijeras Canyon. There are deep meanings in this landscape and special places to be protected and interpreted. Through the efforts of the City of Albuquerque’s Open Space Division and its partners, the Tijeras Creek Cultural Corridor Plan seeks to interpret these stories as well as protect the natural and cultural resources found in this area, while providing recreational trails and opportunities for the public to participate in caring for and sustaining the land for future generations.

**Sattler, Robert**

[72]

*Tanana Chiefs Conference: CRM in a Tribal Consortium, Interior Alaska*

Tanana Chiefs Conference (TCC) is a tribal consortium of 37 federally recognized Tribes and five village associations across subarctic Interior Alaska. Based in Fairbanks, the agency represents tribal membership across most of the Yukon River basin and the Upper Kuskokwim river basin. TCC manages a self-governance compact with the Bureau of Indian Affairs for trust services and provides supplemental cultural resources management services in collaboration with state, federal and other tribal organizations. Through the compact, cultural resources management services are provided to restricted landowners of Native allotments and village townsites in and between the membership communities. Since the federal archaeology function was assumed by the tribal agency in the middle 1990s, a broad range of services and projects are in a cultural resources portfolio. Multiple services and projects will be highlighted including field inventories across the region, data recovery projects, field school sessions, tribal consultations, collaborative research, interagency land planning engagement and advocacy in federal and state environmental quality reviews.

**Sauer, Jacob (Vanderbilt University) and Teresa Franco****[19]***De la Costa a la Cordillera: Long-Term Cultural Developments in Chile*

Through multiple research projects, collaborations, and university appointments, Tom Dillehay impacted anthropological investigations throughout Chile, from the northern coasts of the Atacama desert south to the temperate forests of Patagonia, and the entire length of the Andes. Though multifaceted in approaches, one common theme appears in much of this work: the processes that go into human cultural development at different time periods and stages of sociocultural complexity and the utility of cross-cultural comparison. Here we provide two case studies that illustrate Dillehay's influence in broader examinations of cultural developments in Chile. From the north coast, the Chinchorro culture, famous for the oldest examples of mummification in the world, exploited marine resources and developed technological and symbolic sophistication over 6,000 years ago. In the south, long-term development in Mapuche cultural practices influenced their defeat of the Spanish in the sixteenth century and maintenance of long-term cultural practices and patterns into the present.

Saunders, Chris [116] see Napora, Katharine

**Saunders, Jennifer****[138]***"From Enslavement to Empowerment" and What Comes After: Plantation Futures on a Palimpsestic Landscape*

The idea of the landscape as a palimpsest, where traces of a former version can be read under the present one, came out of Paleolithic archaeology, where thousands of years of human activity must be read through low-density artifact scatters. In 2013's "Plantation Futures," Black geographer Katherine McKittrick describes the plantation landscape as a "meaningful conceptual palimpsest" that underpins the association between Blackness, geographic othering, and dispossession. McKittrick's "plantation futures," however, are ultimately hopeful—or rather, McKittrick is hopeful about the potential to avoid what would seem to be an inevitable outcome of continued oppression. In Powhatan County, Virginia, St. Emma Military Academy and St. Francis de Sales School, two Catholic-run boarding schools for African American and Native American students, were housed on the former grounds of Belmead Plantation—what one stakeholder group described as going "from enslavement to empowerment." How did living on this palimpsestic landscape shape students' experiences? Did lingering plantation logic inform their daily practices? And now that St. Emma and St. Francis de Sales are closed and the property under private ownership, will plantation logic relegate them to obscurity based on their Blackness, or can archaeology help unbind this Black future from the plantation?

Saunters, Bobby [44] see Donnermeyer, Christopher

Savidge, Andrew [105] see Kardulias, Drosos

**Savkovic, Aleksandra (Universitat Rovira i Virgili, Spain), Katarina Bogicevic (University of Belgrade) and Dragana Djuric (Museum of Natural History)****[240]***Avifaunal Remains from Crvena Stijena (Petrovići, Montenegro, Eastern Europe)*

Avian remains from the Paleolithic site of Crvena Stijena, located near the village Petrovići, Eastern Montenegro, have been studied. The inspected material comes from the samples collected in the field during the previous three years of research (2018, 2019, and 2021). Based on the previous faunal research, Crvena Stijena fauna apparently lived in a colder, drier climate than the recent one in this area. Recently, the development of taphonomically oriented studies of avifaunal assemblages has contributed to renewing our perceptions of the complexity of Neanderthal behavioral adaptations in Europe. In light of the limited number of such taphonomic studies of bird samples, in this work, we provide new data from this site.

**Savoy, Megan (University of Michigan)****[29]***An Exploration into Ancient Human Diet Using Stable Isotopes from Helminth Eggs***[WITHDRAWN]****Sayers, Daniel (American University)****[57]***Discussant*

Sayle, Kerry [134] see Hamilton, Derek

**Sayre, Matthew (High Point University)****[223]***Chair*

Sayre, Matthew [223] see Weber, Sadie

Scaffidi, Beth [45] see Leachman, Robert

Scaffidi, Beth [29] see Nino, Sabrina

**Schach, Emily (University of California, Santa Cruz) and Jane Buikstra (Arizona State University)****[28]***Textile Coca Containers from Chiribaya Alta, Peru*

While the bioarchaeology of Chiribaya Alta is well documented, there is little available data from the textiles at the site. This poster presents data from three types of textile coca containers recovered from the mortuary contexts at Chiribaya Alta. These are chuspas, or coca bags, which are brightly colored and often decorated with three stripes of iconographic designs. Inkuñas, or kerchiefs used for coca bundles, are less often decorated with iconography but have weft twining at the warp selvages. The third type of container is bolsa-fajas, which are long rectangular bags with braided ties at the end. These also are brightly colored and decorated with iconography. In this poster, we summarize the technical elements of these different textile containers and consider their social significance as a part of coca ritual, mortuary practice, and identity.

Schach, Emily [27] see Witte, Emilee

**Schaefer, Benjamin (University of Illinois; Field Museum of Natural History), Gabriel Prieto (University of Florida), John Verano (Tulane University) and Michael Colton (University of Illinois, Chicago)****[134]***Assessing Systemic Stress from Archaeological Hormones Recovered from Hair of Human Sacrifices at Huanchaquito Las Llamas, Peru (~1450 CE)*

Excavations at the Peruvian northern coastal site of Huanchaquito-Las Llamas (HLL) revealed the largest mass human sacrifice event in the Americas, with more than 400 sacrificed children, women, and camelids governed under the Chimú State. Dated to the Chimú's imperial decline (circa 1450 CE), preliminary genetic analyses indicate that these children were drawn from multiple regions and ethnic groups throughout the empire. Based on the frequency and location of the cut marks, their hearts were cut from their chests while they were still alive. While the motivation for such a massive sacrifice is a subject for further research, the

archaeological evidence suggests that it was associated with massive flooding linked to a cataclysmic El Niño climatic event. Due to the excellent preservation of soft tissues in the dry coastal Andes, we use nuanced methods to reconstruct the sacrificed individuals' life histories and quality of life leading up to their execution. This paper investigates hormone production to assess systemic stress to elucidate the change in cortisol production prior to sacrifice.

**Schaefer, Jonathan (Tetra Tech Inc.)**

[176]

*Detecting Anthropogenic Earthworks in the North River Valley of Northeast Missouri via Lidar*

Lidar's utility in detecting anthropogenic topographic features, especially those occurring in forested environments, is well established within the archaeological literature. Here, lidar data produced and made publicly available by the state is utilized in the detection of earthworks within the North River Valley, a relatively small tributary of the Mississippi River located in northeast Missouri that has received little prior archaeological attention. Remote-sensing methods coupled with targeted ground truthing have resulted in the identification of over 40 newly identified conical burial mounds indicative of a sustained late Archaic–Woodland period presence in the valley.

Schaefer, Jonathan [176] see Ferguson, Jeffrey

**Schaefer, Jordan (University of Tennessee, Knoxville), Stephen Alvarez (Ancient Art Archive), Alan Cressler (Atlanta, GA) and Jan Simek (University of Tennessee, Knoxville)**

[241]

*Object-Based Image Analysis for Classifying Precontact Native American Mud Glyphs by Production Technique*

In recent years, rock art researchers have adopted a variety of automated methods that classify rock art images from high-resolution photographs and 3D models. These methods not only aid in the documentation of rock art, but can also assist with interpreting complex panels with multiple types of images represented. This paper discusses a semi-automated, GIS-based method for classifying precontact mud glyph manufacturing techniques using a high-resolution 3D photogrammetric model from southeastern North America. Through photogrammetry, it is possible to identify morphological variation between two types of mud glyphs that were produced with different artistic techniques. This information is then used to perform object-based image analysis on glyph panels, which successfully classified each glyph by the technique used to create it.

**Schalk, Randall (Cascadia Archaeology)**

[239]

*Experimental Approaches to Understanding Variability in Fire-Modified Rock Fracture Patterns*

Archaeologists have frequently conducted rock firing experiments to better understand different fracture patterns in fire-modified rock (FMR). These experiments have had varying degrees of control and their results have been difficult to interpret. This paper considers why this is the case and suggests that rock fracture involves the interaction of too many variables to achieve unambiguous results without better experimental controls. Results of a series of experiments using a ceramic kiln to specifically examine how different cooling rates produce different FMR fracture patterns are discussed. These results provide an analytical framework for interpretation of fracture patterns in a series of FMR assemblages from multiple, functionally diverse Pacific Northwest archaeological sites.

**Scharf, Elizabeth (University of North Dakota)**

[63]

*Statistical Comparison of Vegetation Trends from Pollen Records in the US Southeast*

In this presentation, vegetation changes during the late Holocene from both anthropogenic and climatic causes will be presented from several pollen coring locations in the southeast United States. These records

will be compared and contrasted, along with a summary of previous work on change over time in taxonomic evenness, richness, and diversity. Prior work has shown that there is more spatial variability in vegetation and change in diversity over time than previously discussed in the literature for this region. Greater attention in this paper will be given to the composition of taxa related to these diachronic changes with the goal of identifying the taxa that contribute most to these patterns. Specifically, principle components analysis will be used to identify which taxa or associations of taxa are driving vegetation change in different parts of the region. Given these new results, implications for local land use and cultural responses to ecological conditions will be discussed and linked to archaeological sites in the study locations.

**Scharlotta, Ian (CA ARNG)**

[53]

*Expanding Individual Life Histories to Large-Scale Dietary Comparisons of Early Neolithic Cemetery Populations at Lokomotiv and Shamanka II, Cis-Baikla, Siberia*

Reconstructing individual life histories using bio- and geochemical proxy records from 3-molar sequences of incremental dentin has elucidated a surprising degree of interpersonal variability among Early Neolithic populations in southwestern Cis-Baikal, Siberia. Previous investigations have also revealed notable differences in mortuary and dietary trends between large cemeteries on the coast of Lake Baikal (Shamanka II) and further downstream the Angara River (Lokomotiv). Examining the frequency and amplitude of shifts in isotopic data ( $^{13}\text{C}$ ,  $^{15}\text{N}$ ) in tandem with dietary reconstructions using FRUITS for arbitrary 18-month snapshots of individuals' lives permits investigation of age-specific dietary trends and helps to bridge individual- and group-level subsistence activities. Previous isotopic data have indicated protein-heavy diets that were characterized by increasing fish consumption as well as increased weaning duration through time. Particularly noteworthy are multi-annual patterns that do not fit well with routine seasonal rounds and could represent storage procedures invisible in the archaeological records of habitation sites. While present in select individuals, such patterns are not consistent in composition or frequency throughout the population, suggesting fluctuations in resource productivity forcing variability in diet-breadth subsistence strategies. This comparison of large cemeteries examines the geographic relations between cemetery locations and population life histories.

Scheffler, Timothy [150] see Dussol, Lydie

Schenk, Kristine [116] see Napora, Katharine

**Scherer, Andrew (Brown University)**

[58]

*Discussant*

**Scherer, Andrew (Brown University) and Charles Golden (Brandeis University)**

[172]

*Recent Archaeological Work in the Kingdom of Sak Tz'i' and the Santo Domingo-Lacanja Valley*

The Santo Domingo-Lacanja Valley hosted a number of small but important Classic period centers, including Bonampak, Lacanha, Plan de Ayutla, and Lacanja Tzeltal (seat of the Sak Tz'i' dynasty). It was also an important corridor of travel between the major polities of Yaxchilan, Tonina, and Palenque, among others. Here, we review the results of lidar survey of the valley coupled with ongoing archaeological research at Lacanja Tzeltal. We discuss the geopolitical reasons why, despite continuous occupation in the valley from at least Middle Preclassic into the Late or Terminal Classic periods, no major population center ever emerged within the valley.

**Schirmer, Ronald (MSU Mankato) and Andy Brown (EARTH Systems Lab, Minnesota State University)****[95]***Geophysics and Excavations at a Tribally Owned Heritage Site in the Red Wing Region, Southeastern Minnesota*

A multiyear collaborative process led to the Prairie Island Indian Community acquiring 120 contiguous acres containing two major villages and more than 90 known associated burial mounds on the north side of the Cannon River, near Red Wing, Minnesota. Archaeologists have known about the site complex for more than 140 years, but other than partial mound mapping in 1885 no archaeological investigations were conducted at the site until the current project, which started in 2019. In the last four years, we and our Tribal partners have collected multiple forms of geophysical data in an 8,000 m<sup>2</sup> area, spanning areas of levelled mounds, intact mounds, and extending into an intensively occupied habitation area. Excavation of discrete surficial and subsurface geophysical anomalies reveals that most of the site is completely undisturbed, and these site data can help resolve long-standing questions about habitation processes, occupation sequences, and intercultural interactions left unclear by excavations at other sites in the region.

**Schleher, Kari (Maxwell Museum, University of New Mexico) and Suzanne Eckert (Arizona State Museum, University of Arizona)****[86]***The Struggle Within: Effects of Spanish Interaction Intensity on Pueblo Pottery Technology as Revealed through Petrographic Study*

Spanish intrusion, colonization, and missionization impacted many aspects of life for the Pueblo people. Examination of ceramic technology provides a way to recognize cultural continuity and transformation in Pueblo communities as well as highlighting the role of Indigenous agency in determining the structure of those communities prior to and after Spanish contact. Previous research on pottery producing foragers and historic expediency helps to identify variables most likely to inform on expediency in ceramic technology during the contentious colonial period. In this study, we examine decorated pottery for evidence of potters adopting expedient ceramic technology in three types of New Mexico Pueblo communities. The Pueblo residents living in each of these communities experienced different types of contact with Spanish invaders or colonizers. At San Marcos, a Franciscan mission was established. At Piedras Marcadas, the Coronado expedition lay siege to the community and fought the Pueblo's residents. At many villages along the Rio Abajo, no missions were established. We couch our interpretations of pottery production in these communities in a framework of agency and practice to address the active role of material culture in potters' daily attempts to negotiate their place within a dramatically changing world.

Schleher, Kari [27] see Dobrov, Amanda

**Schmader, Matthew (University of New Mexico)****[215]***From Contact to Colony at the Edge of the Tiguex Province*

The first accounts of the Rio Grande Valley were made by outsiders on the Vázquez de Coronado expedition in 1540. Their descriptions regularly focused on the river valley and its associated settlements even though other surrounding areas were well settled at that time. By exploring texts written during the earliest explorations, the relationship between riverine pueblos and those located in the Sandia Mountains, its foothills, and passes such as Tijeras Canyon can be better understood as a single system and not separate geographic areas. The pueblos in the former Tiguex Province first described by Coronado, and others in nearby areas such as the Sandias, Tijeras Canyon, and other provinces to the north and south are examined in a whole context. Changes in population dynamics, village size, and reactions to the first contact and subsequent attempts at colonization and missionization are explored. Native responses, movements, resistance, and the effects of early colonial policies throughout the greater middle Rio Grande basin are discussed.

**Schmaus, Tekla (University of Pittsburgh), Bryan Hanks (University of Pittsburgh), David Reich (Harvard University), Margaret Judd (University of Pittsburgh) and Andrei Epimakhov (South Ural State University)**

[244]

*Examining Bronze Age Kinship and Community Patterning in the Southern Urals, Russian Federation, through aDNA Study*

Ancient DNA studies have increased exponentially in recent years and have had tremendous impact on our understanding of early genomic patterning in many regions of the world. The vast Eurasian steppe zone has not been overlooked in these important breakthroughs. Several recent studies from this broad region have stimulated new models for interpreting population migration and gene flow among pastoralist and agropastoralist populations. However, such studies frequently encompass large spatial territories and widely dispersed sampling. This paper, in contrast, focuses more intently on small-scale regional and subregional demographic processes relating to kinship patterning and community organization during the Bronze Age within the Southern Urals region. A detailed discussion of aDNA results from a sample of 50 individuals from the Kamennyi Ambar 5 cemetery (2100–1700 cal BCE), which is associated with the Sintashta archaeological culture, will be presented. These results offer a unique opportunity to examine more effectively ancestral heterogeneity, familial relatedness, and the biological sex of children and subadults among Bronze Age people living in the central steppes. The case study offers substantial comparative potential for examining variability in social organization and kinship patterning among early pastoralist societies in the Eurasian steppe region.

**Schmid, Viola (Leiden University), Irimi Sifogeorgaki (Leiden University), Gerrit Dusseldorp (Leiden University) and Wei Chu (Leiden University)**

[171]

*Data-Mining Quartz and Quartzite: Should We Have Standard Protocols for Measuring and Reporting on Lithic Assemblages?*

Raw materials are the lowest common denominator of any debitage analysis. And yet, the fracture mechanics of eccentric raw materials are not always fully considered when performing inter-/intra-assemblage comparisons. The fracture mechanics as one constraint to be respected by the knappers greatly influence archaeological recovery of debitage products in different raw materials. Thus, our methodologies for recording debitage morphometrics may need to be adapted to specific raw materials. This means assemblage comparison and correlation can only be attempted in a context-dependent manner. We review results of assemblages in both chert and other raw materials from a range of locations across Old World to examine how such assemblages have been recorded. In doing so, we highlight various pitfalls and limitations, and propose that it is very important to provide the contextual information and describe exactly what method was used and give arguments, why it was used.

**Schmidt, Christopher, Megan Hoffman (University of Indianapolis) and Grace Holmes (University of Manitoba)**

[104]

*Mastoid Osteoma on the Skeleton of a Known Individual from the Bethel Cemetery*

Elizabeth Poland was a member of one of the prominent families interred at the Bethel Cemetery, located in Indianapolis, IN; she died in 1896 at the age of 76. Her skeleton indicated several pathological conditions including pedal arthritis, vertebral degeneration, antemortem tooth loss, and hyperostosis frontalis interna. She also had a 3+ cm osseous growth on her parietal, superior to her mastoid process. Our objective herein is to provide paleopathological analysis and diagnosis that clarifies the severity of this prominent lesion. Our differential diagnosis focused on osteoblastic lesions including primary and metastatic neoplastic lesions (e.g., osteosarcoma, metastatic breast cancer), fibrous dysplasia, osseous venous vascular malformation, intraosseous meningioma, and osteoma. Osteoma is the most likely condition based on external and internal morphology and location. Mastoid osteomas tend to form on cranial vaults as benign outgrowths and present as sizable, egg-shaped nodules on the posterior parietal. They are a rare (~1%) but persistent idiopathic condition in ancient and extant peoples. Most mastoid osteomas produce no pain or adverse symptoms and often go undiagnosed until swelling emerges behind the ear.

Schmidt, Jordan [105] see Kardulias, Drosos

**Schmidt, Peter (University of Florida)**

[14]

*Discussant*

**Schmidt, Peter (University of Florida)**

[60]

*North American Provincialism and Outdated Archaeological Curricula: The Bane of Global Archaeology*

I was trained at Northwestern University by Stuart Struever, a student of L. Binford. I was nurtured on a positivist paradigm and force-fed like a goose on the 1960s New Archaeology. I was gratefully cured of these limitations by elders in East Africa who taught me deep respect for historical perspectives on the past. Because I and other Africanists departed from accepted positivist norms, few in North America paid heed our research and publications. We were ideological heretics and worked in an “exotic” and distant world that seemed marginal at best to North Americanists. I kept current with the latest literature in both regions, aware that to be well-informed was critical to my academic outlook, but my counterparts practiced their craft and continue to practice their craft disinterested in and oblivious to most of what is happening in African archaeology. This provincialism mimics other provincial perspectives of the American experience, manifest repeatedly in our country’s view of global affairs. Reform of archaeological curricula is long overdue, with a need to incorporate important theoretical and methodological perspectives from other world areas, including Africa. An open and brutally honest dialogue about these issues is a much-needed first step to reform.

Schmitt, Dave [203] see Edwards, Nicolette

**Schmuck, Nicholas (University of Alaska, Fairbanks)**

[96]

*Remembering the People in Peopling Narratives: Landscape Learning as a Bridge between Traditional Knowledge and Archaeology*

The debate over the Peopling of the Americas is one of grand narratives and contested archaeological evidence. The Landscape Learning Framework provides a mechanism for approaching the archaeological record at a difference scale, allowing us to rehumanize the study of population expansions in the terminal Pleistocene. Informed by a growing general understanding of the ways that humans learn unfamiliar environments, we can begin to predict how people might choose to first settle in a new land, and examine tensions between old and new “ways of doing things” in new landscapes. Disentangled from the host of implications that accompany continental-scale migration paradigms, we can more easily integrate regional archaeological analyses with Traditional Knowledge and the oral traditions of populations who have occupied these landscapes from time immemorial. In coastal southeast Alaska, pairing meaningful oral traditions with testable hypotheses generated through the landscape learning framework provides clear routes for exploring the human experience of dynamic postglacial sea-level change, despite the current shortcomings of the archaeological record.

**Schneider, Joan**

[18]

*California and Mongolia “Sister Parks” Have Common Goals: How Did That Happen?*

A partnership between Anza-Borrego Desert State Park (California) and Ikh Nart Nature Reserve (Mongolia) began in 2010 and continues through the present. Annually, a team of American archaeologists, cultural resource management specialists, and volunteers visit Ikh Nart to demonstrate and implement cultural heritage management strategies based on the California State Parks model. Working closely with our

Mongolian colleagues, great progress has been made toward promoting an ethos of recognition, recordation, protection, and preservation of cultural heritage sites within what was originally a “paper park.” Starting in 2010 with a data void, now site types, frequencies, distribution, and conditions are known. We used judgmental and random-sample pedestrian survey, installed border signage, developed bilingual interpretive signs, developed programs for local schools, and facilitated cultural tourism while encouraging cultural heritage preservation. Local herder families and townsfolk have supported these efforts through school curricula, a small museum, and law enforcement. Not a one-way effort, our Mongolian colleagues have traveled from Mongolia to California to experience how cultural preservation works in both California State Parks and National Parks systems. A robust research-focused program has recently emerged—both American and Mongolian graduate archaeologists have pursued master’s and PhDs focused on Ikh Nart.

Schneider, Larissa [17] see Cook, Duncan

**Schneider, Matthew (University of Miami)**

[49]

*In Search of the Spanish Wells: Freshwater Resources and the Florida Keys*

The Florida Keys present a unique ecological and archaeological setting in the United States, but one which has traditionally been discounted as too marginal of an environment to support year-round occupation by Indigenous communities prior to colonization. Anecdotal accounts of “Spanish Wells” reliably employed for freshwater during the colonial and early modern eras have long complicated this narrative of marginality, however. In this paper, I report on ongoing work in the first systematic effort to locate and monitor the “Spanish Wells” in order to better understand the scope of these freshwater resources. Early data validates the reliability of local ethnohistoric accounts for locating “Spanish Wells,” which have demonstrated relatively stable salinity and water levels over the course of several months. The locations and stability of these freshwater sites suggest a complex local hydro-geology, however, which is poorly understood. The stability of these sites likewise raises questions about their possible significance to wildlife, and the impact human management of them may have had in the past. Many questions remain, however continued investigation of the “Wells” may help to better inform our understanding of precolonial Indigenous habitation and subsistence to strategies in both the Florida Keys and other small island contexts.

**Schnell, Joshua (Brown University)**

[175]

*Dental Therapeutics in the Maya Region: New Evidence for Caries Manipulation and Dental Drilling*

Intentional dental modification for aesthetic purposes relating to personal ornamentation and social identity have been widely documented in the Maya region in the form of dental filing and labial drilling for dental inlays. Dental modifications for therapeutic purposes, however, are rarely documented. Though rare, evidence for chipping, scraping, and drilling in and around dental caries has been documented in European Neolithic contexts, precolonial contexts in the southwestern and southeastern United States, and in precolonial contexts in Mesoamerica and South America. These findings suggest the presence of a tradition of complex dental therapeutics in those regions. This paper reports on the first two cases of therapeutic drilling documented in the Maya region from the sites of Seibal, Guatemala and Actun Uayazba Kab, Belize. Both of these instances were observed in previously studied curated archaeological collections using high-powered digital microscopy. These findings are considered in their respective biosocial contexts and presented as important evidence for ancient Maya therapeutics, complementary to the rich tradition of aesthetic dental modification that existed in the region.

Schofield, John [155] see Manhas-Tamoria, Raveena

**Schollmeyer, Karen (Archaeology Southwest)****[199]***Chair***Schollmeyer, Karen (Archaeology Southwest), Jeffrey Ferguson (University of Missouri), Jacques Burlot (University of Missouri), Joan Brenner Coltrain (University of Utah) and Virginie Renson (University of Missouri)****[48]**

*Turkey Provisioning, Exchange, and the Isotopic Zooarchaeology of Social Transformations in the Mesa Verde Region*  
Changes in resource acquisition patterns are important components of larger social transformations, including shifts in the source areas and transport patterns of important animal resources. In the Mesa Verde region, increasing population aggregation and shifting settlement locations from AD 750 through 1225 also increased pressure on local wild and cultivated food resources, including animals. As the availability of some taxa diminished around settlements, farmers increased their use of previously rarely consumed species like domesticated turkeys, and likely relied on increasingly distant source areas for important species such as deer. Archaeological chemistry—specifically strontium, carbon, and oxygen isotope analysis—allows us to critically examine the extent to which transport of fauna took place and whether animal source areas changed over time, and assess existing arguments about localized food resource depletion and its role in social changes that culminated in widespread village depopulation by AD 1280. In this presentation, we focus on the regional exchange and maize provisioning of domesticated turkeys, including assessment of whether changes in these practices were associated with periods of resource stress and social change.

Schollmeyer, Karen [90] see Driver, Jonathan

Schollmeyer, Karen [199] see Youth, Ian

**Scholnick, Jonathan (Bucknell University)****[250]***Chair***Scholnick, Jonathan (Bucknell University)****[250]***Social Network Structure and New England Gravestone Style*

This paper examines the role of workshop organization in the emergence of shared stylistic conventions of Colonial-era Massachusetts gravestones. Deetz and Dethlefsen argued that changes in the stylistic motifs carved on New England gravestones show reflect changing attitudes toward death (1967), and that certain motifs diffuse through space and time (1965). A subset of these gravestones can be linked to individual carvers through historic records of payments and signatures carved on the stones. This study employs an archaeological network approach to analyze the decorative variation of carved gravestone motifs. Gravestone style can be analyzed at multiple scales, ranging from individual decorative elements to the motif. The social learning strategies of carvers can be identified using social network analysis techniques that were developed to identify subgroups or cliques. The results of the stylistic social network analysis are then compared with networks based on historic records of workshop co-membership and the geographic distances of these workshops, to examine underlying social learning processes that structure these network relations. These analyses have implications for the ways that geographic proximity and social network structure shape the spatial and temporal patterning of decorative styles that are widely recognized in archaeological typologies.

Scholnick, Jonathan [142] see Munson, Jessica

**Schoville, Benjamin (University of Queensland)****[170]***Unmodified Cobbles and Boulders from the Middle Stone Age Occupation of Witberg I, Southern Kalahari, South Africa*

Witberg I is an open-air Middle Stone Age (MSA) occupation within diatom-rich sediments in the southern Kalahari, suggestive of a small ancient lake system (~360,000–140,000 years-ago). The occupation horizon is dense with flakes, blades, cores, and MSA points, mostly less than 10 cm. However, there are numerous large (>25 cm) unmodified quartzite boulders associated with the artifacts that are not present in the rest of the profile. The first question asked is whether these are occurring naturally in the deposit, or if humans brought them in? And if humans brought them in, why? We conducted a systematic pedestrian survey of geogenic clasts on the landscape with the Looking At Rocks Rigorously (LARRY) method, to identify potential source locations of the clasts. A hillside 600 m west of the excavation area is a candidate; however, the purpose of the stones requires further investigation. This research is informed by Larry Todd's approach to science—first think about what natural processes are at play, collect all the data, stay busy outdoors, and include junior scientists in research. Our results point to future experiments needed on the taphonomic “disarticulation” of stacked stone structures in open semiarid environments.

**Schraub, Austin, Esequiel Ortiz (University of Texas, Austin), Amy Thompson (University of Texas, Austin), Manda Adam (University of Texas, Austin) and Fred Valdez (University of Texas, Austin)**

**[73]**

*A Geospatial Analysis of Indigenous Habitation Sites in Central Texas*

In order to properly characterize and speculate about an ancient group and their apparent subsistence strategies, it is imperative to understand the landscape and regional ecology in which the group inhabited. The widespread adoption of geographic information systems within archaeology has generated new avenues of research surrounding ancient human-environment interactions. Within Central Texas, the convergence of numerous unique physiographic regions and the vast archaeological record developed over decades of research in the region both provide a unique setting to apply this technology. This research seeks to identify and analyze the defining characteristics of habitation sites throughout Central Texas in order to predict the location of undiscovered sites and help extrapolate as to why these locations were chosen. These analyses will combine archaeological, environmental, and historical geospatial data relevant to the unique time periods and locations of previously discovered archaeological sites. From this, key determinant features of indigenous habitation sites will be identified and used to help direct future survey efforts. These insights may also contextualize past findings and contribute to a more fully developed understanding of Indigenous groups across time periods.

Schraub, Austin [73] see Ortiz, Esequiel

**Schriner, Aryn (University of Maryland)**

**[229]**

*Archaeology, History, and Accessibility with the Eckley Miners' Village Cell Phone Tour*

Established to document, preserve, and share the rich heritage of the miners and mining families that once populated Eckley Miners' Village in Luzerne County, Pennsylvania, Eckley Miners' Village Museum currently plays a pivotal role in the commemoration of anthracite mining heritage. A cell phone tour is one method the museum uses to educate the public about anthracite mining and Eckley's former residents. A recent research effort in collaboration with the museum administration determined that the cell phone tour inadequately contributed to this effort, determining the tour failed to adequately address the histories of marginalized communities at Eckley and required greater attention to visitor disability and engagement. Led by the author, this project sought to rectify these issues through an overhaul of the existing cell phone tour to ensure a more complete history is told in a more easily accessible manner. Adjustments to the tour called on data from archaeological excavations and textual analyses as well as museum engagement studies and disability studies. The incorporations of archaeological data, taken primarily from several excavations of the site in the 2010s, make this project an exemplar for public and applied archaeology.

**Schroder, Whittaker (University of Florida)****[110]***Discussant***Schroder, Whittaker (University of Florida)****[172]***Risk and Resilience in the Dynamic Lower Lacantun River Landscape*

The Maya have inhabited diverse environments in southern Mesoamerica, typified by marked seasonal contrasts between wet and dry periods. Access to water as a resource for agriculture and transportation varied spatially and seasonally for Maya communities, with scholarly and public attention often focusing on the challenges posed by extended periods of drought. In the Lower Lacantun River landscape of lowland Chiapas at the confluence with the Upper Usumacinta River, waterways presented unique opportunities and challenges to riverine communities who managed these resources. In this region, seasonal inundation of floodplains poses greater risk than periodic droughts. This paper presents recent research in the Lower Lacantun River Basin that shares a Classic to colonial period toponym of Lakamtun, known from Classic period inscriptions at sites like Piedras Negras, Yaxchilan, Bonampak, Ceibal, and El Palma, among others. The Proyecto Arqueologico Bajo Lacantun has completed two seasons of fieldwork at the primary centers of Benemerito Primera Seccion and El Palma, alongside smaller communities and agrarian landscapes, where the influence of the riverine environment has been recorded in the anthropogenic modification of the environment through settlements and drained field systems, revealed through excavation, survey, and remote sensing datasets.

**Schroeder, Bryon (Center for Big Bend Studies—Sul Ross State University)****[130]***For Fiber or Fiber: Paleoarchaic Desert Plant Baking as Calories or Raw Material?*

The West Texas–Big Bend region preserves some of the earliest examples of hot rock cooking in North America. These smaller early thermal features are thought to be the remnants of early plant baking subsistence events. Yet, work done at numerous sheltered sites in the Big Bend region preserves a remarkable perishable artifact assemblage. The foundation of this perishable technology comes from cooked and processed yuccas and agaves. The reported ratios of recovered stone to perishable tools from sheltered sites are heavily weighted toward processed desert plants. This talk offers an initial research framework to view the small Paleoarchaic thermal features of the Chihuahuan Desert as a record related to extracting fiber for tools rather than a pure subsistence pursuit.

Schroedl, Gerald [71] see Malone, Lauren

**Schulting, Rick (University of Oxford), Lucy Koster (University of Aberdeen), Andrea Czermak (University of Oxford), Gunita Zarina (University of Latvia) and Ilga Zagorska (University of Latvia)****[53]***Linking Life and Death at the Early–Mid-Holocene Hunter-Gatherer Cemetery of Zvejnieki, Latvia, Northern Europe*

The nature of the relationship between the living and the dead as seen through funerary rites is central to many aspects of archaeological interpretation. Indeed, this was the focus of early processual/ postprocessual debates, with the former seeing a “real,” if distorted, connection between the two, while the latter questioned this relationship. Human skeletal remains present the opportunity to explore the association between lived experience and treatment at death. While such connections have been identified for more sociopolitically complex societies, they have rarely been found in hunter-gatherers. Here, we present a case study from a large Early–Mid-Holocene cemetery in Latvia, northern Europe. Previous research has found that stable nitrogen isotope values are significantly lower for those individuals interred with animal tooth pendants, compared to those lacking pendants, though other grave offerings are present. We interpret this as

a community division between families placing slightly greater emphasis on hunting or fishing, respectively. Whether this reflects horizontal or vertical status differentiation is a challenging question. That those lacking grave goods entirely cluster with the “fishers” suggest that this may have been perceived as a lower status occupation, though this is complicated by the presence of some rich amber graves in this group.

Schulting, Rick [53] see Hyland, Corrie  
 Schulting, Rick [53] see Lieverse, Angela  
 Schulting, Rick [53] see Macleod, Ruairidh  
 Schulting, Rick [53] see Werens, Karolina

Schultz, JoAnna [95] see Stokes, Robert

### **Schultze, Carol (Westland Resources Inc.; CARI-Peru)**

**[22]**

*CARI-Peru Past and Future*

The Collasuyu Archaeological Research Institute (CARI-Peru) was co-founded by Chip Stanish in Puno, Peru. It remains an outstanding facility and hub for research in the region. This presentation discusses its evolution and reviews many of the important contributions to anthropological archaeology that have come from, and continue to be produced by, this group.

### **Schulz Paulsson, Bettina (University of Gothenburg)**

**[92]**

*Boat Engravings and Maritime Technologies in the Megalithic Ages 4700–2500 cal BC*

Recent research into megalithic temporality, mobility, and symbolic identity suggests that the rise of long-distance maritime journeys began in Europe as early as the megalithic era. Megaliths emerged in northwest France (~4700–4200 cal BC) and then spread over the seaways along Europe’s Atlantic and Mediterranean coasts. These discoveries prompt a radical reassessment of the early megalithic horizons and open a new scientific debate regarding the rise of seafaring and advanced maritime technologies, the mobility of megalithic societies, and the emergence of megalithic architecture among sea mammal hunting societies in northwest France. Engravings of boats and whaling sceneries are so far restricted to Brittany and suggest the central role of this region not only for the emergence and diffusion of megaliths but also for the development of maritime technologies.

### **Schumacher, Emily (University of Tulsa) and Miriam Belmaker (University of Tulsa)**

**[82]**

*Overview and Preliminary Results from the 2022 Excavation at Fort Louise Augusta, St. Croix, US Virgin Islands*

The former Danish West Indies are one of the scant examples of Scandinavian colonialism and the only example of Danish colonialism in the Americas. Although considered latecomers to the region, the Danes maintained almost continuous control of their West Indies from their initial settlement until the islands were sold to the United States in 1917. This allowed them to establish permanent settlements and construct numerous fortifications, some of which stand today. However, there have been no comprehensive studies of Danish colonial fortifications in the West Indies. On St. Croix, research and preservation efforts have focused on the prominent, bastioned forts; the minor fortifications that dotted the island’s coastline throughout the Danish period (1733–1917), including Fort Louise Augusta, have until recently been ignored. Here we present a summary of the first archaeological excavation at Fort Louise Augusta, a coastal battery located at the entrance to Christiansted Harbor in use throughout the Danish period, and discuss our preliminary results from artifact analysis and radiocarbon testing.

Schunk, Lisa [33] see Marreiros, Joao

**Schurr, Mark (University of Notre Dame), Madeleine McLeester (Dartmouth College) and Terrance Martin (Illinois State Museum)**

[140]

*Farmers of the Little Ice Age: Paradox or Enigma?*

Late Prehistoric Oneota subsistence in the North American Upper Mississippi River Valley has been described using many different and sometimes incompatible perspectives. For example, Oneota maize agriculture could be less intensive than Middle Mississippian agriculture, or more intensive. In a similar fashion, the use of wild resources, especially aquatic ones, has been interpreted as evidence for diversification or intensification. The Middle Grant Creek site (11 Wi 2739), an early seventeenth-century Huber-phase village in northeastern Illinois, provides evidence for heavy investment in maize agriculture and the cultivation of wetland soils, the exploitation of wild terrestrial plants, and the use of a wide variety of terrestrial and aquatic animals. The site shows an unusual level of maize storage and was occupied during the coldest part of the Little Ice Age, an era where upper Midwestern agriculture was seen as climate-limited. Did the inhabitants of Middle Grant Creek paradoxically increase their investment in agriculture? Or is our current knowledge of local climate and Oneota subsistence so limited that food production activities remain enigmatic?

Schurr, Mark [29] see Conly, Caitlin

**Schwartz, Christopher (EPG, a Terracon Company)**

[51]

*Scarlet Macaws and Place Making in the US Southwest and Mexican Northwest*

For over a thousand years, people living in the US Southwest and Mexican Northwest (SW/NW) acquired, raised, and kept nonlocal scarlet macaws (*Ara macao*). Although they are endemic to the neotropics of southern and eastern Mexico and Central and South America, people transported these birds over thousands of kilometers and raised them at settlements throughout the SW/NW, feeding them maize and other resources grown and procured for human consumption, and treating them like ancestors upon their deaths. In this paper, I argue that this breadth of human-animal interactions had novel and transformative impacts that extended beyond aviculture and contributed to place making in the daily lives of past people. I take a holistic approach—considering zooarchaeology, biogeochemical methods, contextual archaeological approaches, and Indigenous histories—to examine the enduring impacts of long-term human-macaw interactions.

Schwartz, Christopher [48] see Dolan, Sean

Schwartz, Christopher [48] see George, Richard

Schwartz, Christopher [72] see Peltzer, Summer

**Schwartz, Erin**

[7]

*Chair*

**Schwartz, Erin**

[7]

*Before and After (and After): Alteration, Abandonment, and Reuse of Industrial Plantation Housing*

This paper examines the multiple “afterlives” of quarters at Buffalo Forge, an antebellum iron plantation in the Shenandoah Valley of Virginia. While quarters were initially sited and constructed throughout the plantation to accommodate workers of different genders and work roles, Buffalo Forge’s cessation of iron operations in 1865 initiated new cycles of building use—first as quarters for freed individuals performing

waged agricultural labor on the former plantation, as agricultural buildings, as storage, and as several other roles over the ensuing decades. Focusing on two extant women's and family quarters (constructed ca. 1830), this paper examines patterns and strategies of alteration, abandonment, and re-use by quarter residents and others. Archaeological analysis of shifting activity areas reveals changing priorities and access to materials, while architectural and geospatial analysis illuminates differences between human, animal, and geological changes to existing structures and landscapes. While this paper focuses on Buffalo Forge, application of methods to analysis of other domestic and industrial contexts is also highlighted.

**Schwartz, Jonathan**

[191]

*Being and Becoming: Learning, Skill, and Cognition as Exhibited on Painted White Ware Pottery at Sand Canyon Pueblo (5MT765), a Pueblo III Era Community Center in Southwestern Colorado*

This paper reports on the presenter's master's thesis research which examined painted white ware vessels from the Sand Canyon Pueblo site using an adapted 18-point attribute analysis developed by Patricia Crown for determining the age and skill level of producers of painted designs of prehispanic southwestern ceramics. The thesis attempted to understand if a theorized "container metaphor" was taught by adults and learned by children by (1) verifying if the attribute analysis could be used to find "child" and "adult" pots, and (2) comparing the application of design motifs between the two categories. This paper will focus on the results of the thesis which demonstrate that childhood production can be theorized using the attribute analysis with other lines of deduction. The results further show that the attribute analysis can be usefully employed to assess a range of skills not necessarily related to youth production, as it is demonstrated that relative levels of exhibited skill in painting are tied to specific vessel forms. This paper will also discuss how the categorization between the Mesa Verde Black-on-White and McElmo Black-on-White Pueblo III pottery types may result from an implicit recognition by archaeologists of relative applied skill level.

Schwarz, Kevin [174] see Johnston, Cheryl

**Schweikart, John**

[162]

*Saving Sacred Places in Perpetuity: Research Report of Ongoing Archaeological Investigations at Vicksburg National Cemetery, Vicksburg, Mississippi*

Our national cemeteries are some of the most significant cultural properties in the United States and either by design or circumstance often exemplify our complex and at times conflicting multicultural heritage. The National Park Service manages 14 national cemeteries that are integral to the historic character, uniqueness, and solemn nature of both the cemeteries and the historical parks that they are a part of. However, these cemeteries are now facing a multitude of threats due to aging and failing infrastructure, inconsistent or harmful management practices, budgetary constraints, as well as unprecedented destruction caused by extreme weather events. In the winter of 2020, and again in 2021, Vicksburg National Cemetery (VNC) suffered from catastrophic landslides exposing and imperiling multiple United States Colored Troops (USCT) burials, gravestones, roadways, drainage systems, a potential Native American mound, a late eighteenth-century colonial Spanish outpost, and a portion of the battlefield from the 1863 Siege of Vicksburg. This presentation summarizes preliminary results from ongoing archaeological investigations of the VNC, including recent archival research, targeted application of archaeological geophysics, innovative use of historic human remains detection canines (HHRD K9s), combined with bioarchaeological analyses focused on giving personal identifications to previously unidentified USCTs.

Schwid, Maxwell [62] see Keith, Mackenzie

Schwimer, Lior [241] see Rosen, Steven

Scott, G. Richard [248] see Boyer, Cassandra

**Scott, Jenna (North Carolina State University) and Julie Wesp (North Carolina State University)**

**[124]**

*Add to Cart? The Ethical Landscape of Buying Human Bone in the United States*

This project examines the ethical landscape of the acquisition and curation of human skeletal materials for teaching purposes using the NCSU Human Skeletal Remains Collection as a case study. Lack of legislation in the United States regarding the sale of human remains, and an increase in social media, permits certain organizations and individuals to become well-known distributors in the market for skeletal material. Social media platforms provide increased exposure, broadening distributors' influence in the marketing of human remains, exacerbating the bone trade and its monetary value. Additionally, differences in the quantity and effectiveness for foreign vs. domestic human remains legislation highlights differential availability and frequency in the trade of human skeletal material, perpetuating scientific racism. Detailed analysis of the NCSU collection identified common ethical issues such as isolated bones replaced with ones from another person to sell a 'complete' skeleton, and bone disguised as art to pass through customs. While access to real bone can benefit students learning osteology, selecting "Remove from Cart" by choosing to replace real bone with cast material may be a more ethical choice given the lack of regulation regarding the bone trade in the United States. This poster contains images of human remains.

Scott, Martin [181] see Chakraborty, Kalyan Sekhar

**Scott, Michael (University of Oxford), Adam Boethius (Lund University), Rebecca Macdonald (Simon Fraser University), Michael Richards (Simon Fraser University) and Amy Styring (University of Oxford)**

**[29]**

*Using Compound Specific Isotope Analysis of Amino Acids to Distinguish Aquatic and Terrestrial Diets of Early Holocene Hunter-Gatherers in Southern Sweden*

In this study, we present the results of compound specific carbon and nitrogen isotope analysis on amino acids from bone collagen of Early Holocene humans and contemporaneous terrestrial and marine fauna recovered from multiple sites in southern Sweden. These analyses were aimed at individuals spanning the Early Mesolithic to the Middle Neolithic Pitted Ware Culture (9500–2700 BCE) to provide a high-resolution model for estimating the importance of different dietary resources at sites with differing proximities to coastlines. The application of compound specific isotope analysis in this study provided further insight into subsistence changes associated with technological improvements and increased investment in fishing, as well as the increasing salinity of the Baltic Sea during this time span, complementing data from previous isotopic analyses of bulk collagen and zooarchaeological evidence. In particular, the results of compound specific isotope analysis highlight the extent to which terrestrial versus aquatic resources were important to these Early Holocene foragers. Additionally, we examined the potential decrease in residence mobility and increased focus on local dietary resources at coastal marine-oriented sites compared to inland freshwater-oriented sites, by exploring the capability of compound specific isotope analysis for better distinguishing freshwater versus marine resource consumption.

**Scott, Stacy (Oregon Parks and Recreation Department)**

**[145]**

*Bye Bye Bye: Vanishing Shorelines and Cultural Resource Management along the Oregon Coast*

Over the past 100 years the coastline of Oregon has undergone a dramatic change as Euro-American settlement has forever altered the natural shoreline. Significant changes include placement of rip rap and forced

stabilization of naturally shifting dunes. Urban development has resulted in changes to natural movement and deposition of sediments and has altered drainage and river flows causing increased erosion of the shoreline. In addition, climate change is increasing the intensity of winter storms, sea-level rise, and higher-than-average tides that are further contributing to shoreline loss. This research paper focuses on the increase of shoreline erosion over the last 30 years and concerns related to managing cultural resource sites within this dramatically changing environment. Recorded archaeological sites are vanishing at an unprecedented rate and other unrecorded sites are becoming exposed and lost before they can be documented. Management of these nonrenewable and invaluable cultural resources must balance numerous concerns ranging from cultural sensitivity and Tribal concerns to agency priorities, which often are limited due to staffing and resource constraints. This research will develop approaches for prioritizing agency considerations for site management within the Oregon Parks and Recreation Department's north coast management district.

Seager-Boss, Fran [96] see Krasinski, Kathryn

**Sealy, Judith (University of Cape Town)**  
[166]

*Archaeological Science in Southern and Eastern Africa*

African archaeology has a rich tradition of archaeological science. Sophisticated chronostratigraphies underpin our picture of human origins; archaeometric studies of provenance, trade, and exchange are reshaping our understanding of how societies developed; and my own field of bone chemistry and paleodietary reconstruction was pioneered partly in Africa. Dave Killick has played a key role in many aspects of this. His broad research interests and his global take on issues such as the role of archaeological science in archaeology have helped to shape our field. Many students and early career scholars have benefited from his generous advice and guidance (and continue to do so). This talk will offer some thoughts on the growth of archaeological science in eastern and southern Africa, and the contribution made by Dave Killick and co-workers over the years.

Searcy, Michael [163] see Snow, Meradeth

**Sedig, Jakob (Harvard University), Esther Brielle (Harvard University), Roslyn Curry (Harvard University), David Reich (Harvard University) and Vera Tiesler (Universidad Autónoma de Yucatán)**  
[58]

*Examining the Maya Collapse through Ancient DNA*

Scholars have examined the causes and impacts of the Maya collapse for over a century, using every available line of evidence. In the last decade ancient DNA (aDNA) has proven to be a powerful tool in understanding large-scale population transformations during key time periods. This technology, however, has primarily been applied to archaeological questions about ancient Eurasia. Due to poor preservation, acquisition of ancient DNA in hot, humid places, such as the Maya region, has been extremely difficult. As of September 2022, only 25 ancient Maya genomes have been published. However, advances in ancient DNA technology have now made it possible to recover aDNA from challenging environments. This paper corrects the imbalance of aDNA research in the Maya region and explores the significant demographic events that occurred during the ninth–tenth centuries through the examination of over 300 individuals from the Maya Lowlands and Highlands, along with a coeval control population from Central America. Data from these individuals provide insight into ancient Maya familial structure, population size, inter- and intrasite population structure, and more during the Late and Terminal Classic periods. Such insights were possible only through the international collaboration of archaeologists, biological anthropologists, linguists, geneticists, students, and local communities.

Sedig, Jakob [163] see Snow, Meradeth

Sedov, Sergey [241] see Menéndez Iglesias, Beatriz

**Seibert, Michael (NPS-Fort Frederica National Monument)**  
[38]

*Discussant*

**Seibert, Michael (NPS-Fort Frederica National Monument)**  
[227]

*War of Jenkins Ear: Battle of Gully Hole Creek*

In the 280 years since July 7, 1742, the exact locations of Gully Hole Creek and Bloody Marsh have been speculated and debated without resolution until now. Fort Frederica National Monument partnered with the Frederica Baptist Church regarding private metal detecting finds found on a property near Gully Hole Creek on St. Simons Island, Georgia. National Park Service archaeologists conducted a metal detecting survey of 8 acres near Gully Hole Creek with the assistance of members from the Chattanooga Relic Hunters Association, Frederica Baptist Church, and volunteers. The project findings led to the potential discovery of the Battle of Gully Hole Creek and thereby unveiling the lost landscapes of the War of Jenkins Ear in Georgia.

**Seidemann, Ryan (Louisiana Department of Justice) and Christine Halling (Louisiana Department of Justice)**

[155]

*Disturbed Rest: The Destruction and Commemoration of an African-American Cemetery in Haughton, LA—A Collaboration of Archaeology, Ethnology, Law Enforcement, and Community*

In 2010, reports surfaced of an African-American cemetery in the northwest Louisiana hamlet of Haughton having been destroyed by a white male seeking squatters' rights on the property. Among the reported rumors were that a church and its cemetery had been bulldozed and that human remains had been dug up. Subsequent investigation of these reports by the Louisiana Department of Justice bore out the truth of many of the rumors: the remnants of a church and tombstones were bulldozed; however, the human remains were intact. In the natural gas boom of the late 2000s known as the Haynesville Shale gas play, a white male took a bulldozer to a largely abandoned African-American cemetery in order to stake a claim to potentially valuable mineral producing property. In cooperation with local police, the usurper was ejected from the property. The erasure of the visible cultural landscape (the church and tombstones) is a form of violence that is psychologically devastating to the community. This presentation reviews the difficulties involved in enforcing cemetery protection laws and how archaeology, ethnology, legal recourse, and community efforts were used to eke out a modicum of a memorial to their ancestors in the wake of devastating landscape violence.

Seidemann, Ryan [63] see Halling, Christine

Self, Caleb [49] see O'Mansky, Matt

**Seligson, Ken (California State University, Dominguez Hills)**  
[129]

*Whose Lime Is It Anyway? Burnt Lime as Commodity in the Classic Period Northern Lowlands*

Burnt lime (calcium hydroxide) has been crucial for architectural, dietary, and other purposes in Maya society since as far back as the Formative period. The recent identification of hundreds of pit-kilns used for lime production in the Puuc region of the Yucatán Peninsula allows for an investigation of the socioeconomic organization of the precolonial Maya lime industry. This paper discusses the importance of burnt lime as a commodity within Classic Maya society and presents the results of spatial analyses of the pit-kilns in relation to other archaeological and environmental features. The distribution of the lime production features suggests

that the Puuc lime industry was decentralized and organized at the small corporate group level. Some of these groups likely incorporated limestone extraction and processing into a broader multi-crafting subsistence strategy. Those small corporate groups that did not produce their own lime would have had to acquire it from producing groups through an intra-community exchange system. The paper provides a model for investigating the production and distribution of this crucial perishable material and raises questions about the valuation of lime as a commodity that existed at various points on a spectrum from necessity to luxury depending on compositional, functional, and social factors.

Seligson, Ken [176] see Parker, Evan

Sellet, Frederic [88] see Potter, Bethany

**Seltzer-Rogers, Thatcher (University of New Mexico)**  
**[161]**  
*Chair*

**Seltzer-Rogers, Thatcher (University of New Mexico)**  
**[161]**

*Between Casas Grandes and Salado: The Establishment of an Indigenous Borderland in the Ancient American Southwest / Mexican Northwest*

Whereas archaeologists continue to investigate processes of culture contact and frontier construction in hunter-gatherer and small agricultural societies using models primarily originally created and applied for ancient states and modern geopolitics, historians have recently begun investigating Indigenous borderlands. My dissertation, which includes the systematic analysis of ca. 100,000 ceramic artifacts from over a dozen major village sites, compositional analysis of said artifacts, and analysis of other forms of material culture, assesses the formation and change in what archaeologists widely perceive to be a northern extension of the Casas Grandes culture, one of the most sociopolitical complex entities in the American Southwest/Mexican Northwest. In this paper, I summarize the key results from my research with respect to new theoretical models and suggestions regarding Indigenous borderlands. In so doing, I challenge prevailing interpretations of southeastern Arizona, southwestern New Mexico, northeastern Sonora, and northwestern Chihuahua and advocate a more nuanced understanding of Indigenous power in small agricultural societies where only limited direct ethnohistoric data exist.

Seman, Spencer [3] see Buckley, Gina

**Semanko, Amanda (University of Arizona), Martin Welker (Arizona State Museum, University of Arizona) and Frank Ramos (New Mexico State University)**  
**[48]**

*Integrating Isotopic and Paleopathological Perspectives on Prehistoric Turkey Management at Turkey Creek Pueblo*  
Prehistoric inhabitants of the American Southwest and Mexican Northwest utilized domestic and wild turkeys (*Meleagris gallopavo*) for food, feathers, and ceremonial purposes. Existing archaeological studies on turkey domestication and management emphasize isotopic and genetic data, typically focusing on assemblages from the Four Corners and Chaco Canyon. We expand this discussion to the Mogollon Rim using turkey remains from Turkey Creek Pueblo in eastern Arizona. We employ data on healed fractures identified in turkey wing and leg bones coupled with preliminary carbon, nitrogen, and strontium isotopic analyses to explore wild and domestic turkey management and use.

Semanko, Amanda [245] see Welker, Martin

**Semon, Anna (American Museum of Natural History)****[27]***Documenting Miniature Ceramic Vessels in the Chaco Collection at the American Museum of Natural History*

The Chaco Collection at the American Museum of Natural History has more than 1,900 catalogued ceramic objects. Ceramic research in this collection tends to focus on the full-sized vessels, such as cylinder jars, pitchers, corrugated jars, and bowls, while less attention is given to the miniature vessels. In this poster, I present a breakdown of miniature vessel wares, construction quality and techniques, forms, and sizes. In addition, I take a brief look at the site distribution of these miniature vessels within the AMNH collection. This research helps expand our knowledge of Ancestral Pueblo ceramic production and use in the Chaco region.

Serangeli, Jordi [166] see Mentzer, Susan

**Sereno-Uribe, Juan****[26]***Architectural Conservation at Cuatlajuchitlán, an Archaeological Site in Northern Guerrero, Mexico*

One of the most successful ways in which we adapt to the environment is through the creation of architecture. This is the reflection of our aspirations and our achievements as a species; it is in architecture where we capture part of our cultural identity. In this sense, and as part of cultural identity, architecture can help us to observe and analyze the different cultural patterns that define and characterize the different groups that created it. Architecture has become one of the material elements we have to understand and analyze the communities that preceded us. What makes it vitally important to develop a good reading of both the elements it contains, as well as the spaces it delimits. During the works and conservation processes of the archaeological site of Cuatlajuchitlán, the maintenance and conservation of the architecture of the site are focused on guaranteeing the stability and continuity of each of the cultural attributes of the architecture of the site.

**Serino, Marco (University of Turin, Italy) and Eleni Hasaki (University of Arizona)****[206]***Mobilities of Potters and Pot Painters in Ancient Mediterranean: The Test Cases of Classical Athens and Southern Italy*

Movements of artists and artisans was a common phenomenon in Eastern Mediterranean both in prehistoric and historical times, with sculptors and wall painters being the most frequently mentioned in ancient texts. The mobility of makers of figured ceramics in Classical Athens and in Southern Italy has often been posited based on stylistic affinities, but not demonstrated convincingly. Our focus on how mobilities operated in Southern Italy allows us to examine a dynamic area that experienced intraregional and interregional mobility of local artists and possible relocation of Athenian pot-painters. Our four-prong interdisciplinary approach includes geographical and urban landscapes (with distribution data), visual landscapes (with stylistic and iconographic analysis), and networks landscapes (with SNA investigation of the role of seminal craft agents in the red-figure vase industry). We investigate how these different “landscapes” impacted the potters and pot-painters as they adjusted to local ceramic ecologies for shape, slips, iconography, and workshop organization. We critically revisit notions of mobilities of objects (import/export) which sometimes may be better explained as mobilities of artisans emigrating from other geographical areas and relocating in a new production center. We aim to sharpen the archaeological indicators to discern whether potters, painters, or pots moved in antiquity.

**Serneels, Vincent (University of Fribourg, Switzerland)****[166]***Iron Smelting, Stone Carving, and Pottery Production by the Early Settlers in Northeastern Madagascar: Transfer of Techniques and Local Adaptation*

The project “Stone and Iron by the Rasikajy” started in 2017, focusing on the material remains of iron smelting, soapstone carving, and pottery production in northeastern Madagascar between 700 and 1700 CE.

It is a joint project involving scholars from several universities in Switzerland and Madagascar. Four campaigns were conducted on the field, followed by archaeometric approaches. In this paper, we present several of our findings from this research. First, iron production was widespread but never reached a large scale. Smelting remained an ancillary activity based on a very simple technique. Second, in the hinterland of Vohémar, there are evidences for intensive quarrying of softstone (chloriteschist) for the production of vessels. The production line is very well established and based on advanced technology, including the use of a lathe for turning the vases. Third, pottery was made on-site at each settlement using local clays baked in open bonfire. Only at Vohémar, probably the largest and richest settlement, the pottery production has a higher level of specialization. The three different productive activities show different patterns mixing both technology transfer and local adaptation.

Serra, Margot [205] see Flammang, Amandine

Serrano Sánchez, Carlos [58] see Marengo Camacho, Nelda Issa

**Sesler, Leslie (La Plata Consultants/DCRM)**

**[151]**

*The Famous, the Infamous, and the Unknown: A Just-So Story at the Intersection of Archaeology and History in Canyon of the Ancients National Monument, Southwest Colorado*

Sometimes, archaeologists make up stories to help explain what the archaeological record is telling them.

These stories are sometimes whispered to trusted colleagues when no one important is listening.

Occasionally, these stories are made more public, and, if a person has sufficient academic capital, they might even get published. This is a “just-so” story of sorts, but with the backing of history. The story concerns the archaeological survey of a 160-acre parcel of acquired land in Yellow Jacket Canyon, within Canyon of the Ancients National Monument in southwestern Colorado. Only one site had been previously recorded within the parcel, a small Pueblo III village with an estimated 25–40 rooms and at least 10 kivas. This site and several others found during the survey are intricately interwoven with a set of historic events and intriguing historical figures, all important in their own time. Viewed through the lens of history, some were honorable, some unscrupulous, and some deplorable.

Sewnatha, Neeka [218] see deFrance, Susan

Shackley, Steven [41] see Huckell, Bruce

**Shaeffer, Megan, Charlotte Gintert (Summit Metro Parks) and Maeve Marino (University of Akron)**

**[18]**

*Every Site Is a Microcosm: A Tale of Cultural Resource Management, Public Parks, and an NRHP Site*

This presentation focuses on an Indigenous site that is on the NRHP and is located within Summit Metro Parks (SMP), a county-level park system in Ohio. Work on this site exemplifies many of the issues facing cultural resource / heritage management in a small public park system. The site spans both SMP and adjacent national park property, necessitating collaborative site management. Much of the site area has been leased for agriculture for decades, raising issues of site management, preservation, and protection from collecting/looting activity. SMP has worked in collaboration with the University of Akron to host archaeology classes and field schools at the site and to develop a multiyear program of research on the site. The resulting program, the Community Archaeology Summer Program, has been supported through grants and has provided students with essential training, helping them begin careers in archaeology. Finally, a goal of the

research is to develop more a more appropriate stewardship and interpretation strategy for this important site, hopefully in consultation with Tribal Nations and Indigenous groups.

Shai, Itzick [191] see Ross, Jon

**Shanks, Jeffrey (National Park Service)**

[225]

*Chair*

**Shanks, Jeffrey (National Park Service), Dawn Lawrence (US Forest Service) and Andrew McFeaters (Nation Park Service)**

[225]

*Reconstructing "Negro Fort": A Geophysical Investigation of the Citadel at Prospect Bluff (8FR64)*

In 1814, the British began construction of a large fort on a site known as Prospect Bluff on the Apalachicola River. There they trained a corps of Colonial Marines made up primarily of freedom seekers and maroons of African descent who fought in the War of 1812. The heart of the fort was a massive eight-sided block house, surrounded by a moat and earthworks. Post-war, the British left the Fort in the control of the maroon community that had built up around it. One of the largest free Black communities in North America at the time, Prospect Bluff became a haven for freedom seekers until its destruction in 1816 by the US military. Using historical documentation, mid-twentieth-century excavations, and ongoing geophysical survey, the architectural features of the fortifications of this National Historic Landmark are beginning to be virtually reconstructed, and new features related to the maroon occupation are being revealed.

Shanks, Jeffrey [225] see Lawrence, Dawn

**Shantry, Kate (Washington State University)**

[239]

*White Hot Polymorphs of Quartz Minerals in Archaeological and Experimental Heating Contexts*

The potential range of behaviors represented in heating stone assemblages is enormous. This paper is an attempt to identify targets for hot rock sampling and analyses that can develop our understanding of ancient global technologies in a day-to-day context. Hot rocks are ubiquitous in archaeological assemblages, yet the implications of hot rocks gleaned through counts and weights are unsatisfactory. Furthermore, focusing on hot rocks in a single feature context ignores larger-scale human choices in maintaining and maximizing an ongoing necessity for daily living. Microscopic analyses of quartz minerals in hot rocks can help archaeologists determine function as far as heating capacity. Selection of materials and potential activities can then be interpolated through sampling hot rocks to determine a material type's ability to perform desired heating tasks.

Shantry, Kate [177] see Baley, Tyler

Shapiro, Beth [94] see Oppenheimer, Jonas

**Sharp, Emily (Arizona State University) and Amanda Wissler (University of South Carolina)**

[227]

*Documenting Early Exposure to Violence and Physical Stress among Juveniles in the Late Prehispanic Andes*

Growing up during periods of chronic warfare can have long-term impacts on health and well-being across the lifecourse. Public health research has demonstrated how early exposure to violence or other physical stressors contributes to increased morbidity and mortality among children and adolescents. Within

bioarchaeology, investigating the lived experience of juveniles has broadened our knowledge of these issues in the distant past; yet, they remain understudied in some geographic regions, especially in the north-central highlands of Peru. This work presents evidence for physical violence, porotic hyperostosis, and cribra orbitalia among a sample of 54 juvenile individuals who lived during the twelfth to fifteenth centuries AD, an era known as the Late Intermediate period. Trauma results reveal nearly a quarter of juveniles in the sample sustained perimortem injuries to the cranium, with many wounds located on the posterior or inferior cranial areas. Certain cohorts of juveniles, such as those aged between 9–12 years at death, show higher prevalence of perimortem trauma, compared to other age ranges. The number of individuals with evidence of porotic hyperostosis or cribra orbitalia was relatively low, corresponding to other studies in the highland Andes. Finally, this presentation contains images of human remains.

Sharp, Emily [30] see Gabbard, Aubree

**Sharp, Kayeleigh (Northern Arizona University)**

[191]

*Chair*

**Sharp, Kayeleigh (Northern Arizona University), Carlos Osores Mendives (Pontificia Universidad Católica del Perú) and Izumi Shimada (Southern Illinois University)**

[191]

*Unrecognized Complexity: Defining the Significance of Huaca Letrada and the Northern Gallinazo*

Over the last 30 years, perspectives on the Gallinazo and Virú have changed significantly. Results of 2022 intensive surface survey and accompanying drone-based mapping of sites on the south bank of the mid-La Leche Valley show that reassessment must continue. Comparable to the monumental crafting center of Cerro Songoy-Cojal in the mid-Zaña Valley to the south, notable features of Huaca Letrada include the presence of U-shaped monumental architecture built with cane-marked adobe bricks, double-faced stone walls with filled chambers, major canals and aqueducts (or hillside water diversion walls), abundant evidence of copper working and easy access to mineral resources, and strategic location relative to north-south movement. Unlike typical findings in other valleys, however, our survey revealed a wide array of well-fired, decorated utilitarian as well as ritual ceramics that challenge the conventional notion of Gallinazo ceramics and their significance. Overall, we offer a working definition of the Northern Gallinazo polity and culture that is distinct from its southern counterpart[s] and share insights on the significance of Huaca Letrada within the broader Lambayeque region.

**Sharpe, Ashley (Smithsonian Tropical Research Institute), Richard Cooke (Smithsonian Tropical Research Institute) and Nicole Smith-Guzmán (Smithsonian Tropical Research Institute)**

[223]

*How Advances in Archaeobotany Benefit Us All: Perspectives from Zooarchaeology, Bioarchaeology, and Isotope Research*

The origin of agriculture in the American tropics drastically altered human societies and their environmental settings. Through the domestication of various plants for subsistence, medicine, and technological purposes, human populations grew and expanded at an unprecedented rate across the landscape from the Middle Holocene onward, spreading and exchanging cultivated species across two continents. Agricultural dependence on crops allowed for the development of sedentism and modification of local ecosystems. These activities affected the local flora, fauna, and even physiological aspects of the humans themselves, as health and demographics shifted in response to changing subsistence strategies. The seminal archaeobotanical work of Dolores Piperno, including her contribution to advancing both methodological and theoretical aspects of the discipline, have had profound implications for how we interpret archaeological data. Here we provide key examples of how Piperno's work has influenced interdisciplinary studies of human-environment interactions in the American tropics, from the perspective of faunal, isotope, and human osteological analyses.

Sharpe, Ashley [218] see Boileau, Arianne

Sharpe, Ashley [45] see Roa, Ian

**Shaw, Justine (College of the Redwoods)**

[77]

*Chair*

**Shaw, Justine (College of the Redwoods)**

[77]

*The Late Terminal Classic in the Cochuah Region: Neither Classic, Nor Postclassic*

Over the course of three field seasons, eight round foundation braces supporting perishable pole-and-thatch buildings were excavated in the Cochuah region of west-central Quintana Roo, Mexico. Dating to the period immediately after the region was largely abandoned during what is known as the “Maya collapse,” the structures reveal small populations living in the residential zones of larger sites and on dispersed hillocks in agricultural regions. Excavated in 50 cm quadrants, the patterning of soil chemistry and artifact distributions, as well as the varied natures of the structures themselves, reveal both struggle and resilience during what must have been a time of major social restructuring. Utilizing ceramics and lithics that had been left in other abandoned structures and suffering from at least periodic food shortages, occupants still made surprising investments in features such as plaster floors, multi-course stone walls, and burials in traditional Maya styles. This Late Terminal Classic phase is distinct from the florescent Terminal Classic time that saw the largest population ever in the region, yet also unlike the Postclassic period with its small shrines and temples dotting the landscape.

Shaw-Müller, Kyle [101] see Ellis, Olivia

Sheehan, Kevin [201] see Forest, Marion

**Sheets, Kimberly (Washington State University)**

[70]

*A Contextual Analysis of the Homol’ovi I Fauna*

In the Pueblo Southwest, ethnographies documenting Indigenous-animal interactions have been used to derive sets of expectations about how Ancestral Pueblo-animals relationships may have appeared in the past. This literature has primarily been used to predict the roles (e.g., subsistence, ritual) and depositional contexts (e.g., structure type) of animals within archaeological contexts. This poster aims to compile and test ethnographic expectations of faunal depositional contexts using zooarchaeological data generated from the faunal assemblage recovered from Homol’ovi I, a Pueblo IV period village located in northeastern Arizona. By correlating faunal composition with room type (e.g., storage rooms, ritual rooms, habitation rooms, etc.) we can gain further insight into how the deposition of taxa was structured in the past by Ancestral Pueblo peoples. Furthermore, deviations in the data from predicted patterns allow for discussion of how faunal deposition may be structured by other factors, such as room fill.

**Sheets, Payson (University of Colorado)**

[243]

*Discussant*

**Sheets, Payson (University of Colorado)**

[85]

*The Soundscape inside the Ancient Ceren Sweat Bath*

The ancient Ceren sweat bath was a communal facility of notable sophistication, especially for a commoner village. Household 2 supported its functioning with ollas full of water, pine kindling, and presumably structural maintenance. Loma Caldera’s phreatomagmatic eruption phases, with lava bombs, caused its striking

preservation. An architectural firm created a precise replica that people can enter. I noted that it fundamentally changed my voice inside, and made recordings that have been analyzed by a physicist and an acoustician. The voices of young children and mature women are not altered, just those of mature males. If this effect was deliberately engineered, it opens domains of implications, suggestions, and speculations.

Shelach-Lavi, Gideon [24] see Hanks, Bryan

**Shellenberger, Jon (Native Anthro)**

[107]

*Discussant*

Shelley, Nathan [15] see Graf, Kelly

Shelton, Kim [128] see Meier, Jacqueline

**Shelton, Rebecca (Texas Historical Commission)**

[167]

*How Texas Volunteers Protect Community Heritage*

Although there are many professional organizations practicing cultural heritage preservation, there is a group of dedicated volunteers who work tirelessly to protect their cultural heritage in Texas. For over 38 years, the Texas Archeological Stewardship Network has assisted the Texas Historical Commission (THC) in bringing public archaeology to life in their communities. The Archeology Division of THC is tasked with maintaining a public archaeology program dedicated to preserving and interpreting the vast archaeological landscape of Texas. With less than 15 archaeologists at the THC, they rely on stewards spread throughout the state. These highly skilled volunteers bring a wide array of skill sets to the network. Archaeology is multidisciplinary by nature and appeals to history buffs, cemetery guardians, museum docents, high school educators, and master naturalists. Stewards, as trusted members of their communities, assist landowners with identifying archaeological sites, abandoned towns, or lost cemeteries. Through collaboration with their county historical commissioners, they identify under-told stories and create roadside markers that keep places from becoming lost to history. Stewards spend an immense amount of time sharing their passion for archaeology and history with school children. This multigenerational approach personalizes local history and helps students to identify with their past.

Sheng, Lishuang [41] see Wang, Jiaqi

**Shenk, Mary (Pennsylvania State University)**

[142]

*Discussant*

**Sherfield, Anne (Arizona State University), Alicia Fritz (Arizona State University), Ruth Brenton (Arizona State University), Thomas Lobato (Arizona State University) and Michael Smith (Arizona State University)**

[101]

*Inter- and Intra-apartment Compound Differences in Burial Goods at Teotihuacan*

Chemical and osteological research comparing burials from different apartment compounds has found that people interred within Mazapa, Xolalpan, and La Ventilla apartment compounds have similar genetic history while people buried in Tlailotlacan held distinctly different genetic history. In this poster, we expand on this research through an analysis of inter- and intra-apartment compound differences in burial goods. The Burial Project at Arizona State University's Teotihuacan Research Lab is an undergraduate-led project that uses

published excavation reports to compile a database summarizing and coding the context, human remains, and grave goods of 823 burials at Teotihuacan. Previously we assessed the degree of variation in burial goods across the site and found little distinction. Here we fine-tune this analysis and ask whether more variation appears between apartment compounds, as suggested by previous research, than within each compound. Additionally, we ask how these burial goods may vary by the economic status associated with each household.

**Sheridan, Kelton (University of Texas, Austin)**

[10]

*Examining Indigenous Persistence and Survivance: Historical Archaeology at Mission Espada*

This paper will present preliminary data from excavations and collections analysis at the Mission Espada in San Antonio, Texas. This is part of a larger multiscale project that examines the lived experiences of Indigenous neophytes at Mission Espada and its associated ranch, Rancho de las Cabras, in eighteenth-century San Antonio. Exploring the daily lives of the Indigenous neophytes at these missions is essential to understanding how the missions functioned within the broader Spanish Empire. The second component of this project seeks to understand the effects historical narratives and conceptions of heritage have on contemporary relationships between different cultural groups in Central Texas. My paper places these two sites in Texas within the broader context of global colonial entanglements and their modern-day consequences.

**Sherman, Jason (University of Wisconsin, Milwaukee)**

[224]

*A Regional Perspective on Archaic to Formative Settlement in the Sierra Blanca Region, New Mexico*

The primary aim of the Sierra Blanca Archaeological Survey—located in the heart of the Sierra Blanca highlands of southeastern New Mexico—is to collect regional data that will enhance our understanding of settlement aggregation, community organization, intra- and interregional interactions, and ideational landscapes during prehispanic times. Data from the project complement information obtained during previous, largely site-specific investigations in the region. Systematic survey of a portion of the Rio Bonito floodplain and adjacent terraces and hillsides during the first two field seasons (2019 and 2021) identified 30 sites with prehispanic components. Evidence from these sites, as well as numerous isolated finds, allow us to make preliminary inferences about activity patterns beginning in the Late Archaic (1800 BC–AD 500); changes in the number, size, composition, and distribution of settlements during the Formative period (AD 500–1450); and long-distance trade. This paper also considers possible ecological and symbolic relationships between the region's inhabitants and elements of the natural landscape.

**Sherman, Simon (University of Memphis)**

[21]

*Nondestructive Provenance of the Watson Brake (16OU175) Lithics*

The lithic assemblage at the middle archaic (7000–4000 BP) site called Watson Brake (16OU175) has been identified visually as coming from exclusively local raw materials that are generally small, beige-to-tan gravels. These local gravel sources are found nearby the site in underlying terrace deposits and resemble those materials used by the inhabitants of Poverty Point, nearly 2,000 years later. Besides quartz crystal, sandstone and petrified wood are the only other materials found in the Watson Brake assemblage. Because of the dominance of local materials in a context that predates Poverty Point (3700–3100 BP), one might hypothesize that raw material acquisition networks emerged with the construction of earthworks at Poverty Point. This research study explores and tests previous hypotheses regarding the diversity and origin of toolstone by analytical means, in addition to identifying and examining the potential patterns of lithic network continuity during a dynamic and complex cultural period.

**Sherriff, Jenni, Boris Gasparyan (Institute of Archaeology and Ethnography, Armenia), Katie Preece (Swansea University), Mark Sier (CENIEH, Burgos, Spain) and Keith Wilkinson**

[56]

*Early Pleistocene Hominin Expansion and Landscape Evolution in the Armenian Highlands*

Understanding the chronology and environmental context of the earliest hominin expansions into Eurasia is of considerable interest in paleoanthropology. Several Early Pleistocene archaeological sites in the Armenian Highlands and wider Caucasus region have demonstrated the importance of the region for understanding the morphology of early Eurasian *Homo* and their technological capabilities. However, little is known about the broader landscapes and climatic framework in which these sites lie. Here we present findings from geoarchaeological investigations in the Debed River valley, located in the Armenian Highlands. We will first present a model of landscape evolution during the Early Pleistocene based on combined geological and chronometric study ( $^{40}\text{Ar}/^{39}\text{Ar}$  and paleomagnetism) of deposits exposed in the valley. This model will be discussed in the context of newly discovered Paleolithic sites in the valley. We will also describe preliminary results from Dzoragyugh paleolake, a 30 m thick fluvial-lacustrine sequence that is sandwiched between two basaltic lava flows. These results will be summarized in the context of the Early Pleistocene archaeological record of the Armenian Highlands and wider Caucasus region, highlighting the importance for understanding the nature and environments of early hominin expansions into Eurasia.

Sherriff, Jenni [56] see Adler, Daniel  
Sherriff, Jenni [56] see Gasparian, Boris  
Sherriff, Jenni [56] see Gill, Jayson

Sherwood, Stephanie [75] see Montero, Laurene

**Shi, Stone (UCSB MesoAmerican Research Center), Megan Kresse (UCSB MesoAmerican Research Center), Thomas Moran (UCSB MesoAmerican Research Center), Anabel Ford (UCSB MesoAmerican Research Center) and Robert Carr (Tikal Project)**  
[165]

*Modeling the Milpa at Tikal: New Dimensions of the Carr and Hazard Map*

Much debate has surrounded population and land-use strategies of the Maya. Residential settlements are accepted as a proxy for population and areas without architecture would be available for subsistence. We examine the case of Tikal, where the existing map visually describes monuments, settlements, and topography of this major Late Classic period (600–900 CE) Maya civic center. We produce a new and comprehensive 12 km<sup>2</sup> map of Tikal that incorporates details from the published 9 km<sup>2</sup> map and integrates original data from the unpublished field notebooks provided by Robert Carr. Our project digitized the architecture and contours for the 12 km<sup>2</sup> area to address questions of population and agriculture. Using GIS, we model the milpa-cycle and explore the potential of the traditional farming analogs to account for subsistence production in ancient times.

**Shichiza, Yuka (Simon Fraser University), Katsunori Takase (Hokkaido University), Hiroshi Ushiro (Hokkaido Museum), Thomas Royle (Simon Fraser University) and Dongya Yang (Simon Fraser University)**  
[163]

*Tracing Long-Term Human-Fish Interactions in Hokkaido, Japan, through Ancient DNA Analysis of Pacific Cod (*Gadus macrocephalus*) Remains*

Pacific cod (*Gadus macrocephalus*) was historically an important subsistence item for many Indigenous peoples along the North Pacific Rim including the Ainu of Hokkaido in northern Japan. However, relative to salmon, little archaeological research has been conducted on this taxon. Ethnographic records and oral traditions are also limited as many Ainu were unable to fish freely after Wajin—the ethnic majority Japanese—exercised control over the fishery in the eighteenth century. Thus, the nature of the long-term interactions between Ainu and cod remains unclear. In this paper, we investigate Pacific cod population history by conducting ancient DNA (aDNA) analysis on archaeological remains from various ancestral Ainu sites across Hokkaido that span four millennia. We sequenced variable regions of the mitochondrial genome to explore temporal changes in genetic diversity. Our research demonstrates how aDNA analysis can be used to shed light on the historical ecology of the Pacific cod and the effects of fisheries and marine environmental changes.

**Shield Chief Gover, Carlton (Indiana University; Pawnee Nation of Oklahoma), Christina Ryder (University of Colorado, Boulder), Erick Robinson (Boise State University), Kathryn Reusch (Denver Museum of Nature and Science) and Stephen Nash (Denver Museum of Nature and Science)**

[89]

*Redating the Jones-Miller Site: Multiple Hell Gap*

The Jones-Miller Bison Kill site was excavated in the early 1970s is dated to approximately 8000 BCE. The age of the site was initially represented by only four radiocarbon dates, only one of which was from the bison bone bed while the remainder came from charcoal samples associated with the site. However, questions regarding how many butchering events are represented at the site have lingered due to the presence of varying seasonality's of bison ages. Using NIR analysis, archaeologists at the Denver Museum of Nature and Science dated 27 bison mandibles, representing six age classes of bison, to determine the presence of multiple butchering events at the Jones-Miller Bison Kill site.

Shield Chief Gover, Carlton [116] see DiMarco, MacKenzie

Shield Chief Gover, Carlton [29] see Mackie, Madeline

Shillito, Lisa-Marie [235] see Blong, John

Shillito, Lisa-Marie [130] see Kingrey, Haden

**Shimada, Izumi (Southern Illinois University)**

[12]

*Sicán Political Economy: Converting Regional Productivity to Interregional Prestige Economy and Religious Eminence*

Within a matter of a few generations, during the late tenth century AD, the Middle Sicán polity with its geospatial focus in the extensive Lambayeque Complex on the north coast attained seemingly unprecedented material wealth and established an interregional sphere of trade and influence primarily along the coast of Peru and Ecuador. The truly black and lustrous *huaco rey* with its iconic representations of the Sicán Deity and Sicán Lord rapidly spread throughout much of the coast becoming a horizon style. How can we account for these developments? This paper offers an explanatory model based on combined factors of effective management of local resources, refinement and intensification of the local pyrotechnology, and strategic location. The Sicán offered Ecuadorian and Peruvian coastal neighbors superior arsenical bronze and the lustrous black ceramics that conveyed their powerful religious ideology in exchange for exotic items such as *mullus*. The prestige items in turn became the key enticement to accept the Sicán political and religious leadership.

Shimada, Izumi [191] see Sharp, Kayeleigh

**Shin, Yeonju**

[28]

*Mayan Cosmology Depicted in Ancient Murals: Understanding Gender, Death, and Religious Pedagogy in Mayan Civilization during Classical and Preclassical Era*

Research into ancient Mayan murals in San Bartolo, Bonampak, and Rio Azul demonstrates that the Mayans used paintings to educate people and to portray religious beliefs. The intricacy of their painting technique and the use of natural pigments elicit a durable, complex representation of the Mayan culture rooted in their cosmology of mystic deities called the Popol Vuh. The Mayan cosmology illustrates a concoction of good and evil residing in different realms of their world during life and death. Through detailed analyses of murals and their respective typologies in the three historical sites aforementioned, this paper explores prevalent dichotomies and ontological beliefs in Mayan communities during the classical and preclassical era. In particular, it provides insight into the Mayans' conception of gender roles rooted in astronomy, their perception of death as a spiritual resurrection of the kings, and their religious education pedagogy dominated by elites and priests.

Shinabarger, Travis [234] see Hosken, Kaitlyn

Shirar, Scott [29] see LaZar, Miranda

**Shiratori, Yuko (Kyoto University of Foreign Studies)**

[84]

Chair

**Shiratori, Yuko (Kyoto University of Foreign Studies) and Carolyn Freiwald (University of Mississippi)**

[84]

*The Historical Ecology of the Postclassic Itza Maya in Lake Petén Itzá*

The Petén lakes region, Guatemala, has a rich and diverse ecology and abundant locally available resources including terrestrial, amphibious, and aquatic animals. The Postclassic (1100–1525 CE) sites in this region are mainly located on the lakeshore, suggesting that the Postclassic people were attracted to the lakeshore location because of the rich resources of its lacustrine environment. In this paper, we explore archaeological evidence for the exploitation of animal resources, especially fish, at Nixtun-Ch'ich' on Candelaria Peninsula in Lake Petén Itzá. Recent excavation at the small Postclassic hamlet on the southern lakeshore of the peninsula encountered a Postclassic midden that contained abundant animal resources. We present preliminary findings of the analysis of fish otoliths collected from the midden through flotation, and combined with the analysis of net sinkers, explore fishing technology and procurement strategies. We also present isotopic data from a sample of mammals to consider where terrestrial game was acquired. The combined evidence suggests that the Itza Maya were actively exploiting locally available resources during the Postclassic period.

**Shiverdecker, Andrea (University of Montana)**

[155]

Chair

**Shiverdecker, Andrea (University of Montana)**

[155]

*Innovative Decolonization through Community Archaeology at the Garnet Ghost Town*

How do we ethically correct whitewashed historical interpretations and understandings of federal landscapes? By utilizing noninvasive community archaeological practices, a new understanding of the diversity and intersectionality of a turn-of-the-century Montana mining boom town is unveiled. The Garnet Ghost Town Community Archaeology Project is a collaborative research project combining the University of Montana, Bureau of Land Management's Garnet Ghost Town, and the Garnet Preservation Association. Innovative decolonization of previous understandings of Garnet utilizes boundary breaking community archaeological methods, invents new curation methodologies to address federal curation facility growing issues, and provides a framework for historical archaeological practices globally. Bringing to the forefront are the previously not represented Indigenous, African American, and Chinese diasporas of the historical Garnet community. Research into material wealth-based inequality creates multiple new understandings of how the evolutionary landscape of the Garnet Ghost Town is truly a home for ALL, will be answered.

**Shock, Myrtle (Universidade Federal do Oeste de Pará), Claide Paula Moraes (Universidade Federal do Oeste de Pará) and Manoel Fabiano Silva Santos (Universidade Federal do Oeste de Pará)**

[150]

*Amazonian Palm and Tree Fruits Fed Residents during the Pleistocene–Holocene Transition*

Thirty years after its first excavations, Caverna da Pedra Pintada continues to be one of the only sites in the Brazilian Amazon that dates to the Pleistocene–Holocene transition (over 12,000 cal BP). As such, understanding this site is pivotal to the interpretation of early human occupations and transformations of the

tropical forest. Archaeobotanical analyses of seeds and fruits from excavations conducted in 2014 have revealed a diversity of edible plants, especially palm fruits, as well as temporal variation in the resources used. We will discuss these results and how they are suggestive of modifications to perennial plants' distribution in the landscape and of how vegetation management proceeded over the Holocene.

**Short, Laura (HDR Inc.)**

[239]

*Discussant*

**Shott, Michael (University of Akron)**

[168]

*Dibble's Reduction Thesis: Its Implications for Lithic Analysis and Macroarchaeology*

Dibble demonstrated systematic effects of reduction on the size and shape of Middle Paleolithic flake tools. He identified independent (e.g., platform dimensions,) and dependent (e.g., flake mass) variables that registered the degree and pattern of reduction experienced by retouched tools. The result held implications for understanding of Middle Paleolithic assemblage variation that even now are incompletely assimilated. But Dibble's influence extended beyond the European Paleolithic. Others identified complementary reduction methods and measures (e.g., retouch and geometric indices), defined curation as a function of reduction, and developed methods to analyze reduction distributions. Today a set of methods permits comprehensive reduction analysis of archaeological assemblages and their comparison in the abstract despite the great diversity of time-space contexts. Dibble argued that many assemblages are time-averaged accumulations. In cases from New Zealand to North America, methods developed following his approach reveal the complex processes by which behavior, tool use, curation, and time interacted to yield those accumulations. We are coming to understand that the record is no mere collection of ethnographic vignettes, instead a body of data that requires macroarchaeological perspectives (sensu Perreault 2019). Archaeology's coming conceptual revolution in part is a legacy of Dibble's thought.

**Shoup, Daniel and Molly Fierer-Donaldson (Archaeological/Historical Consultants)**

[135]

*CA-ALA-11: A Middle Period Site and Cemetery on the Oakland Estuary*

This paper presents the results of recent data recovery excavations at CA-ALA-11, a coastal shell midden located on San Francisco Bay. Our excavations recovered 182 burials and 262 thermal features with dates predominantly from the Early period through Middle 2 (2500 cal BCE to 600 cal CE). The excavation sheds light on resource use, environmental change, and burial practices at a previously unknown shell mound site, contributing to our understanding of the Early and Middle periods in the San Francisco Bay region. We gratefully acknowledge the collaboration of the Confederated Villages of Lisjan, MLD Corrina Gould, and monitors Ramona and TJ Garibay.

**Shriver-Rice, Meryl (University of Miami)**

[157]

*Moderator*

Shumate, Alex [97] see Cole, Kasey

**Siegel, Peter, Emlen Meyers (SEARCH Inc.) and John Jones (Archaeological Consulting Services Ltd.)**

[46]

*Discoveries in Southeastern Bolivia Shed Light on Indigenous Cultural Dynamics of South America*

Southeastern Bolivia is one of the least-understood regions in South American archaeology. However, it is of pivotal significance in regard to Indigenous cultural history and the dynamics of cultural interactions, especially

given its location at the interface between the Andes and Amazonia. Ethnohistorically and ethnographically a large number of ethnic groups have been documented for southeastern Bolivia, including Chiquitoans and affiliated tribes, Chiriguano, Chanés, Yamparas, Sirionos, Bororos, Ayoreos, among others. Archaeological surveys and excavations were conducted in this area during construction of the Bolivian portion of the San Miguel-Cuiabá natural gas pipeline. The pipeline corridor traverses remote and sparsely populated portions of the country, which are also among the most understudied in South American archaeology. In total, 58 newly identified archaeological sites were tested, yielding over 100,000 artifacts. Excavation results, radiocarbon dates, ceramic analysis, and paleoenvironmental reconstruction fill a gap in our knowledge base for this region of South America. Project findings relate directly to late prehistoric cultural dynamics at the interface of the Andes and the Amazon and support the general model of precolumbian dispersal patterns developed by Donald W. Lathrap over 40 years ago.

Sier, Mark [56] see Adler, Daniel

Sier, Mark [56] see Sherriff, Jenni

Sifogeorgaki, Irini [159] see Dusseldorp, Gerrit

Sifogeorgaki, Irini [171] see Schmid, Viola

**Sigafoos, Rebecca (George Washington University), Jeffrey Blomster (George Washington University) and Victor Salazar Chávez (George Washington University)**

**[146]**

*Dogs, Diners, and Deposition: The Social Role of Canis lupus familiaris in Cruz B Households in Etlatongo, Nochixtlán, Oaxaca*

This paper presents a comparative faunal analysis from two distinct Early Formative households from Etlatongo, a multicomponent site located within the Nochixtlán Valley of the Mixteca Alta in Oaxaca. The faunal remains from several different contexts were analyzed; these contexts represent routine domestic refuse and those from a probable ritual deposition, most likely the remains of a feasting context. A detailed taphonomic analysis of faunal remains from these contexts reveals several differences in the handling, butchering, preparation, and consumption of the dogs, indicating a marked differential treatment of *Canis lupus familiaris* in the feasting context. We argue these taphonomic contrasts provide insights into the multifaceted social, ritual, and political role of domestic dogs in Early Formative Oaxaca. Compared with previous faunal analyses from contemporaneous contexts at Etlatongo, it becomes evident that the differential treatment of dogs constitutes part of a larger mosaic of the contrasting ways in which animals were cooked and consumed in public and domestic contexts. Our focus on early cuisines demonstrates both the social nature and the social rules for creating and consuming food at Etlatongo, as well as important changes in ontology during this time of emerging sociopolitical complexity.

Silla, Bill [59] see Martínez-Carrasco, Andrea

**Silliman, Garrett (Apogee Environmental & Archaeological)**

**[160]**

*Chair*

**Silliman, Garrett (Apogee Environmental & Archaeological)**

**[160]**

*Modeling Small-Arms Distribution on Eighteenth-Century Battle Sites*

The application of geographic information systems (GIS) technologies to archaeological investigations continues to provide new perspectives on historical events. Applied to battlefield archaeology, GIS analysis

offers an efficient means of predicting potential artifact distribution across a conflict landscape. The approach proposed in this paper allows a user to test historical engagement scenarios within a desktop computing environment utilizing a customized GIS application. The study was intended to develop a framework that allowed for the input of quantifiable parameters in order to illustrate potential artifact patterning. The framework consists of two components, the trajectory model and the methodology for implementing it. Using this coarse-grained approach, it is our contention that small-arms projectile distribution can be estimated for a single engagement, and in doing so provide a more comprehensive view of potential artifact patterning than using KOCOA (Key Terrain, Observation and Fields of Fire, Concealment and Cover, Obstacles, Avenues of Approach/Withdrawal) terrain analysis or historic research alone. Building on prior success using the 1777 Battle of Ridgefield, Connecticut, as a test case, this paper provides the hypothetical modeling of small-arms distribution for the failed 1779 Assault on Fort George (Penobscot), Maine.

**Silliman, Stephen (University of Massachusetts, Boston)**

[221]

*Discussant*

Silva, Bruno [55] see Klokler, Daniela

Silva Noelli, Francisco [132] see Sallum, Marianne

Silva Santos, Manoel Fabiano [150] see Shock, Myrtle

Silverhorn, Talon [136] see Nolan, Kevin

**Silverman, Danielle**

[123]

*Assessment of Pilgrimage Activity through Ritual Material Culture in the Anuradhapura Hinterland, Sri Lanka*

This research aims to assess whether—and if so, how—pilgrims and individuals traveling to the pilgrimage site of Anuradhapura during the Early Historic (340 BCE–200 CE), Late Historic (200 CE–600 CE), and Early Medieval (600 CE–1200 CE) periods can be represented through the deposition of ritual material culture within the hinterland. In doing so, this research adopts a methodology that prioritizes the archaeological data over textual narrative-driven interpretations. It utilizes datasets from the Coningham and Gunawardhana's (2013) Anuradhapura hinterland report for spatial and material culture analysis, as well as epigraphic remains as translated by Paranavitana (1970, 1983, 2001a, 2001b) and Ranawella (2001, 2004, 2005). An analysis of the temporal and spatial results uncover potential pilgrimage networks, hubs, and demographics, and reveal how these relationships with the Anuradhapuran center change over time and within their historical context.

**Silverstein, Jay (University of Tyumen), Sean Coughlin (Alchemies of Scent), Robert Littman (University of Hawaii) and AbdelRahman Medhat (Ministry of Antiquities)**

[126]

*A Fragrance Workshop from the Mendesian Perfume Industry at Tell Timai, Egypt*

In 2012, a salvage excavation exposed a workshop at Tell Timai, the Greco-Roman-Egyptian city of Thmouis. The workshop consisted of a parallel line of amphora bases, piping, and ovens. Adjacent to it was a hoard of coins and jewelry dating the feature to the end of the reign of Ptolemy XII and the beginning of the reign of Cleopatra VII. Thmouis was a sister to the adjacent city of Mendes which was accorded the honor of being the source of the most desired fragrances in the ancient world. New evidence indicates that, by the 29th

Dynasty, Thmouis was integrated into the economic, ritual, and political identity of Mences. Organic chemical analysis of residues found within the amphora proves that the workshop was indeed for the manufacture of a famous fragrance with sacred uses. The fragrance factory provides a unique snapshot of an industry renowned throughout the Mediterranean world through much of antiquity.

**Silvia, Zachary (Dartmouth College)**

[141]

*Pit-House Complexes: A New Form of Rural Domestic Architecture in Hellenistic and Post-Hellenistic Central Asia*

To date studies of ancient Central Asian rural architecture are marked by an imbalance with much attention focused on the estates of elite landowners and less effective nods to non-elite pithouse structures. Recent excavations at Bashtepa in the Bukhara Oasis of Uzbekistan (2021) have revealed an intermediary form of domestic architecture for the Hellenistic and post-Hellenistic period (ca. fourth century BCE–first century CE) that integrates known aspects of both elite estates and simple non-elite structures. This distinctively well-preserved house is a multiroom courtyard-style pithouse complex currently unknown to other parts of Central Asia. This paper explores some results from these excavations related to the household archaeology of the complex as well as some novel architectonic principles utilized in its construction. It explores some elements of comparison with known ancient Central Asian rural house types as well as some ideas about the anomalous appearance of this new form in the Bukhara Oasis.

Simek, Jan [241] see Schaefer, Jordan

**Simeonoff, Sarah, Marie Matsuda (ERO) and Breeanna Charolla**

[131]

*“A Masculine Occupation”: Women in CRM*

Many studies of women in the field of archaeology focus on academic institutions; however, more archaeologists are employed by the public and private sectors. In this paper, we examine the place of women holding positions in cultural resource management. By examining first-hand experiences of women in the field, we develop a picture of female archaeologists in the private and public archaeology sectors. How do intersectional identities influence women’s experiences in CRM? Do promotions and prestige differ along gendered lines? And how are women expected to enact “performative informality” in their work? Drawing on personal experiences, we offer explanations and potential solutions to disparities of female representation in the field.

**Simmons, Alan (University of Nevada, Las Vegas; Desert Research Institute, Reno)**

[135]

*The Hippos Who Would Not Die: Akrotiri Aetokremnos, Cyprus, and a Scientific Dilemma*

Akrotiri Aetokremnos, a collapsed rockshelter in Cyprus, was excavated over 30 years ago. The site caused controversy for two reasons: it was the oldest site on the island, and it was associated with extinct pygmy hippopotami. The first issue has been resolved, with over 70 radiocarbon determinations centered on 10,000 cal BC, placing the site in the late Epipaleolithic. Subsequent research has located additional sites within the same general timeframe, thereby eradicating any controversy over Aetokremnos’s age. The second issue, however, stubbornly remains contentious. We have argued that humans were instrumental in the demise of these unique island-adapted “mini-megafauna.” This relates to the highly debated global issue of humans inducing extinctions during the Pleistocene. At Aetokremnos, there are robust data from multiple lines of evidence indicating that people played a substantial role in the extinction of endemics, who likely were already stressed by the Younger Dryas. Despite this, many continue to ignore well-published data and claim that the association of humans and extinct endemic fauna at Aetokremnos is entirely specious. This attitude has persisted despite several empirical and theoretical advances in early Mediterranean archaeology. This presentation examines some reasons why the reluctance to accept robust data continues.

Simmons, Charles [142] see Crema, Enrico

**Simon, Rebecca (Colorado Department of Transportation), Rachel Egan (History Colorado; Colorado Parks & Wildlife) and Harold Henke (PAAC)**  
**[167]**

*State of Site Stewardship (or Lack Thereof) in Colorado*

Colorado's State Historic Preservation Office and Office of the State Archaeologist (OSAC) share the same building and staff, but site stewardship of archaeological sites is not consolidated in the same manner. In the summer of 2020, OSAC conducted a survey to better understand Coloradans' wants and needs regarding public archaeology, archaeology education, and outreach. The survey highlighted the Program for Avocational Archaeological Certification (PAAC), Colorado's educational program that facilitates public service and the protection of archaeological resources through education, research, and on-the-ground management. Responses from the survey indicated Coloradans are interested in and want more opportunities to participate in site stewardship. Unfortunately, OSAC doesn't actually manage any lands, just holds responsibility for cultural resources. Thus, any possibility of a statewide site stewardship program requires a substantial lift in the relationships between federal, state, and local public agencies, as well as tribal representatives, and even private landowners. This paper broadly reviews the current site stewardship programs, evaluates the place for PAAC and its in-hand resources in contrast to those that need to be developed, and considers what site stewardship looks like among different Colorado communities—local, descendant, Indigenous, and immigrant, as well as rural vs urban.

Simons, Ellyse [209] see London, Maia

Simonsen, Aka [173] see Madsen, Christian

Simonsen, Aka [173] see Nielsen, Michael

Simova, Borislava [93] see LeCount, Lisa

Simpson, St John [210] see Nash-Pye, Charlotte

Sims, Aaron [14] see Ryzewski, Krysta

**Sinclair, Anthony (University of Liverpool, UK)**

**[75]**

*The Development of Archaeology as an Interdisciplinary and Multidisciplinary Discipline 1960–2022*

Archaeology as a research activity has changed dramatically over the past 70 years. Where once archaeology might have been seen as a discipline closely related to history and classics, the introduction of new techniques from other disciplines in the sciences, social sciences, and the arts has created a discipline that now thinks of itself and its research as inherently interdisciplinary. Its practitioners are required to understand the concepts and limitations of approaches from many different perspectives, and to think creatively about how they can be best used. This poster will present a visualization of the growth and nature of interdisciplinary research in archaeology between 1970 and 2022 using bibliometric data and network-based science mapping techniques. Specifically this poster will investigate differences between (1) the disciplines from which archaeologists draw their background research, (2) the disciplinary contexts in which archaeological research is published, and (3) the range of disciplines within which archaeological research is cited. The poster will include a series of network maps that can be interrogated online by viewers at the conference and later.

**Sinensky, R. J. (University of California, Los Angeles) and Alan Farahani (Sci-Scope Solutions)**  
**[43]**

*Measurements of Archaeobotanical Diversity and Richness Using Combined Macrobotanical and Microbotanical Data: Methodological and Theoretical Considerations*

Recent computational advances in the accessibility of robust statistical techniques used to estimate the biological richness and diversity of ecological communities using observational data provide a strong foundation for archaeological assessments of botanical richness and diversity using archaeobotanical data. While there is broad consensus among paleoethnobotanists that assessments of past botanical diversity must include macrobotanical and microbotanical data, there is less agreement regarding appropriate methods for integrating these distinctive lines of evidence due to divergent taphonomies. First, we outline some of the theoretical and methodological considerations necessary to link archaeobotanical data and human behavior. Then, our analyses focus on botanical assemblages recovered from three single-component Ancestral Puebloan sites located in what is now northern Arizona (USA) dating between AD 250 and 550, inhabited by highly mobile yet intensive maize (*Zea mays*) farmers that used a wide range of foraged and cultivated plant foods alongside domesticated plant foods. We utilize incidence-based (presence/absence) sample-derived rarefaction to compare the richness and diversity of composite macrobotanical/microbotanical assemblages at scales ranging from context-specific to contemporaneous site-wide assemblages. We also introduce the application of coverage-based rarefaction to archaeobotanical data as a technique for standardizing assemblages not only by sampling effort but also by “sample completeness.”

**Singletary, Jennifer (University of South Florida) and José Peña (University of Arizona)**  
**[28]**

*Analyzing Prehispanic Textile Technology at the Site of Santo Domingo. Huarmey Valley, Peru*

This research presents an analysis of the textile technology excavated at the site of Santo Domingo, Huarmey Valley, in coastal Peru. Previous research suggests that the site was inhabited during the Late Intermediate period (AD 1150–1280). This study is accomplished primarily through the examination of the textile remains and additional perishable fiber artifacts of cordage, mats, and nets from the site. The majority of these have provenance from the burial site and therefore have a funerary relevance, however, the focus of this investigation is to describe the characteristics of these artifacts and provide quantitative data about the collection. Although only a small sample of artifacts associated with textile production was recovered, identification and additional discussion of the few tools and yarns will supplement our investigation. This analysis of the textile technology found at the site of Santo Domingo will further the understanding of the prehispanic occupation in Huarmey valley during the Late Intermediate period.

**Singleton, Robin (University of Oklahoma), Kristen Rayfield (University of Oklahoma), Karissa Hughes (University of Oklahoma), Courtney Hofman (University of Oklahoma) and La Brea Tar Pits Staff**  
**[100]**

*Prospects for the Recovery of aDNA from Asphaltic Faunal Remains*

Asphaltic deposits are a valuable source of well-preserved faunal assemblages; however, DNA extraction from such deposits has remained problematic. Harsh chemical treatments and boiling are generally used to remove asphalt from faunal material in these contexts as it does not damage the morphology; however, it may impact biomolecule preservation. Additionally, age and taphonomy likely cause preservation issues. As such, previous attempts to extract DNA from asphaltic remains have been unsuccessful. However, advancements in aDNA methodologies, in conjunction with recently excavated teeth (with minimal asphalt absorption) without the chemical treatments, make a fresh attempt feasible. Here, we attempt to extract DNA from untreated canid teeth (40,000–50,000 years old) excavated from an area of the La Brea Tar Pits that generally has less asphalt impregnation. We manually removed asphalt from remains and used high-yield laboratory methods—including sequence capture and single-stranded library preparation—to maximize the likelihood of successfully isolating canid DNA. While we were not able to definitively recover canid DNA from the asphaltic samples, this research pushes attempts to recover DNA from degraded materials forwards. Future developments in aDNA methodologies will potentially make such research more viable.

Sirak, Kendra [163] see Stark, Robert

Siurek, Alec [240] see Marojevic, Vasilije

Skaggs, Sheldon [115] see King, Adam

Skinner, Andrew [50] see Challis, Sam

Skinner, Craig [171] see Binning, Jeanne

Skinner, Dougless [15] see Hilmer, Hilary

**Skipton, Tara (University of Texas, Austin) and Jordan Davis (University of Texas, Austin)**  
**[185]**

*For Whom Are We Searching? Issues and Ethics of Maroon Site Location in the Southeastern United States*

The archaeology of maroon societies and marronage has provided crucial insight for broader studies of the African Diaspora around the world. However, few comparative approaches have addressed the southeastern United States, where marronage manifested across a multitude of environmental, historical, and sociopolitical contexts. In part, this is due to processes of erasure and dispersion that have left little information about maroons in the Southeast and where their communities were located in these ever-changing environments. As we explore the reasons for the Southeast's relatively few well-documented maroon archaeological sites, we illustrate how archaeologists have attempted to circumvent these issues using examples from Florida and southern Louisiana. However, as archaeologists both experienced in these efforts of site location, we evaluate the ethics involved in searching for these communities that were purposefully meant to stay withdrawn.

**Skowronek, Russell (University of Texas, Rio Grande Valley), Juan Gonzalez (University of Texas, Rio Grande Valley), Roseann Bacha-Garza (University of Texas, Rio Grande Valley), Christopher Miller (University of Texas, Rio Grande Valley) and Edward Gonzalez-Tennant (University of Texas, Rio Grande Valley)**  
**[181]**

*The Ancient Landscapes of South Texas Initiative and Augmented Reality: An Immersive Experience in Archaeological Education and Community Engagement*

To educate and engage the community about archaeological and geological resources available to the inhabitants of the Rio Grande Valley from Laredo to Brownsville, the Community Historical Archaeology Project with Schools Program at the University of Texas, Rio Grande Valley completed a multiyear initiative combining community engagement with the creation of TEKS-aligned lesson plans for elementary, middle, and high school students. This is a first in STEAM education pedagogy in Texas wherein locally focused research in earth and social sciences is imparted across the curriculum. One aspect of this initiative is an augmented reality (AR) enhanced poster titled, "Lower Rio Grande Valley Projectile Point Types." This educational tool highlights 65 common locally found projectile points and is organized chronologically from Paleo- to Historic. The AR components of the poster include 3D visualization of each point and a 90-second video elucidating the lifestyle and the climate of each period. The poster is printed in full color and the points are reproduced to scale to facilitate identification. The poster and related materials including a bilingual webpage, trail map, traveling exhibit, documentary film, book, and traveling educational trunks are distributed free of charge to area schools and interested community residents.

Slimak, Ludovic [122] see Drees, Svenya  
 Slimak, Ludovic [70] see Greening, Victoria

Sliwa, Jakub [28] see Palonka, Radoslaw

**Slotten, Venicia (University of California, Berkeley)**

[36]

*Chair*

**Slotten, Venicia (University of California, Berkeley)**

[36]

*Botanical Resources in Ancient Costa Rican Cloud Forests*

Paleoethnobotanical investigations at domestic contexts in Arenal, Costa Rica, reveal the plant resources utilized by past peoples living in a tropical montane cloud forest setting. Macrobotanical remains recovered through horizontal excavations of household structures at G-995 La Chiripa and G-164 Sitio Bolivar and flotation of soil samples collected from those structures demonstrate the plants incorporated into daily life as food, fuel, medicine, tools, and construction materials. Plant remains include a variety of seeds and fruits, but the plant assemblage is overwhelmingly dominated by wood charcoal that has been identified through anthracological analysis, thus illuminating the diverse arboreal resources that contributed toward domestic activities. A strong reliance on woody vegetation may have been an adaptive strategy incorporated into life in a tropical cloud forest ecosystem.

**Slovak, Nicole (Santa Rosa Junior College), Brittany Ricketts (DirectAMS), Christopher Philipp (Field Museum), Stacy Drake (Field Museum) and Patrick Ryan Williams (Field Museum)**

[162]

*Radiocarbon Dates from the Necropolis of Ancón, Peru*

The Necropolis of Ancón, Peru represents one of the largest precontact cemeteries in the Andes, with more than 3,000 burials and tens of thousands of associated grave goods excavated from the site. Despite more than a century of archaeological research at the Necropolis, not a single <sup>14</sup>C date from the burial ground has ever been published. In this paper, we present the first radiocarbon data from the Necropolis. Thirteen samples from eight Ancón funerary contexts were collected from the Field Museum of Chicago's Ancón collection and submitted to DirectAMS for radiocarbon analysis. Radiocarbon results suggest that Ancón was most heavily utilized as a cemetery during the tail end of the Middle Horizon (MH) and in the Late Intermediate period (LIP), raising questions about Ancón's role during the earlier half of the Middle Horizon. The new dates provide a refined sense of the timing and nature of human activity at Ancón and contribute to a broader understanding of chronology and mortuary traditions during the latter half of the MH and LIP along Peru's central coast. This presentation may contain images of human remains.

**Slusarska, Katarzyna (University of Szczecin)**

[251]

*Middle Age Childhood: Bioarchaeology and Health of Children from a Medieval Cemetery Site (Gz10) in Giecz, Poland*

The medieval cemetery in Giecz (site 10) is part of a complex of the early Piast state stronghold (Giecz, Greater Poland voivodeship, Poland). The cemetery is dated to the eleventh–twelfth centuries. The site has been excavated since 2014 as Slavia Field School in Mortuary Archaeology. During the seasons 2014–2021, over 150 graves have been discovered. Subadults (up to 11 years old) represent almost 50% of all individuals from the excavated part of the cemetery ( $n = 75$ ). The study examines subadults' burial rites and health, addressing two main questions: (1) Is there any relation between age and funeral practice? (2) Are pathological traits related specifically to any age group among juveniles? The age-at-death was determined based on Scheuer and Black (2000, 2004) and Schaefer et al. (2009). Preliminary analyses show that children's

graves do not differ much in ritual practice from the adult group. However, the youngest individuals are buried in simple pits without gender-related goods. The health status is described based on the following lesions: increased porosity, endocranial lesions, and subperiosteal bone production. They were selected as a symptom of physiological stress and nutritional deficits.

**Small, Marsha (Montana State University) and Jarrod Burks (Ohio Valley Archaeology Inc.)**  
[177]

*Mapping Graves at an Indian Boarding School Cemetery: Results from Chemawa in Salem, Oregon*

Indian boarding school cemeteries are a controversial issue in North America, and each comes with unique challenges. As part of the senior author's doctoral research, we recently applied, during various seasons, a range of geophysical survey and mapping techniques to the Chemawa Indian Boarding School cemetery in Salem, Oregon. Chemawa was founded in 1880 and is one of the oldest continuously in-use schools in the United States. In this paper we discuss the pluses and minuses of radar survey and show how a multi-instrument approach produced the best results in seasonal variations.

**Smeeks, Jessica (SUNY, New Paltz)**  
[161]

*Societal Boundaries and Material Production: Stylistic and Spatial Analyses of Ceramics from Late Intermediate Sites in the Huamanga Province of Peru*

Social actors interact with their material environment rather than simply reacting to it; they manipulate the meanings of, or meaningfully constitute, material culture according to their own needs and interests. As such, people use material culture to communicate and negotiate self-identity, as well as group affiliation and dissociation, and leaders can negotiate their social powers through the control of technical knowledge. The focus of this research is the dialectic relationship between society and ceramics—understanding ceramics to understand sociopolitical organization. This paper presents the final results of stylistic and spatial analyses carried out on ceramic fragments systematically recovered from 14 Late Intermediate period (LIP) (AD 1000–1450) sites in the Huamanga Province of Ayacucho, Peru. Many scholars suggest this period was marked by an initial pattern of sociopolitical decentralization followed by a period of substantial population growth and increased sociopolitical coordination in pursuit of common defense. To begin testing this interpretation, this paper evaluates the standardization and spatial patterning of pre-LIP, LIP, and post-LIP ceramic styles at the local (or site) and regional level to identify potential intrasocietal and intersocietal boundaries and define the mode(s) of ceramic production.

**Smetana, Michael (University of Alabama, Tuscaloosa), Christopher Lynn (University of Alabama, Tuscaloosa) and Marco Samadelli (EURAC Research, Institute for Mummy Studies)**  
[226]

*Medical Anthropology and Tattooing*

As the popularity of tattooing has surged worldwide, so too have studies of tattooing as a cultural and psychological practice, though research on the biological impacts of tattooing have lagged. In its basic form, tattooing is a purposeful wound on the body that leaves behind pigment and permanent meaning. Part of that meaning is the health implications of the wound, which some hold to be an injury to the body while others suggest the healing process strengthens the body. The oldest documented tattooed individual in the world, the frozen mummy nicknamed “Ötzi” for the region in which it was found, has 61 tattoos that align with acupuncture marks and appear therapeutic. How could an injury made into a permanent mark on the body be therapeutic? In this presentation, we review cross-cultural use of tattooing for therapeutic and medical purposes and our own recent studies of the physiological mechanisms by which tattooing may benefit health through affecting immune and endocrine responses. We also discuss the contrast between the stigma of tattooing and the high number of studies exploring dermatological and behavioral risk associated with tattooing and the relatively low rates of tattoo-related medical complications.

**Smiarowski, Konrad (CUNY Graduate Center)**

[173]

Chair

**Smiarowski, Konrad (CUNY Graduate Center) and Michael Nielsen (Greenland National Museum)**

[173]

*Effects of Past and Present Climate Change: Viking Age and Norse Sites in Greenland*

This presentation is one of the products of a series of ongoing interconnected, international, interdisciplinary fieldwork projects coordinated by the North Atlantic Biocultural Organization (NABO) research cooperative since 2005 in Greenland. The projects drew on more than a century of prior field research, where four generations of archaeologists described and assessed organic preservation conditions at their sites in several regions of the Norse Eastern Settlement. This created a unique form of “archaeological TEK” (Traditional Ecological Knowledge) that represents an invaluable guide into the changing preservation conditions since late nineteenth century. Between 2005 and 2022 we conducted extensive coring surveys of over 120 Norse middens, and open area and small test excavations at over 15 sites. The results show an almost complete loss of once outstanding organic preservation in a region where only 60 years ago wood, bones, leather, wool, and feathers were recovered. Our findings draw attention to the destructive process of modern climate change that has been affecting organic preservation, and to the need to organize a circumpolar-wide, international response strategy to rescue the endangered sites and their unique cultural heritage before it largely disappears.

**Smith, Benjamin (Coastal Carolina University)**

[2]

Chair

**Smith, Benjamin (Coastal Carolina University), Lucas Johnson (Far Western Anthropological Research Group Inc.) and Steven Brandt (University of Florida)**

[2]

*Imports and Outcrops: Characterizing the Baantu Obsidian Source and Artifacts from Mochena Borago Rockshelter, Wolaita, Ethiopia, Using Portable X-Ray Fluorescence*

Forty-two obsidian samples from the Baantu obsidian source, including 25 outcrop samples and 17 surface artifacts, were characterized using portable X-ray fluorescence spectroscopy. These source data were then compared to 116 obsidian artifacts from Mochena Borago Rockshelter, excavated from levels dated to >50 ka BP and ~43 ka BP. Results suggest at least three geochemical clusters present at the Baantu source: one representing local outcrops, and two deriving from as-yet unknown sources. Comparing these data to obsidian artifacts at Mochena Borago, results confirm previous analyses that local Baantu obsidian was preferred in later periods, but also reveal that Baantu obsidian was in the minority in the earliest sampled levels. These early levels preserve obsidian from as many as six as-yet unidentified sources. Comparison to published obsidian data suggests little if any procurement of obsidian from northern areas of the rift. These patterns allow archaeologists to consider the shifting scales of human and material interactions during periods when hunting and gathering peoples were dispersing not only across Africa but across the globe.

**Smith, Byron (University of Texas, Austin), Lara Sánchez-Morales (University of Texas, Austin), Samantha Krause (Texas State University), Timothy Beach (University of Texas, Austin) and Sheryl Luzzadder-Beach (University of Texas, Austin)**

[54]

*Buried Soils and Human-Environment Interactions within the Three Rivers Region of Northwest Belize*

This paper reports on recent excavations from the Birds of Paradise wetland field complex where we studied an ancient ancillary structure situated among wetland fields along the lower Rio Bravo of northwest Belize. Here we synthesize previous studies from this broader wetland field complex that includes paleobotanical

records of cultivated taxa dated to the late Terminal and early Postclassic periods. We also introduce new soil evidence for ancient Maya activity and paleoenvironmental change within this carbonate and gypsum rich floodplain. To characterize stratigraphy, we analyzed particle size distributions, soil and isotope geochemistry, and chronology through AMS dating. Our results add to the growing body of data from the Birds of Paradise that documents a shift to more C<sub>4</sub>-dominated vegetation during Maya occupation and to more C<sub>3</sub>-dominated vegetation afterward. Lastly, we document the effects of paleoenvironmental shifts and land-use change on soil formation around this ancient architecture that contained preserved wood.

Smith, Byron [236] see Beach, Timothy

Smith, Byron [236] see Clark, Morgan

Smith, Byron [236] see Landa, Yesenia

### **Smith, Claire (Flinders University)**

[14]

*Chair*

[78]

*Discussant*

### **Smith, Claire (Flinders University), Kellie Pollard (Charles Darwin University), Anita Painter (Barunga community), Maria Ortiz (Flinders University) and Andrew Coe (Charles Darwin University)**

[14]

*Turnaround Archaeology: Reorienting Archaeology So Its Main Purpose Is the Pursuit of Social Good*

This conversation is between archaeologists (both Indigenous and non-Indigenous) and Aboriginal people from the Barunga region of the Northern Territory Australia. We present our emerging vision for reorienting archaeology so its primary purpose is as a tool for social good. We discuss current research, including community-initiated and implemented repatriation, led by Anita Painter, how a community in a remote area can instigate and progress the repatriation of knowledge, photos, and objects, and Indigenous archaeology, led by Kellie Pollard, archaeology that is shaped by Indigenous ontologies, epistemologies, and aetiologies. Grounded in three decades of co-designed collaborative research and teaching with Elders from the Barunga, Beswick, and Manyallaluk Aboriginal communities in the Northern Territory, we develop Martin Nakata's notion of a third cultural space where innovation arises from the confluence of Indigenous and non-Indigenous worldviews. Our approach leads to broader questions: How can archaeology be used to address intractable social and economic challenges, such as poverty, racism, and entrenched inequality? What would happen if archaeology was used primarily as a tool to further the aspirations of communities? What would this kind of archaeology look like?

### **Smith, Emily (University of California, Santa Barbara)**

[250]

*A Quantitative Analysis of the Association between Pottery Motifs and Communal Identity during the Third Millennium BCE at Abu Fatma, Sudan*

Hinterland communities are important arenas for understanding community-level cultural and social development at the periphery of state power. In such communities where writing is not present, symbols become important vehicles for the transmission of identity information. Ceramic motif preference among individuals within these communities is one such mode of symbolic communication. Kerma, the capital of the Kingdom of Kerma (ca. 2500–1500), was a major center of power in Nubia that held significant influence along the Nile valley during the second half of the third millennium BCE. Symbolic expression was central to communication practices in Kerma culture. Elaborate ceramic motifs linked to the earliest phases of Kerma suggest that symbolic patterns were integral to displaying group affiliation and conveying social information. At the Kerma hinterlands cemetery site of Abu Fatma (ca. 2500–1500), preference for specific ceramic motifs emphasizes elements of both communal identity and familial preference for distinctive design categories within a

known symbolic system. Through the use of correspondence analysis, I argue that personalized preference within a broader symbolic landscape, deployed through ceramic motif patterning and chosen either by the family or the individual, was a factor in the distribution of ceramic designs across the Abu Fatma cemetery.

**Smith, Eric and Brian Coddig (University of Utah)**

[97]

*Dimensions, Links, and Scales in the Behavioral Ecology of Inequality*

Human Behavioral Ecology (HBE) initially focused on individual actors optimizing in a single decision category over very short time scales—"Robinson Crusoe rustles up lunch." Current and future progress in HBE entails several intertwined developments, of which we address three: (a) attending to social dimensions, by drawing on evolutionary social theory (kin selection, n-person games, signaling, etc.) as well as conventional social science (e.g., collective action, property rights); (b) linking different models, which involves careful assessment of assumptions and dynamics of each model, in order to articulate them in a theoretically coherent and productive manner; and (c) expanding time scales from behavioral and ecological to evolutionary scales. We exemplify these developments with a brief summary of research being conducted on Pacific Coast foraging societies. For (a), we discuss how institutionalized inequality is likely to arise when resources are both economically defensible and clumped. This (b) links models of territorial defense, circumscription (ideal-despotic dynamics), and collective action. However, the long lag between initial salmon exploitation and development of hereditary inequality and property rights poses (c) questions that will require the diachronic perspective of archaeological data and analysis.

**Smith, Erin (Eastern Washington University)**

[92]

*Going by Boat-Being: An Indigenous Ontological Approach to Human-Boat Relationships on the Pacific Northwest Coast*

Canoes were central to watercraft cultures in subsistence activities, in hauling people and loads, in travel and recreation, and in warfare and ceremonies. However, to many people on the Pacific Northwest Coast, canoes were viewed, understood, and experienced as much more than just boats—they were humans and other-than-humans, and homologies of other beings, things, and actions. This paper explores the multidimensionality of human-boat relationships, to include other ways in which people used, thought, and interacted with boats, and how boats shaped human worlds. Centering canoes within the context of ontologies not only allows for new interpretations of the archaeological record but also contributes to the current Indigenous Movement in which canoes are a significant part of Indigenous resurgence, cultural revitalization, community healing, and the enrichment of Tribal identities.

**Smith, Fred (Illinois State University)**

[47]

*Discussant*

Smith, Geoffrey [64] see Bradley, Erica

Smith, Geoffrey [130] see Kingrey, Haden

Smith, Geoffrey [21] see Saper, Shelby

**Smith, Gerad (University of Alaska, Fairbanks)**

[147]

*Exploring the Antiquity of the Dene Potlatch in Interior Alaska*

The Pickupsticks site in the Shaw Creek Flats of the Middle Tanana Valley region of interior Alaska represents a short-term ceremonial occupation site of the early Dene tradition (~930 rcybp). In 2010, the

remains of a large structural feature were identified there. Intermittent excavations over the following decade confirmed the structural remains were identical to traditional Alaska Native houses described from the nearby Goodpaster River village. However, numerous lines of evidence suggest short-term use. This paper will describe the analytical results that strongly indicate the structure was intended and used for a single event rather than for long-term residential behaviors. We interpret that event to have likely been a traditional regional potlatch, the oldest definitive archaeological evidence of such a ceremony yet observed.

Smith, Gerad [15] see Crass, Barbara  
Smith, Gerad [15] see Lanoë, François

**Smith, Heather (Texas State University)**

**[33]**

*Paleoindian Lifeways Set in Stone: Studying Variation in Fluted-Point Assemblages*

Several studies have found variation in fluted-point technological attributes and morphology to be patterned in the Americas. Many of these patterns can be organized by geographical, ecological, and behavioral variables, and have helped formulate our current understanding of some of the earliest cultures to live in the Western Hemisphere. This paper will review how researchers have assessed patterns in fluted-point variation and supported, refuted, and developed new hypotheses explaining Paleoindian lifeways, as well as factors limiting the utility of such studies. We will consider hypotheses, such as cultural transmission and cultural drift, that researchers have proposed to explain patterns in fluted-point variability organized geographically in large, continent-scale datasets, and discuss the kinds and nature of data necessary for testing these hypotheses. The goal of this exercise is to open a dialogue on tangible approaches archaeologists may take as the next step in understanding the meaning of variation in North American fluted-point assemblages.

**Smith, J. Gregory (Northwest College)**

**[129]**

*Chair*

**Smith, J. Gregory (Northwest College) and Alejandra Alonso Olvera (INAH)**

**[129]**

*Crafting Chert Commodities at Santa Cruz, Yucatan, Mexico*

This paper discusses chert crafting at the site of Santa Cruz in northern Yucatan. Santa Cruz was a small town located only about 25 km from both Chichen Itza and Ek Balam and occupied almost exclusively during the Late/Terminal Classic period when both these cities were at their height. Surface collections in 2017 and test-pitting in 2022 has resulted in the documentation of chert crafting at discrete locations at Santa Cruz. An analysis of the chert assemblage has revealed abundant flakes, utilized flakes, and various tool types. We consider several different models that help interpret how chert crafting was organized at Santa Cruz. We also touch on possible reasons why there is obvious evidence of chert commodity crafting at Santa Cruz but less evidence of this at Chichen Itza and Ek Balam.

**Smith, Jaye (Council of Allied Societies) and Jeffery Clark (Archaeology Southwest)**

**[229]**

*Continued Work on the Ray Robinson Collection: Four Salado Sites in the Northern San Pedro Valley Region of Southeastern Arizona*

As investigations continue into the Ray Robinson Collection by Archaeology Southwest's dedicated team of volunteer researchers, attention now turns to assemblages collected by Robinson in the northern San Pedro Valley (and vicinity) of southeastern Arizona. During Ray's consulting work for mining companies in the area, he documented four sites near the present-day towns of Kearny, Winkelman, and Mammoth. Using Ray's extensive field notes and other available historical information, our research indicates that three of these sites might have been professionally recorded after Ray visited them. Most notable is the Smith Wash site

(AZ BB:1:3 ASM), a late Salado room block of 50–75 structures located west of the Gila-San Pedro confluence. We have also tentatively linked two other sites in this collection with professionally recorded sites along the San Pedro that date to the Salado period (fourteenth century CE). The fourth Salado site (Mustang), at the San Pedro-Gila confluence, is currently beneath mine tailings and to our knowledge has not been professionally recorded. This paper will share the results of the documentary research conducted on each of the Robinson site locations and present a detailed inventory of the artifact assemblages from each including ceramic typological and obsidian sourcing analyses.

**Smith, Kyra (Boston University)**

[122]

*The Archaeology of Public Health and Food Sovereignty in the Pacific Islands*

Colonialism has had significant influences on lifeways across the South Pacific, including health and diet in the past and today. Colonially introduced diets have caused a loss of traditional food practices, created cultural power dynamics, and have led to contemporary public health issues. These colonial legacies not only have continued impacts on the health of islanders in the Pacific, and those in the global diaspora, but the cultural identity and economics of these islands as well. Archaeological data are critical in addressing contemporary public health issues because they can be used to understand past foodways and cultural practices, which may have been lost. By understanding colonial entanglements in traditional diets from the initial settlement of the islands to modern populations we stand to further understand the ways in which food sovereignty and cultural compromise shape past and present foodways.

**Smith, Micah (Texas Parks & Wildlife Department), Tim Gibbs (Texas Parks & Wildlife Department) and Tim Roberts (Texas Parks & Wildlife Department)**

[45]

*Juntando La Junta: Bringing Together Ceramics Research in the La Junta Region of West Texas*

The La Junta de los Ríos (or La Junta) region of West Texas and Northeast Chihuahua is composed of villages scattered around the confluence of the Rio Conchos and Rio Grande. Based on limited investigations, La Junta village sites (AD 1200–1684) appear to be archaeologically similar to, yet distinct from, adjacent Mogollon groups. While the region has been historically understudied, renewed scholarship provides new opportunities to reappraise this region and its relationships with surrounding cultural groups. The growing body of ceramic collections from La Junta provides opportunities to employ quantitative methods to develop compositional profiles that provide a means to evaluate manufacture locales and patterns of trade. The present study combines published instrumental neutron activation analysis (INAA) and petrographic results with new data from archaeological sites within Big Bend Ranch State Park to provide an updated summary of regional ceramic trends. The results illuminate aspects of the local economy of La Junta, as well as broader patterns of regional interaction and exchange.

**Smith, Michael (Arizona State University)**

[142]

*Discussant*

**Smith, Michael (Arizona State University)**

[26]

*Urban Life in the Distant Past: A New Approach to Early Urbanism*

I describe a new approach to understanding life and social dynamics in premodern cities around the world. Early cities varied considerably in their political and economic organization and dynamics. My approach is transdisciplinary in scope, scientific in epistemology, and anchored in the urban literature of the social sciences. The central concept is “energized crowding,” an idea that captures the consequences of social interactions within the built environment that result from increases in population size and density. I explore the implications of features such as empires, states, markets, households, and neighborhoods for urban life

and society. Direct influences on urban life—as mediated by energized crowding—can be organized into institutional (top-down) forces and generative (bottom-up) processes. I discuss similarities and differences with contemporary cities, and highlight the relevance of ancient cities for understanding urbanism and its challenges today.

Smith, Michael [101] see Sherfield, Anne

**Smith, Monica (UCLA)**

[213]

*From City Walls to Country Forts: Changing Landscape Intentions of Social Complexity from the Early Historic to Medieval Eras in the Indian Subcontinent*

Walled cities and rural fortifications both represent investments in place-making for warfare but are differentially conceptualized and used. Urban walls encircle noncombatants with an everyday monumentality that also serves as an economic, social, and ideological perimeter, with constructions often overdesigned relative to strategic or tactical utility. Rural fortifications are created to serve as staging-points for territorial advance or retreat, but often are located in challenging topographies where strategic advantage must be supported by long supply chains. Cities would seem to be better prizes in warfare, and urban walls would seem to be the most efficient form of warfare planning; nonetheless, the fact that no city in the world today has defensive walls suggests that expansive territorial control and military investment have superseded the seizure of compact urban locations of population and resources. When and why did the concept of a fortified landscape become a viable political strategy for territorial consolidation compared to the simple defense or capture of population nodes? In this paper, I evaluate the shift in South Asian political strategies from walled cities in the Early Historic period (ca. third century BCE–fourth century CE) to rural forts in the Medieval period (ninth–sixteenth centuries CE).

**Smith, Morgan (University of Tennessee, Chattanooga)**

[197]

*Chair*

**Smith, Morgan (University of Tennessee, Chattanooga) and Shawn Joy (Archaeological Research Cooperative)**

[197]

*Lithic Technological Organization at 8JE1796: A Perspective from Apalachee Bay, Florida*

Lithic technological organization (LTO) approaches are used to understand how stone tool making societies provision themselves with regard to raw material in a given environment. How societies provision themselves provides insight into their adaptive strategies for a landscape. 8JE1796, Clint's Scallop Hole, is a quarry located ~8 km offshore in the Gulf of Mexico and is part of a broader inundated landscape containing short-term campsites, quarries, and basecamps. The site was inundated by ~5000 cal BP, providing a useful time constraint on access to the site. This poster will show results from a full LTO analysis of the 8JE1796 lithic assemblage and compare these data with other sites in Apalachee Bay to better understand indigenous use of this landscape through prehistory.

**Smith, Ryan (University of Pittsburgh)**

[176]

*Early Settlements and Networks of the Formative South-Central Andes: Sunken-Court Distribution and Variation through Systematic Imagery Survey and Targeted Ground-Checking*

By the Middle Formative period (1000–500 BCE), the first permanent architecture appears along the shores of Lake Titicaca in the form of sunken, semi-subterranean courts. These were centers of important public and religious activities and are indicative of emergent forms of permanent political leadership and hierarchies. Thanks to their monumental size, these features are highly visible in the archaeological landscape. Sunken

courts have been reported across much of the Titicaca Basin, yet most of what we know about them is limited to excavations at larger sites. This poster reports preliminary results from a systematic satellite survey of sunken courts in the northern Titicaca Basin and adjacent eastern valleys of southern Peru, covering a total area of 17,000 km<sup>2</sup>. Survey methods and characteristics of sites captured in the study are first reported, followed by an analysis of regional patterns. Results focus on the distribution of several previously unreported sunken courts whose distribution along key corridors of movement suggest a well-established network connecting populations of the Titicaca Basin and the eastern valleys.

**Smith, Scott (Franklin & Marshall College), Elizabeth Klarich (Smith College) and Andrew Roddick (McMaster University)**

**[164]**

*Beyond Sunken Courts: Jerry Moore's Influence on Lake Titicaca Basin Archaeology*

Through both his research and mentorship Jerry Moore has had a profound effect on the development of studies of landscapes and built environments in the Lake Titicaca basin. His own investigations have advanced our understanding of ritual interaction in the paradigmatic public spaces of the region: sunken courts. In addition to this, however, Moore's theoretical insights and analytical frameworks have inspired a number of other approaches to understanding regional built environments. In this paper, we review Moore's direct contributions to understanding Titicaca basin archaeology and also explore the ways his insights have served as a foundation for investigations into the importance of place to past social dynamics in the Lake Titicaca basin.

Smith-Guzmán, Nicole [223] see Sharpe, Ashley

Snider, Ben [54] see Eshleman, Sara

**Snitker, Grant (Cultural Resource Sciences Program, New Mexico Consortium), Sean Bergin (Arizona State University), Jonathan Paige (Arizona State University) and Anna Jansson (USDA Forest Service, Okanogan-Wenatchee National Forest)**

**[150]**

*Exploring High-Elevation Social-Ecological Relationships through Two Pilot Field Seasons of the Central Cascades Alpine Land-Use and Fire History Project*

Precontact archaeology in Washington State's Central Cascades is not well studied due to the region's remote location and perception as a marginal area separating cultural centers in the western and eastern portions of the state. Recent research in the adjacent North and South Cascades (i.e., North Cascades National Park and Mt. Rainier National Park) has revealed that subalpine ecozones contain a long and rich cultural history spanning much of the Holocene, but similar investigations are lacking in the Central Cascades. Therefore, this project aims to evaluate the spatial distribution and chronology of land-use in the Central Cascades to understand how precontact land management practices may have contributed to the ecological diversity now seen in high elevations. We present results from two pilot seasons of archaeological survey and paleoecological sampling on Kachess Ridge and the Alpine Lakes Wilderness within the Okanogan-Wenatchee National Forest. We discuss the challenges of working in these remote areas, the results of our data collection efforts, and our vision for the future of this project. We anticipate that this work will help fill in large gaps in our understanding of regional culture history, as well inform theories regarding human impact of these unique and overlooked ecological zones.

Snoeck, Christophe [53] see Werens, Karolina

**Snow, Meradeth (University of Montana)****[163]**

Chair

**Snow, Meradeth (University of Montana), Michael Searcy (Brigham Young University), Jakob Sedig (Harvard Medical School) and José Luis Punzo Díaz (Instituto Nacional de Antropología e Historia)****[163]***Genomic Data from Paquimé: Understanding the Cultural and Genetic Ties of the Site*

Paquimé, located in the Casas Grandes region of Northern Mexico, presents a rich cultural tradition with ties to populations to the South and North. Ancient mitochondrial DNA from Paquime's occupants has not provided evidence of large-scale in-migration that led to the florescence of the site, as some scholars have hypothesized. This paper focuses on nuclear genomes that have been sequenced for 20+ Paquimé individuals, further demonstrating the complexity of the region and of the city. The emerging data (collected with approval from the Mexican Consejo de Arqueología) presents a clearer view both of the population's genetic relationships with those to the North and South, and uniqueness in their own right. Intra-site variability, when approached from the different interment types, also demonstrates that the occupants of Paquimé were not culturally homogeneous in comparison to their neighbors, although there are some striking similarities. This project also highlights the benefits of international collaboration, and how researchers with different expertise can learn from each other and local communities.

Snow, Meradeth [102] see Gutiérrez Ruano, Patricio

Snow, Meradeth [45] see McDonald, Holli

**Snyder, Madeline****[183]***Ties to the Ancestors: Examining a Late Classic Household at Las Ruinas de Arenal, Belize*

There has been a long history of settlement and household archaeology in the Belize River valley that has added significantly to our understanding of everyday people in the Maya lowlands. Recent studies that include lidar provide a broader landscape perspective. Lidar can also be useful in determining labor investment in domestic architecture through volumetric analysis, thus allowing for comparisons between households for a more fine-grained understanding of possible social distinctions based on access to materials and labor. Although volumetric analyses are insightful, these analyses need to be coupled with intensive excavation data to provide a more nuanced understanding of the social landscape. Furthermore, it is important to consider the placement of the household in relation to other key natural and architectural features, such as nearby ceremonial buildings. In this paper, I present new data from a Late Classic household at Las Ruinas de Arenal, Belize. This household was built just southeast of the site's Preclassic ballcourt and E Group complex. Although research on this group is ongoing, preliminary data from volumetric analysis and excavations suggest that this non-elite household may have held a more privileged status within the larger Las Ruinas de Arenal community.

**Snyder, Thomas (University of California, Davis) and Randy Haas (Wayne State University)****[160]***Climate Change Intensifies Violence in the South Central Andean Highlands, 1.5–0.5 ka*

The archaeology of the precolumbian Andes provides an ideal study of the range of human responses to climate change given the region's extreme climatic variability, excellent archaeological preservation, and robust paleoclimate records. We evaluate the effects of climate change on the frequency of interpersonal violence in the south central Andes from 470–1540 CE. To do this, we compile published bioarchaeological literature from 2753 human crania in order to identify incidents of interpersonal violence. A series of generalized linear mixed models reveal that for each meter of decrease in ice accumulation at the Quelccaya glacier—our proxy for regional precipitation—the log-odds of a highlander experiencing an archaeologically

detectable instance of interpersonal violence increased by 8.91. In contrast, regional precipitation had no detectable impact on interpersonal violence among low and mid-elevation populations. We suggest that this disparity resulted from variable economic conditions and sociopolitical strategies at different elevations. The dissolution of organizing polities in the Andes and reliance on rain-fed agriculture may have predisposed highland populations to violent competition over resources during climatic downturns. Conversely, lowland and midland populations may have relied on a greater diversity of resources that were less vulnerable to drought.

Sobel, Elizabeth [7] see Worman, F. Scott

Soergel, Allison [102] see Wampler, Marc

Solis, Gabriela [172] see Ruiz, Judith

**Solis, Kristina (University of Texas, San Antonio), Mary Whisenhunt (University of Texas, San Antonio), Robert Hard (University of Texas, San Antonio), Jacob Freeman (Utah State University) and Raymond Mauldin (University of Texas, San Antonio)**  
[198]

*Morhiss and Buckeye Knoll Cemetery Sites: A Comparison of Hunter-Gatherer Mortuary Chronologies and Traditions*  
Located on the Guadalupe River in Victoria County, Texas, Morhiss (41VT1) and Buckeye Knoll (41VT98) represent two of the oldest and largest hunter-gatherer cemeteries in the United States. Recent accelerator mass spectrometry (AMS) dating of 90 burials at the Morhiss site offers unique insights into its mortuary complex. AMS dates suggest Morhiss was in use from the Early Archaic (9000–6000 BP) to the Late Prehistoric I period (1150–700 BP). Morhiss is associated with one of the most extensive shell assemblages in the Texas coastal region, including marine shell ornaments, beads, and tools. Buckeye Knoll, on the other hand, was in use primarily in the Early Archaic, but has burials extending into the Late Archaic (4000–1200 BP). Buckeye Knoll's burials are associated with elaborate ground and chipped stone artifacts, as well as some marine shell ornaments. In this poster, we compare Morhiss with Buckeye Knoll, both representing rare cases of long-term mortuary sites situated on the Texas Coastal Plain. We evaluate the chronological distributions of burials at both sites and compare long-term patterns in burial populations, as well as associated mortuary assemblages.

**Somerville, Andrew (Iowa State University), Isabel Casar (Universidad Nacional Autónoma de México) and Pedro Morales (Universidad Nacional Autónoma de México)**  
[20]

*The Adoption of Agriculture in the Tehuacan Valley, Mexico: Stable Isotope Data for 10,000 Years of Environmental and Dietary Change*

An enduring focus in anthropological research concerns the causes for adoption of agriculture in multiple regions across the globe near the onset of the Holocene. The Tehuacan Valley of Puebla, Mexico, represents a unique location to explore long-term trends of human-plant coevolution as the dry climate of the valley has resulted in preservation of organic materials dating from the late Pleistocene through the Holocene. To explore the notion that environmental changes stimulated the adoption of agriculture, we use stable isotope analysis of human and animal bones that span a 10,000-year period. The study includes 37 human samples and 200 faunal bone remains, including 20 dogs (*Canis familiaris*), 79 white-tail deer (*Odocoileus virginianus*), and 101 lagomorphs (*Sylvilagus* spp. and *Lepus* spp.). The human data reflect dietary patterns over time while the faunal data reflect environmental conditions. Results demonstrate significant environmental changes from the Pleistocene to the Holocene, but also significant environmental changes within the Holocene. Maize consumption by both humans and dogs increased from the Ajalpan (~1500–900 BC) to Venta Salada (AD

700–1500) phases, but little evidence exists for regular maize consumption prior to this time. Results are situated within local and global discussions on the development of agricultural economies.

Somerville, Andrew [100] see Webster, Serena

Sonet, Gontran [163] see Suarez Gonzalez, Nathalie

**Song, Hyeonsoo (Ilyoung Cultural Heritage Research Institute)**

**[220]**

*Shell Midden Formation and Occupants during the Tamna Period (Third to Tenth Century CE) on Jeju Island*

This study investigates relationships between shell middens and residential sites during the Tamna era (third–tenth century CE) on Jeju Island. The occupation evidence of the Tamna polity can be found along the northern areas from the Halla Mountain. Near the Gwakji shell midden in the northwest, we recovered several residential sites of the shell midden creators, and this stands in contrast to the Jongdalri shell midden in the northeast, where we have not recovered residential sites. Since shell middens are understood to be formed over a long period, the midden creators or the site occupants likely resided nearby. This presentation examines on the possible reasons of this difference between the two sites that are otherwise similar in other several characteristics. Artifacts, ecofacts, and archaeological features are compared to examine how the site users stayed, moved, and lived along the site areas.

**Soressi, Marie (Leiden University)**

**[159]**

*Chair*

**Soressi, Marie (Leiden University), Vera Aldeias (Universidade do Algarve), Wei Chu (Leiden University), Leonardo Carmignani (Leiden University) and Igor Djakovic (Leiden University)**

**[159]**

*Profiling the Past: About the Importance of Excavating Side View and Sieving with a Small Mesh for Retrieving Blade/Bladelet Production in Middle Paleolithic and Early Upper Paleolithic Contexts*

Excavation involves working both in side-view (i.e., with profiles), to recognize the stratigraphy, and in plan-view to excavate features and layers. Here we want to elaborate on the advantages of working mainly in side-view at Paleolithic sites with long, complex stratigraphies with high find densities. Sieving is known to be crucial for the recovery of smaller finds, including micro-blades, micro-points, and bladelets. However, among European Middle Paleolithic excavations, sieving with a mesh smaller than 5 mm is not always done. Recent analysis of micro-lithics recovered from the 1, 2, and 4 mm sieve mesh in European Middle Paleolithic context show the importance of small mesh sieving to better document and reconstruct micro-debitage production and use in the deep past.

**Sorresso, Dominique (University of Florida)**

**[86]**

*Chair*

**Sorresso, Dominique (University of Florida), C. Trevor Duke (Clemson University) and Charles Cobb (Florida Museum of Natural History)**

**[86]**

*Identifying Potting Traditions from the Nashville Basin through Ceramic Petrography*

This paper aims to investigate ceramic manufacturing in the Nashville Basin of Tennessee during the Mississippian period (AD 1000–1500) at the macroscopic and microscopic levels. Our vessel lot and petrographic studies analyze 73 shell-tempered pottery sherds from seven Middle Cumberland archaeological

sites. We utilize form and function information, point-counting data, and qualitative observations in thin-section to examine the chain of operations used to create these vessels. While this study aims to investigate the entire *chaîne opératoire*, it emphasizes paste preparation. We use these data to compare the steps of ceramic craft production between sites and aim to define local and regional potting traditions. Our results suggest that production steps were often consistent between sites, but recipes varied both over the centuries of the Mississippian time period and across the Middle Cumberland River drainage in Tennessee.

**Sosa Aguilar, Danny (California State University, San Bernardino)**

[132]

Chair

**Sosa Aguilar, Danny (California State University, San Bernardino) and Felicia De Peña**

[132]

*Practical Approaches to Indigenous Archaeology in Cultural Resource Management*

Practical approaches to Indigenous Archaeology in cultural resource management (CRM) can have real impacts on United States archaeology. This paper discusses the broader theoretical approaches and “high-level” changes that are being made (or could/should) be made in CRM. What types of changes can field techs/archaeologists make that work toward a more considerable change but are simple and easily applicable? What can be done by the “boots on the ground” people in the field that aids collaboration? We will discuss the current theory and uses of Indigenous Archaeology and acknowledge the changes in the State, Federal, and independent contractor levels. Furthermore, we will focus on the capacity for a potential community of practice around ethical and accountable preservation within CRM archaeology through a discussion of examples of collaboration at various stages of a project. Through the lens of communities of practice, we will approach monitoring and excavation, with a focus on preservation and an emphasis on indigenous perspectives. This allows for the exploration of shared repertoires, tasks, practices, shared meanings and language, and ultimately shared goals to promote ethical collaborative practices and transparency.

Sosa-Ruíz, Mónica [200] see Rodríguez-Rodríguez, Karla

Southon, John [179] see Chapman, Larkin

Speer, Charles [8] see Dudgeon, John

**Speller, Camilla (University of British Columbia), Eleni Petrou (US Geological Survey, Anchorage), Madonna Moss (University of Oregon), Dongya Yang (Simon Fraser University) and Lorenz Hauser (University of Washington)**

[218]

*The Archaeology of Herring: A 10-Year Effort to Overcome Technical Challenges, Part 2*

Pacific herring were an abundant and important component of the coastal ecosystems of western North America for millennia; today, many populations have been decimated as a result of commercial or reduction fisheries. Focusing on genomic data, our hypothesis was that population and phenological diversity was higher in ancient herring than today. Documenting the temporal and spatial populations structure of modern herring was essential for understanding the genetic diversity, population size, and spawning behavior of ancient herring. Through the genomic analysis of over 1,300 modern herring from 23 distinct spawning sites spanning 1,600 km of the Pacific northwest coast, 6,718 informative SNPs across the genome were identified, revealing population structure based on spawning time and geographic region. Seven SNPs associated with spawning time were targeted in archaeological bones to elucidate the use of herring from different spawning groups in Puget sound by Coast Salish people for over 900 years. Currently, we are applying hybridization capture and

whole genome sequencing to Puget sound and Alaskan sites to track changes in population size and genetic diversity over 2,500 years. Collaborations between modern fisheries scientists and archaeologists have been key for advancing research on this culturally and ecologically important forage fish.

Speller, Camilla [218] see Moss, Madonna

Speller, Camilla [76] see Oliver, Kristin

Speller, Camilla [208] see Paskulin, Lindsey

**Spenard, Jon (Cal State University, San Marcos)**

[115]

*Chair*

**Spenard, Jon (Cal State University, San Marcos), Michael Mirro (PaleoWest), Javier Mai (Rio Frio Regional Archaeological Project), Konane Martinez (Cal State University, San Marcos) and Franklin Quiros (Cal State University, San Marcos)**

[115]

*Extracting the Proverbial Bedrock of Society: A Report on Precolumbian Maya Granitic Rock Quarries in the Mountain Pine Ride, Belize*

Sourcing studies have consistently pointed to the plutons of the Mountain Pine Ridge (MPR), Belize, as the preferred source of granitic rock for making ground stone objects used by precolumbian Maya communities throughout the eastern lowlands. Nonetheless, questions about how the raw material was extracted remain unanswered. Were eroded nodules collected from the many stream beds flowing off the MPR, or was it quarried directly from outcrops? How was the work organized and who did it? In this paper, we report on precolumbian Maya granitic rock quarry sites in the MPR, the first ever recorded in the Maya area. Our studies reveal Maya people were quarrying raw material directly from outcrops and shaping preforms for a variety of objects in the immediate environs of the extraction sites. In this paper, we discuss the range of quarry types present so far recorded in the MPR, the tool assemblages used for extraction and preform creation at them, and we weigh our current evidence that local communities were working the sites.

**Spencer, Jessi, Kaleigh Best (Southern Illinois University, Carbondale) and Mark Wagner (Southern Illinois University, Carbondale)**

[82]

*Gone and All but Forgotten: An Overview of St Henry's Cemetery (11S1742), East St. Louis, IL, 1866–1908*

St. Henry's Catholic Cemetery (11S1742) in East St. Louis, IL, was interring largely German and Irish individuals from 1866 to 1908. As part of growing urbanization and societal sanitation concerns, the cemetery was closed and buried individuals were supposedly relocated by 1926. By 1951, the Illinois National Guard Armory was constructed on the site and is still in use today. Despite historical testimony otherwise, test excavations carried out in 2018 by Wagner et al. (2019), revealed that not only did burials remain, but they were in various states of exhumation. Utility line replacement involving Phase III excavation on the site began in November of 2021. By the end of January 2022, a total of 71 features were identified through mechanical stripping, with 47 features excavated and 32 analyzed in the lab. Of the 47 excavated features, 36 were found to have human remains present (77%), suggesting a great number of burials persists despite claims of relocation. This presentation highlights the 32 burials analyzed to provide information on the burial status, burial container, demographics (age, sex, trauma, pathology), incidental, mortuary, and cultural artifacts associated with each grave. This cemetery provides a glimpse into mortuary practices during Victorian times in St. Louis.

Spencer, Jessi [162] see Best, Kaleigh

**Spencer, Kaylee (University of Wisconsin, River Falls)****[133]***Classic Maya Cache Vessel Texts and the Stories They Tell*

Ancient Maya artists fashioned ceramic cache vessels that bear a rich array of painted imagery and iconography, making them popular subjects for scholarly investigation. Themes focusing on bloodletting and burning rites are emphasized in many of these discussions, and these themes form the foundations for interpreting the meanings and uses of this class of object. Despite the important insights these analyses have provided, few studies focus on the texts that frequently appear on Early Classic examples. This research provides an overview of this class of object and considers the frequently overlooked texts that appear on their surfaces. Drawing from a collection of cache vessels of a similar form and style, I seek to reframe and add nuance to interpretative models by analyzing the texts in relation to iconography, vessel design, and archaeological contexts.

Spencer-Smith, Jesse [95] see Morrow, Giles

**Spencer-Wood, Suzanne (Oakland University; Harvard University)****[138]***Chair***Spencer-Wood, Suzanne (Oakland University; Harvard University)****[138]***Empowering Social Justice by Developing a Black Feminist Intersectionality Theoretical Perspective to Increase the Inclusiveness of Historical Markers in Detroit and Wayne County*

A form of activist archaeology is undertaken by conducting research with a critical Black feminist intersectionality theoretical perspective to promote social justice in representations of America's heritage on historical markers in Detroit and surrounding Wayne County, Michigan, USA. Contrary to Kimberlé Crenshaw's Black feminist intersectionality theory that revealed the identity of Black women is invisible in the American legal system, this research finds that historical markers make intersectional minorities and women visible by labeling and marking them as deviant from apparently universal normative marker texts that are really about white Anglo-American men, whose dominance on markers is invisible because they are not labeled. The inclusion of more intersectional information about minorities and women is proposed for existing and new historical markers to educate the public about their important accomplishments that have been erased from history, to provide social justice for people who were marginalized in the past, re-enfranchise modern marginalized people of their powerful pasts, and inspire people working to decrease inequalities and oppressions today.

Spencer-Wood, Suzanne [138] see Cathcart, Danielle

Speraq, Frank [216] see Ford, Anabel

**Sperling, Stephanie (M-NCPPC, Dept. of Parks & Recreation)****[18]***Chair***Sperling, Stephanie (M-NCPPC, Dept. of Parks & Recreation)****[18]***Making Archaeology Relevant and Inclusive in a Local Park System*

Thousands of people are employed by Maryland-National Capital Park and Planning Commission (M-NCPPC), Department of Parks and Recreation, Prince George's County, but only two of them are full-time

archaeologists. These professionals are supported by a small part-time staff and are responsible for the stewardship of hundreds of sites, in addition to management of two archaeological parks, a paleontological park, a circa 1880 African American cemetery, and a collection of over one million artifacts and fossils recovered from park property. Despite this extensive portfolio, the team must perpetually develop creative tactics to promote the relevance of archaeological and paleontological resources. This paper will discuss these methods, including creating inclusive programming for residents in our majority-minority county and developing innovative partnerships with internal and external stakeholders, including descendant communities, natural resource managers, and marketing professionals.

**Sperry-Fromm, Elena**

[101]

*The Archaeology of Counterculture at the New Buffalo Commune*

[WITHDRAWN]

**Spinelli Sanchez, Océane (Archéosciences Bordeaux, Université Bordeaux Montaigne), Laurine Travers (Université de Montpellier), Alain Chauvet (Université de Montpellier), Michel Brenet (Université de Bordeaux) and Anne Delagnes (Université de Bordeaux)**

[21]

*Sampling Vein Quartz: An Adapted Fieldwork Protocol Combining Structural Geology and Archaeology*

Field sampling of lithic raw materials, whose protocol is already well developed for rocks such as obsidian and flint, is the basis for a wide range of studies. By contrast, quartz, frequently used for producing stone tools, still lacks a well-established sampling protocol that considers both geological and archaeological settings. However, the presence of several generations of quartz in the same geographical area can induce serious sampling biases. Highly different types of quartz, based on their age, mode of formation, deformation, fracturing, and consequently macroscopic features, can thus occur in the field and need to be distinguished using adapted criteria. Through the case study of the quartz of the Chassezac valley watershed in Ardèche (France), we argue that identification prior to sampling is pivotal for assessing the potential for procurement by prehistoric human groups. Furthermore, landscape anthropization due to quartz exploitation during historical times deeply modified quartz outcrops, which can induce sampling biases if not properly understood. Our study provides a new standardized protocol for building a reference collection of vein quartz, based on an approach combining structural geology and archaeology.

**Spivey-Faulkner, S. Margaret (University of Alberta)**

[51]

*Members of the Community: Animal Sculptures as Kin*

Archaeological evidence at the Fort Center archaeological site in south Florida indicates that rooftop statuary depicting animals were treated as members of the community. This evidence is found in the watery interment of these sculptures alongside human community members over time. This archaeological interpretation will be discussed through the lens of Muskogean philosopher Donald Fixico's framework of understanding community, relationality, and being.

**Splitstoser, Jeffrey (George Washington University) and Jon Clindaniel (University of Chicago)**

[246]

*Making Khipu Cords*

While Andean khipus—indigenous knot-and-cord recording devices—have been extensively studied over the past hundred years in their final, completed form, relatively little attention has been paid to the process by which they were made. As such, the level of agency that khipu makers, called khipukamayuqs, had in producing khipus is not fully understood. For instance, were khipu makers simply assembling preconstructed cords according to imperial edict? Were they granted the agency to produce their own cords and signs to

reflect the on-the-ground realities that they were meant to record? Or something in between? Answering these questions has the potential to better elucidate the labor involved in the production of khipus, as well as the relative expressiveness and capacity for on-the-ground creativity in the making of the khipu cord signs. In this presentation, we seek to fill this gap in the literature by investigating the process by which khipu cords were made in the Andes from Wari and Inka through post-Inka times. In order to do so, we draw on recent evidence from archaeological excavation, ethnographic sources, and detailed museum recording and analysis, as well as experimentation.

**Sponholtz, Julia****[140]***Eating Local: Plant Use and Identity in the Cinti Valley, Bolivia, in the Late Intermediate Period*

The Cinti Valley, Bolivia, has been occupied for at least 9,000 years, with an intensification in settlement in the Late Intermediate period. In 2004 Rivera Casanovas proposed that the sites in the Cinti Valley formed a three-tier site hierarchy, with a capital, local centers, and small villages. To study the impact of these settlement patterns on food and plant use in the valley, I sorted flotation samples collected from Palca Chica, a small village, and El Porvenir, a local center. I then compared the botanical assemblages of the two sites to study the differences between a small village and a local center, finding more local foods such as cactus, portulaca, and amaranth from El Porvenir, and more Andean staple foods like quinoa and corn from Palca Chica. Additionally, to understand how plant use in the Cinti Valley relates to the rest of the Andes, I compared my results to those of other Andean paleoethnobotanical studies from the Late Intermediate period. I found that the Cinti Valley sites had comparatively more local plant seeds and less traditional Andean staples compared to the other sites, suggesting that the residents of Palca Chica and El Porvenir developed their own local diets and identities.

Sponholtz, Julia [99] see Ranum, Caleb

Srinurak, Nattasit [109] see Moonkham, Piyawit

Sripathi, Lekha [166] see Brewer-Jensen, Ella

St. Claire, Denis [245] see Dierks, Katie

**Stackelbeck, Kary (University of Oklahoma) and Greg Maggard (Oklahoma Department of Transportation)****[19]***Dillehay's Legacy: Modeling Interdisciplinary and International Scholarship in Archaeology of the Americas*

With this paper, we reflect on Tom Dillehay's contribution to archaeology by highlighting several facets of his approach to interdisciplinary research and scholarship that have heavily influenced our own work and careers, and those of many others. We do so in part by exploring our collective hemispherical approaches to studying the peopling of the Americas and emerging complexity as expressed among populations in different regions of North and South America during the late Pleistocene through early Holocene. Specific focus is placed on Preceramic period archaeology in northern coastal Peru, as well as Paleoindian sites in parts of the Southeastern and Midwestern regions of the United States. We further present the ways in which lessons we learned under Tom's guidance continue to affect our careers today well beyond our respective initial research interests.

Stafford, Thomas [127] see Johnson, John

Stahlschmidt, Mareike [214] see Steele, Teresa

Standen, Vivien [102] see Arriaza, Bernardo

**Stanford, Grace and Briana Doering (University of Wyoming)**

[122]

*Mapping Thermal Features at Quartz Lake, Alaska*

Few archaeological sites from the late Holocene Dene/Athabaskan tradition have been extensively studied, leaving researchers with many questions about everyday practices. Specifically, the function and spatial distribution of thermal features has yet to be extensively evaluated. Despite the ubiquity of cooking in daily life and cooking features in the archaeological record of North America, many experts have identified a gap in archaeological research on cooking. Using the spatial distribution of fire-cracked rock (FCR) recovered from the Klein and Bachner Sites on the shore of Quartz Lake, Alaska and ethnographic/traditional knowledge from local descendant communities, we examine the positioning of thermal features within multicomponent sites and describe cultural uses of rock at these sites. Comparing traditional knowledge and archaeological data allows for a wholistic understanding of past use of thermally-altered rock and how these practices may connect with the late Holocene cultural transition in the region. This research can be compared to other sites in Central Alaska to add to what little is known about cooking practices and what life may have been like at Dene/Athabaskan tradition late Holocene occupations.

Stanford, Grace [130] see Doering, Briana

**Stanish, Charles (USF)**

[22]

*Discussant*

Stantis, Christina [245] see Lin, Audrey

**Stanton, Thadra**

[192]

*Archaeological National Historic Landmarks in the United States*

For over 60 years the US National Historic Landmarks (NHL) program has designated 2,600 sites across the country for their national significance. But the number of archaeological NHLs is much fewer than historic NHLs. This paper is an overview of the current archaeological NHLs and the diversity of sites represented. I will provide some insight on the challenges facing archaeological sites seeking NHL designation.

Stanton, Travis [100] see Clark, Jessica

Stark, Jonathan [30] see Brunette, Jeremy

**Stark, Richard, Alondra Flores (INAH) and Fernando Gonzalez (INAH)**

[239]

*Zapotitlan Earth Ovens and Their Middens: Ethnoarchaeology in Colima, Mexico*

Earth-oven processing of agave food and drink has a time depth in Colima, Mexico, of more than 7,000 years, providing a notable example of localized socioeconomic intensification processes throughout the Holocene.

The cultural setting for this research is observant of contemporary Agave Culture, a term used to describe people who utilize the plant for food, drink, fiber, fuel, shelter, and fencing. Ethnoarchaeological evidence is used in this report to compare agave processing with squash, corn, and meat earth-oven preparations within the Zapotitlan community. Agave, which appears both wild and cultivated in Zapotitlan, is planted to produce mescal and to create portions of garden fences, providing both protection and a perennial crop among gardens for annual multi-cropping of corn, beans, and squash. Zapotitlan garden complexes and their associated earth ovens and burned rock middens include unspoken gender rules and reiterated discard patterns. Descriptions of earth oven activity areas are complimented by a homogeneity/heterogeneity index for each midden. Artifact descriptions include earth-oven features, discarded basalt fire-cracked rock fragments forming middens, and specialized tool suites for processing agave, squash, and meat.

**Stark, Robert (Polish Centre of Mediterranean Archaeology, University of Warsaw [PCMA UW]) and Kendra Sirak (Harvard Medical School)**

[163]

*Monks and Makurians: Tracing Biology and Mobility at Medieval Ghazali (ca. 680 to 1275 CE)*

Located in the Wadi Abu Dom, approximately 15 km from the Nile in modern Sudan, the medieval Makurian site of Ghazali (ca. 680–1270 CE) was the location of a large monastic community with associated lay settlement nearby. As part of ongoing research at Ghazali, individuals from the four cemeteries identified at this site were sampled for  $^{87}\text{Sr}/^{86}\text{Sr}$  and ancient DNA for the combined purposes of investigating ancestry and engaging with questions of mobility and migration. The results of this study provide insights to the nature of mobility to the Ghazali area and the ancestral groups of inhabitants of this site, both monks and lay inhabitants. We present the results of this study, addressing and problematizing questions of mobility to the Ghazali area and the implications of biological background in the larger tapestry of ongoing paleogenomic research.

**Stark, Sören (Institute for the Study of the Ancient World, NYU)**

[141]

*Discussant*

Stark, Sören [134] see Monroe, Shannon

Starkovich, Britt [166] see Mentzer, Susan

**Stcherbinine, Sean**

[42]

*Overview of Excavations at Three Olcott Sites in Western Washington, USA*

Excavations at three precontact sites adjacent to the Elwha River in western Washington State, USA, recovered about 800 bone specimens and 40,000 chipped stone artifacts. The combined artifact assemblage is characteristic of Olcott-type sites in western Washington, most notably the presence of lanceolate projectile points manufactured from fine-grained and locally available volcanic raw materials.

The assemblage is dominated by debitage (95%), but also includes projectile points, bifaces, modified flakes, cores, and scrapers made from andesitic and dacitic raw material. The vast majority of bone specimens are calcined and unidentifiable to species. However, several bones were identified as deer remains. Preliminary results suggest a middle to early Holocene occupation of Pleistocene river terraces used to acquire nearby raw material in order to manufacture tools for hunting and processing deer and deer-sized mammals. As one of the largest Olcott assemblages, this is an important dataset for discussing early to middle Holocene land use on the Olympic Peninsula and western Washington.

Steber, Matthew [201] see Forest, Marion

**Steele, Teresa (UC Davis), Mareike Stahlschmidt (University of Vienna) and Susan Mentzer (Senckenberg, University of Tübingen)****[214]***Investigating the Impact of a Recent Wildfire on Tortoises at Cape Point, South Africa: Implications for Our Understanding of Ancient Pyrotechnology and Its Uses*

Archaeologists commonly interpret burnt materials at archaeological sites as relicts of human fire use activities, but processes other than human fire use may create burnt materials. Here, we examine if wildfires would leave specific heating signatures regarding the temperature or heating pattern on the skeleton that would be different from those produced in a campfire by investigating the skeletal remains of 50 tortoises that perished in a 2015 grass-shrub brushfire at Cape Point, South Africa. We recorded element preservation and visually assessed burning based on bone discoloration; we used a multilevel statistical model to test predictions about burning location relative to tortoise position in this natural experiment, while considering the skeletal elements that were missing; and we conducted infrared (IR) analyses on the tortoise remains as well as reference bones subjected to an incremental heating experiment to assess burning temperature. Our results suggest that temperature presents a low-confidence deciding factor between wildfires and campfires while skeletal burning pattern may be able to facilitate this distinction, because wildfires tend to result in random and complete burning patterns on tortoises while campfires may produce more localized burning signatures. We propose further research that could help facilitate these distinctions.

Steele, Teresa [214] see McNeill, Patricia

Steenken, Michael [148] see Bonzani, Renee

**Steere, Benjamin (Western Carolina University), Jennifer Birch (University of Georgia), Claire Auerbach (University of Georgia), Marcela Demyan (University of Georgia) and Alina Karapandzich (University of Georgia)****[142]***GINI and the Indigenous Critique: Dynamics of Equality and Inequality in Eastern North America*

In this paper we utilize the systemic, empirically driven methodology developed by the Global Dynamics of Wealth Inequality (GINI) project in order to evaluate and compare differences in wealth accumulation for Indigenous eastern North American societies. These societies were predominantly organized around multiple, overlapping, and intersecting institutions. Arguably, the most important of these were the clans and councils that served to distribute power and authority among multiple segments of society. The central tendencies of these diffuse institutional arrangements were to tamp down inequality. We hypothesize (a) that variability in GINI coefficients will be less pronounced in eastern North America than most other world regions and (b) that increases in GINI coefficients will occur in times and places where external or internal factors or events led to shifts in power, increases in violence, and other factors that disrupted the collectively oriented institutional basis of governance and equality in eastern North American societies. Drawing from Indigenous eastern North American philosophies, we suggest that comparing house size in communities may miss elements of social differentiation that are more obvious in other societies and may not always be visible through settler-colonial frameworks. Additional co-authors include Sarah Love, Tillman Norsworthy, Victoria Nuccio, and McKenna Waite.

Stefanski, Damian [152] see Picin, Andrea

**Steffen, Anastasia (Valles Caldera National Preserve; University of New Mexico)****[239]***Obsidian Fracture Resulting from Forest Fire Exposure*

Fire fractures in obsidian nodules and artifacts have been observed following several large forest fires at

quarries, other archaeological sites, and geological deposits in the Jemez Mountains of north-central New Mexico. This presentation describes the characteristics of thermal fractures observed in this brittle material and discusses the heating contexts in which this fire effect occurs, including consideration of heating experiments conducted as part of the ArcBurn project.

Stegemann, Julia [17] see Graham, Elizabeth

Steinke, Katharine [134] see Hamilton, Derek

**Stemp, W. James (Keene State College), Danielle Macdonald (University of Tulsa), Naomi Martisius (University of Tulsa) and Christopher Brown (Worcester Polytechnic Institute)**  
**[214]**

*Quantification of Use-Wear on Experimental Shell Tools: First Results Using Focus Variation Microscopy and Surface Roughness Analysis*

Increasingly, archaeologists have adopted various approaches from engineering and materials sciences to quantify the surfaces of artifacts and ecofacts. Different microscope systems and surface texture/roughness parameters have been employed with various degrees of success. Although most studies have focused on chipped stone tools and animal bones, to date there has been no attempt to quantify use-wear on shell tools. In this study, a Sensofar S neox microscope was used to mathematically document the surfaces on the edges of shell tools both before and after use. The shells were used to scrape a variety of materials, including wood, hide, and bone. Texture/roughness was calculated from the surface measurements taken on the used and unused shell edges using multiple ISO parameters, including multiscale analysis (relative area; area-scale fractal complexity). The results of this experiment indicate that the quantification of use-wear on shell tools is possible and that shell, as a raw material, may present challenges with regard to surface texture/roughness documentation. Discussion of the results includes an assessment of which parameters may be best for distinguishing used from unused shell tool surfaces and the surfaces of shell tools used on different contact materials, and possible problems resulting from postdeposition.

**Stephens, Jay (University of Arizona), Wayne Powell (Brooklyn College, CUNY), Ryan Mathur (Juniata College) and David Killick (University of Arizona)**  
**[166]**

*The “Bronze Age” of Southern Africa: Insights from Isotopes and Trace Elements*

The Southern Africa project (2015–present) uses lead and tin isotopes plus trace element concentrations to infer the geological provenance of copper and tin in Iron Age copper alloys, and to investigate the behaviors responsible for moving these objects from their geological source to the eventual site of deposition. During this research project, we discovered that the production and consumption of the alloy bronze were much more widespread than previously thought. Earlier archaeometallurgical work established the presence of bronze at large sites in southern Africa, but a recent project hinted at its presence at non-elite sites as well. Our project has built on these foundational studies and documented 34 sites, all dating after ca. 1200 cal CE, where bronze metal was recovered. These sites are distributed from northern South Africa to southern Zambia, and the tin content in these samples ranges between 1.1% and 15.5%. This presentation will summarize isotopic and chemical data from bronze samples and assess temporal and spatial patterns in alloying practice and tin source for a material that we now know was much more widely produced than previously realized.

Stephens, Jay [118] see Motta, Laura

Steponaitis, Vincas [95] see Kassabaum, Megan

**Sterling, Kathleen (Binghamton University)****[138]***The History and Practice of European Prehistory through a Black Feminist Lens*

Classics is undergoing a very public and painful reckoning with its use by white nationalists. Prehistoric archaeologists working in Europe have largely stayed out of the fray, perhaps due to many practitioners seeing our research subjects as “pre-racial” or our work as otherwise unrelated to these discussions. However, if we look at the intellectual history of European prehistory, there is a long thread of anti-Black sentiment that has had a profound impact on how the deep past is studied and presented. Indeed, intersectional anti-Blackness has actively hampered knowledge production, and will continue to do so without serious self-reflection about notions of “the primitive” and progress, and how these concepts have been developed. Models of cultural evolution that inevitably result in modern Western patriarchy are not neutral representations of observed data; rather, they are the result of and justification for colonialism that occasionally finds its way into white nationalist discourse. Beyond providing productive critique, a Black feminist perspective on the history and present practices of prehistory in Europe can also help us better understand the archaeological past and build a sustainable future for the discipline.

**Sterner, Katherine (Towson University) and Robert Ahlrichs (Commonwealth Heritage Group)****[232]***Production, Use, and Microwear Analysis of Experimental Quartz Tools*

In the Eastern United States, the most common material stone tools are made from quartz (Lewis 2021). However, there have been only a few microwear studies published on quartz in the Americas. Sussman (1985, 1988) used a combination of incident light microscopy and SEM, but she relied on bright field illumination instead of the now more commonly used Differential Interference Contrast (DIC) prism. In the Midwest and Plains, where chert and flint are the most commonly used raw materials, microwear analysis is regularly used to better understand site function. However, on the East Coast, these studies are much rarer because a robust set of procedures for conducting microwear analysis on quartz does not yet exist. In the summer of 2022, we collected large quartz samples from an outcrop in northern Virginia. We produced 30 quartz flakes that were then used in various tasks for different amounts of time. Consideration of the knapping process, as well as microscopic examination of the flakes before and after use provides us with a base upon which to build future quartz studies.

**Stevens, Nathan (CSU, Sacramento)****[88]***Investigating the Spread of the Bow and Arrow in California Using Large Datasets*

Archaeologists in North America often think of the bow and arrow as appearing more or less instantaneously, a conception baked into many culture historical schemes. However, this specialized technology likely has a more complex history. From a single Old World origin, it is thought to have spread to North America via the Arctic after about 5000 cal BP. From there, it seems to have moved from north to south and the from the interior to the coast in California, arriving on the Columbia Plateau by 2300 cal BP, in northeastern California by 1800 cal BP, and likely later in the Sierra Nevada and California coast. Rather than using typological or culture-historical categories to discern this technological replacement, this study plots salient artifact attributes from a large sample of projectile points from central and northern California through continuous time to provide more detail on the timing of the spread of this important prehistoric technology.

Stevenson, Sophia [29] see Nino, Sabrina

**Stewart, Ashley (Tennessee Valley Archaeological Research)****[120]***Discussant*

Stewart, Caitlin [45] see Jonsson, Emily

Stilborg, Ole [216] see Womack, Andrew

**Stokes, Robert (EMNRD-New Mexico State Parks Division), Cash Ficke (Eastern New Mexico University) and JoAnna Schultz (Eastern New Mexico University)**

[95]

*The Black Mountain Phase in the Southern Mimbres Valley: Addressing the Last “Fuzzy” Phase in the Mimbres Area Cultural Sequence*

The Black Mountain phase (AD 1180–1300) in the Mimbres Mogollon area is an important transition between the cessation of Classic Mimbres pottery production and masonry pueblos to a new suite of pottery types and poured adobe wall pueblos. Debate among Mimbres archaeologists primarily focuses on whether the occupants of Black Mountain phase sites were the same as the preceding Classic period or represent an influx of new people into the southern valley. The Mimbres Foundation excavated a few rooms at two sites in the 1970s, followed recently with two dissertations from limited excavation work at the Old Town and Black Mountain sites on the Deming Plain. However, because of overall limited work, this phase remains the least understood segment of the Mimbres Area cultural sequence. A new multiyear research project aimed specifically at addressing this issue was initiated by ENMU in July 2022 at the Agape Acres site on the NAN Ranch property. Here, we present current issues associated with understanding this important phase and present new data from our July fieldwork, including a radiocarbon date from a house floor and the results of our ground penetrating radar work.

**Stoll, Marijke (Indiana University)**

[40]

*Discussant*

[91]

*Chair*

**Stoll, Marijke (Indiana University)**

[146]

*Los Antepasados Eran Más Valientes: Ancient and Modern Movement in the Sierra Sur Mountains*

People living in the Sierra Madre del Sur mountains still travel largely on foot, especially where cars are impossible or when they are moving their livestock from one place to another. Prior to the widespread ownership of cars today, travel by foot was even more common and was the only mode of transportation in the prehispanic era. However, the Least Cost Path (LCP) analyses we use to model travel both in the present and the past fail to capture how people move through mountain landscapes because of built-in biases against high elevations. In this paper, I discuss the preliminary results of a recent ethnographic study in which participants from three local Sierra Sur communities guided me on trips to different locations on the landscape. During these trips, I interviewed each participant about their experiences living in and moving through mountain landscapes while also recording spatial data about these journeys with a GPS unit. Together, the qualitative and quantitative data provide a more holistic picture of movement in mountain landscapes. Aside from documenting rural people's experiences of mountains, these results will be used to generate improved LCP analyses for modeling travel in mountains that then can be used by archaeologists globally.

Stoll, Marijke [242] see King, Stacie

Stoll, Marijke [242] see Konwest, Elizabeth

Stone, Abi [212] see Leader, George

Stone, Abi [114] see Marks, Theodore

**Stone, Samantha (Oregon State University) and Loren Davis (Oregon State University)**  
**[145]**

*Measuring Past Networks of Cultural Transmission: The Haskett Projectile Point*

Advances in technology such as 3D digital scanning and spatial analysis software have provided archaeologists with novel data. Specifically, these methods increase the researcher's ability to measure artifact morphology and past networks of cultural transmission, to potentially track the movement of past peoples and ideas through space and time. This report utilizes spatial analysis software to measure the 3D morphometric variability between two samples of Haskett projectile points, one from the Haskett Locality in Idaho and one from the Great Salt Lake Desert in Utah, in order to establish a range of 3D geometric morphometric (GM) variation, and deduce whether or not Far Western precontact peoples during the Pleistocene–Holocene transition shared a network of cultural transmission. Although this analysis found differences in blade curvature and bounding box measurements, a Procrustes analysis revealed significant internal 3D morphology. This similarity in 3D GM, along with evidence of obsidian sourcing from American Falls, Idaho, in the Old River Bed Delta in Utah, supports the interpretation that precontact peoples in these areas shared a network of cultural transmission.

**Stoner, Edward, Thomas Lennon (WCRM Inc. [retired]), Thomas Bullard (Desert Research Institute, Reno, NV), Geoffrey Cunnar (New Mexico State Historic Preservation Office) and Charles Wheeler (WCRM Inc. [retired])**  
**[94]**

*A Tale of Two Projects: Geoarchaeological Investigations along the Shores of Pleistocene Lake Waring in Elko County, Nevada, and the Importance of Early Planning and Collaboration between Public Land Managers, Project Proponents, and Stakeholders*

Archaeological investigations conducted between 2015 and 2021 along the margins of a Great Basin pluvial lake applied multidisciplinary methods that resulted in the identification of significant deeply stratified sites. A geoarchaeological approach that entailed detailed mapping and modeling of the geomorphic settings for hundreds of cultural resource sites was employed to address questions regarding site location patterns, archaeological sensitivities, and human use of a changing landscape. This approach led to a critical examination of previous lake history models, and a reevaluation of the National Register eligibility of previously recorded resources. It engendered revised significance determinations for sites in geomorphic settings not conducive to the preservation of important archaeological data. It provides a framework for future collaboration between federal agencies and proponents during project development that can lead to more effective baseline studies, permit planning, mitigation measures, and stakeholder input. To realize such collaborative efforts, a geoarchaeological baseline must be initiated before cultural resource inventories are conducted and before National Register assessment. By establishing such baselines for undertakings in other pluvial lake basins under relevant historical contexts, real research questions can be posed and answered, less money will be spent, and Public Land Managers will achieve better heritage resource outcomes.

Stoner, Wesley [247] see Marino, Marc

**Storey, Glenn (University of Iowa)**  
**[125]**

*Comparing the Megalopolises of New and Old Worlds: Examining the Urban Infrastructure of Teotihuacan and Imperial Rome*

Two of the ancient world's largest cities were Teotihuacan in Mexico and Rome in Italy. Although their estimated population sizes are wildly divergent—the first of many features to be examined—the actual infrastructure, and thus the possibilities for the enhancement of social interaction, for both ancient sites show significant similarities. This poster will present analysis of comparative population dynamics, street layout, open spaces, public architectural facilities, sanitation, varieties of housing, and indicators of economic inequality. The integrating concept on display will be, following the suggestion of George Cowgill, the

character of the “lived experience” of the inhabitants, as reconstructed from the archaeological data for both sites and the documentation available for ancient Rome. Critical elements determinative of urban-rural relationships will also be featured, including the character of suburbs, and whether the giant cities, combined with larger nearby communities, could approach the threshold of being considered a kind of “ancient megalopolis.”

Stout, Dietrich [232] see Liu, Cheng

Stratford, Dominic [212] see Leader, George  
Stratford, Dominic [114] see Marks, Theodore

Stratton Garvin, Laurel [62] see Keith, Mackenzie

Straus, Kirsten [98] see Fitzgerald, Kimberli

Strauss, Andre [3] see Cardoso, Jessica

Strawn, James [89] see Miller, D. Shane

**Stroth, Luke (University of California, San Diego)**

**[55]**

*Chair*

**Stroth, Luke (University of California, San Diego)**

**[55]**

*3D Models of Small Artifacts: A Visual Workflow of the Structure-from-Motion Photography of Pottery Sherds and Vessels*

This presentation consists of video demonstrations with live commentary in which the author describes how to create 3D models of small ceramic artifacts using structure-from-motion photography (photogrammetry). In particular, the focus will be on troubleshooting common issues that arise during model generation of sherds and fragmentary and complete vessels. This workflow includes taking digital photographs in the laboratory, post-processing of photographs in the field or remotely, generating models, and long-term data curation. The workflow further emphasizes the importance of recording metadata and decision-making during the course of processing to ensure that models are as accurate as possible and can be recreated from the original photographs. The presentation will provide a discussion of the advantages of 3D models for comparing ceramic collections from different sites and give a preview of a growing digital reference collection of the pottery from southern Belize.

**Stuart, David (University of Texas, Austin)**

**[186]**

*Moderator*

**[238]**

*Discussant*

Stubing, Michael [99] see Chenault, Mark

Stueber, Daniel [89] see Duke, Daron

Stueve, Megan [28] see Haynes, Gregory

**Stumpf, Mara (University of North Carolina, Charlotte), Sara Juengst (University of North Carolina, Charlotte), Mozelle Bowers (University of North Carolina, Charlotte) and Zindy Cruz (University of North Carolina, Charlotte)**

[237]

*Remembering Valdivia through a Unique Manteño Burial at Buen Suceso*

Burials have long been considered primary sources of information regarding social ranking and inequality, social understandings of ancestors, conceptions of death, diverse representations of identity and agency, and emotional expressions of mourning and loss (see Baitzel 2018; Buikstra and Nystrom 2015; Parker Pearson 1999). Thus, burials that stand out as different from the norm are often given special attention in the present as they were in the past. This paper presents an intriguing Manteño burial from Buen Suceso, Burial 10, which included the remains of a female young adult. Likely pregnant at the time of death, this individual was buried with a series of spondylus ornaments, green stones, and shell eye coverings, all materials evocative of watery environments. Radiocarbon dates between AD 771 and 953 associate this individual with Manteño and the artifacts buried with them were made only by Valdivia peoples. The elements of this burial including the special origins of the spondylus, artifacts associated with water, and the individual's demographics indicate that this may have been a sacrifice focused on fertility potentially during a time of drought.

Stumpf, Mara [237] see Cruz, Zindy

**Sturm, Camilla (Barnard College), Liam Hayes (Columbia University) and Anna Campbell (Cornerstone Pottery Studio)**

[216]

*Ceramic Technology beyond the Rim: Reconstructing (and Firing) a Late Neolithic Chinese Kiln*

The past several decades have seen a shift in the focus of ceramic studies in Neolithic China from ceramic products toward ceramic production, as scholars have pushed beyond typological analyses to investigate the people who made, handled, and used these wares. Despite this turn toward process, comparatively little attention is given to the many technologies that make the production of pottery possible: the paddles and anvils, tournettes or kick-wheels, decorative tools like rope and stamps, and kilns that Neolithic potters relied on for their craft. In this presentation, we explore the labor and logic of one such “supporting” technology through experimental archaeology. Using excavation reports as a guide, our multidisciplinary team of archaeologists, professional potters, and kiln builders attempted to reconstruct and fire a Neolithic kiln. Our results—both successes and failures—provide a deeper understanding of the complex material technology of these kilns, and offer new insights to the social, environmental, and economic entanglements of Neolithic ceramic production.

Styring, Amy [53] see Hyland, Corrie

Styring, Amy [29] see Scott, Michael

**Su, Kai (Washington University, St. Louis) and Tristram Kidder (Washington University, St. Louis)**

[121]

*The Local Environmental Context for Settlement and Abandonment of the Wetland Site Haimenkou, Yunnan, China*

Haimenkou is a wetland site with exceptional preservation and represents one of the earliest Neolithic occupations in Southwest China at ca. 3600 cal BP. The site is located on the margin of the alpine Jianhu Lake

(ca. 2,200 m asl). A coring survey along the lakeshore reveals nearly 10 m fluctuation of the water level and complex intercalations of occupational layers, lacustrine deposits, and alluvial fans developed from the surrounding mountains. During the prolonged settlement (over 1,000 years) at Haimenkou, people changed the land- and waterscape significantly through deforestation and cultivation. Using the sediments and buried soils around the site, we reconstruct the environmental context and diachronic changes during the occupational period (ca. 3600–2300 cal BP) at Haimenkou. Field survey has identified exposed profiles that preserve evidence of lake level changes, drainage shifts, and alluvial fan developments. Multiproxy methods allow us to detect the major environmental changes during the flourish of the settlement and to explore the reason behind site abandonment, and to investigate the complex relationships between climate-driven and anthropogenic changes in this fragile environment.

Su, Yuyin [166] see Chiu, Scarlett

**Suárez Calderón, Amanda (University of Pittsburgh), Yahaira Núñez-Cortés (Universidad Nacional Autónoma de México) and Francisco Corrales-Ulloa (Museo Nacional de Costa Rica) [213]**

*Warfare and the Origins of Social Complexity in Southern Central America*

Southern Central America is rich in examples of early complex societies, and yet, the timing and mechanism for the emergence of social complexity and differentiation are still not well understood. Recent works are moving archaeologists in the region to question, on the one hand, the definition of social complexity itself, and on the other hand, the role of activities such as exchange of elite goods, agricultural and craft surplus production, religious ideology, and warfare in this process. The role of conflict and war has been sporadically mentioned and even less systematically analyzed. What is certain is that after 300 CE there is a rich and varied imagery related to either physical or symbolic violence. Sites with monumental architecture appear after 400 CE in strategic locations. Architectural features that could have served defensive purposes suggest an increase in competition and possibly conflict. Sixteenth-century chronicles indicate an acute intergroup conflict that may have had deeper roots in competitive complex societies. We will discuss briefly how our concept of social complexity is changing, and then examine some examples of sites that are shedding light on the role of warfare. Finally, we will propose some ways to move forward with the topic.

**Suarez Gonzalez, Nathalie (Université Libre de Bruxelles), Gontran Sonet (Institut Royal des Sciences Naturelles de Belgique) and Peter Eeckhout (Université Libre de Bruxelles) [163]**

*Paleogenetic and Paleopathological Studies at Pachacamac: Methodological Issues and Preliminary Results*

Ancient DNA (aDNA) analysis can be a useful tool for sex determination, general mitochondrial lineage (haplogroup), and disease diagnosis in human remains. However, non-endogenous DNA contamination of archaeological material is a recurrent problematic, since excavation, handling, and storage usually don't fit with the precautions recommended for aDNA analysis. Here, we present preliminary aDNA results from several human individuals recovered by the Ychsma Project (ULB) from the monumental archaeological site of Pachacamac, Peru, a corpus dating from AD 500 to 1400 where a high proportion of diseases is suspected. Our objectives are to complete the demographic information and to characterize the health status of the population buried in this pilgrimage site dedicated to the eponymous healing god. Our preliminary results show that, despite an important human DNA contamination, a strict selection of DNA reads with short sizes and damage patterns that are typical for ancient DNA was useful to determine the sex of most individuals, and mitochondrial haplogroup of some. The data were also used to estimate the presence of several pathogens including *Mycobacterium tuberculosis*, *Treponema pallidum*, and *Leishmania*. Our preliminary results suggest that our approach is appropriate for the detection of paleopathological conditions in this major archaeological corpus.

Subramaniam, Nandini [102] see Symmonds, Molly

**Sugiyama, Nawa (University of California, Riverside)**  
**[186]**

*Discussant*

**Sugiyama, Nawa (University of California, Riverside)**  
**[51]**

*Corporal Animal Forms as Ritualized Bodies in Burial 5, Moon Pyramid, Teotihuacan*

Applying a relational ontological approach to faunal bones I identify animals, secondary animal by-products, and faunal artifacts as persons—in the corporal animal forms of puma, eagle, wolf, and rattlesnake—whom actively engaged with entangled sociopolitical communities of humans. I present a case study of corporal animal forms participating as ritualized bodies in state dedicatory acts at the Moon Pyramid in Teotihuacan, Mexico (CE 1–550). It is in this enigmatic city, where the structure of governance remains highly debated, that I introduce corporal animal forms and other nonhuman persons as agents in the active negotiation of state power. Emphasizing the layered congruities relating each corporal animal form to human and other-than-human persons found in the dedicatory cache, I interpret how the participation of these apex predators in state ritualized performances materialized its sovereignty and sanctioned the authority of its centralized elite.

**Suina, Joseph (Pueblo de Cochiti)**  
**[90]**

*The Knowledge Keepers: Protecting Pueblo Culture from the Western World*

The clash that occurs when certain Pueblo information falls into the hands of outsiders is partly due to differing conceptualizations of knowledge between the Pueblos and the Western world. Except for highly classified government and personal information protected by law, just about anything is available to know and share in the dominant world. One only needs time, money, and the desire to acquire it, and it takes less than a minute to Google today's high-speed, fingertip-accessed information. Western knowledge is highly valued and the monetary rewards and status it brings to academics is substantial. Every field of study has a research component where the discovery of new information is expected to extend the knowledge base and the careers of those working within it. To deny information is to deny this opportunity, which goes against Western notions of success. Denying information creates suspicion of what people might be hiding or whether this behavior is even lawful and discriminatory toward non-Native inquirers. Herein lies the conflict over information sharing between Pueblos and the Western world. This presentation examines how traditional Pueblo culture can be protected and preserved.

**Sullivan, Kelsey (University of California, Riverside) and Kenichiro Tsukamoto (University of California, Riverside)**  
**[147]**

*Preliminary Results of Household Excavations at the Lithic Production Community of Took' Witz at El Palmar, Mexico*

In this paper, we present new research on the lithic production community of Took' Witz, a hinterland group near the ancient Maya polity of El Palmar in Campeche, Mexico. While previous research at Took' Witz focused on large-scale utilitarian lithic production, recent investigations provide insight into people's daily lives. Through excavations at three plazuelas—the West, East, and South Plazuelas—this project examines the impact that lithic production activities had on households at Took' Witz. These plazuelas are similar in size and configuration but have differences in proximity to the site's large lithic debitage deposits, as well as differences in topographic location. We sought to investigate how these spatial differences and the community's economic activities contributed to the material cultures and socioeconomic statuses of each plazuela. This paper provides the preliminary results of the 2022 field season at Took' Witz, the first season of a multiyear project. Specifically, we discuss the results of shovel testing throughout plazuelas and test pit

excavations in each plazuela. The shovel tests and test pits yielded spatial and temporal distributions of artifacts and chemical residues that represent different activities as well as the socioeconomic status of community members who lived at each plazuela.

**Sullivan, Vanessa (Colbr Consulting Inc.) and Chelsea Colwell-Pasch (Colbr Consulting Inc.)**  
[178]

*Emergent Field Methodologies from New Brunswick: Madawaska Method for Shallow, Fast-Current River-Bottom Surveys*

[WITHDRAWN]

**Sumner, Raymond and J. Javi Vasquez (Center for Environmental Management of Military Lands)**

[209]

*Synchronizing Views: The Development of the Sentinel Cultural Resource–Common Operational Picture (CR-COP) Tool as a Solution for Large-Scale NHPA Compliance and Consultation Challenges*

Over the next 20 years, the United States Air Force (USAF) will decommission the Minuteman III ICBM and replace it with the Sentinel ICBM. This project includes the replacement of 450 missile launch facilities and 45 missile alert facilities, the installation of 8,000 miles of utility lines and 62 communications towers, and the construction of over 50 new facilities on five USAF installations across six states. To complete the project and comply with the National Historic Preservation Act, the USAF consulted with 7 SHPOs, 63 tribal governments, the ACHP, and over 20 state and federal agencies to develop a programmatic agreement that covers the 20-year lifespan of the project. As the project is a schedule-driven national security project, many of the normal Section 106 timelines had to be compressed. To facilitate and expedite future consultations over dozens of reports annually, the USAF developed the Cultural Resources–Common Operational Picture (CR-COP) to as a collaborative tool. The CR-COP standardizes reporting, serves as a data repository, provides real-time tracking of field crews, and provides a workflow tracking system. This presentation provides an overview of the CR-COP and its development and explores how a similar model may be utilized in future projects.

**Sun, Xiaofan (Jilin University), Sen You (Jilin University), Jinping Wang (Shanxi Provincial Institute of Archaeology), Quanchao Zhang (Jilin University) and Qian Wang (Texas A&M University)**

[102]

*A Bioarchaeological Study of a Trepanation Case with Special Reference to the Medical Care System during the Western Zhou Dynasty China (1045–771 BCE)*

Therapeutic craniotomy is a kind of artificial trepanation used for treating head injuries. In this study, a skull with signs of trauma and trepanation from a young adult female who lived 3,000 years ago was assessed in the context of medical care systems and a policy of benevolence during the time. A blunt force assault on the left temporal bone induced a depression fracture and possibly an intracranial hematoma. It is believed that an artificial craniotomy was applied as a post-trauma procedure to treat the head injury. The healing signs at both the fracture area and the trepanation suggest that the patient survived both assault and craniotomy for a period. This successful case of advanced neurosurgery on a commoner during the Western Zhou Dynasty is revolutionary: it not only confirms the antiquity of artificial craniotomy as a therapeutic procedure for injuries but also provides bioarchaeological evidence of medical systems within ancient China. This case corroborates written records of institutional efforts to assign medical resources to care for commoners during the Zhou Dynasty.

Sun, Yonggang [25] see Sun, Yufeng

**Sun, Yufeng (Washington University, St. Louis), Yonggang Sun (Chifeng University), Petra Vaiglova (Griffith University) and Xinyi Liu (Washington University, St. Louis)**  
[25]

*Agricultural Labor Organizations and Management Strategies in the Prehistoric Erdaojingzi Site, Inner Mongolia, China*  
Food preparation is an arena for the understanding of social performances, and its scope is often indicative of the fabrications of social relations in historical contexts. This paper investigates daily food preparations in archaeological contexts and considers social bonds through the lens of mundane meals. By doing so, we aim to shift the focus from the ritualistic aspects of food to emphasize the role of the primary agent of agricultural production, ordinary farmers. The excavations and flotation work at the Bronze Age site Erdaojingzi (ca. 3500 cal yr BP) in southeast Inner Mongolia make it possible to investigate the labor organization of prehistoric farming societies in the region. Combining crop processing and plant stable isotope analyses, our preliminary results show grain processing activities were organized within each household as well as collectively involving the larger settlement community. In the field, millet cultivation was likely managed with members from multiple households. This research offers an opportunity to gain insights into the social bonds and labor organizations in the context of millet production, paving the way to understand the economic disparities of different subgroups in prehistoric societies.

**Sunell, Scott (MCB Camp Pendleton), Eleanor Fishburn (CSU, Channel Islands), Gina Mosqueda-Lucas (CSU, Los Angeles) and Brianna Rotella (Rincon Consultants Inc.)**  
[99]

*Front-Loading Backfilling: Site Stabilization of a Cliffside Shell Midden at l'akayamu*  
We present the design of a sampling project at one of the three archaeological sites composing the Late/Historic village of l'akayamu on limuw (Santa Cruz Island, California). We developed our methods with two goals: first, to support effective site stabilization post-excavation; second, to recover fragile artifacts eroding from a sea cliff while generating new data about the pattern of village occupation through time. We describe our design process for excavation and stabilization of a column sample in high-density shell-bearing midden. After excavation with brushes and trowels, we backfilled the column sample using a two-layer stabilization system. The first layer consists of a nonwoven geotextile placed tightly in contact with the unit walls, held in place by sterile boulder-and-sand backfill, which then doubles back to help retain the small particles in the fill material. The second layer is a galvanized chain-link fence secured at ground level above and below the unit that provides support for the nonwoven geotextile and backfill. We designed this system to permit normal percolation while preventing slumping, erosion, or collapse on the cliff-face. In sharing our work, we hope to highlight approaches to sampling that responsibly incorporate post-excavation stabilization efforts into the initial project design.

Sunell, Scott [181] see Holguin, Brian

Sunseri, Jun [152] see Byram, Scott

Surovell, Todd [118] see Litynski, McKenna

**Sutter, Richard (Purdue University—Fort Wayne) and Gabriel Prieto (University of Florida)**  
[227]

*Biodistance Comparisons for the Chimú-Era (AD 1000–1450) Child Sacrificial Remains from Pampa la Cruz, Huanchaco, North Coast of Peru: A Preliminary Report*  
Here we report dentally derived biodistance results for 120 Chimú-era (AD 1000–1450) children from three of six temporally discrete sacrificial events—specifically events 1, 4, and 5, at Pampa la Cruz (PLC), Huanchaco, Perú, which we compare with a late Chimú-Inka affiliated skeletal sample ( $n = 44$ ) from the nearby cemetery at Iglesia Colonial, Huanchaco, as well as nine additional previously reported skeletal

samples from the north coast of Peru. Our preliminary results suggest that the PLC sacrificed children from each of the events were not drawn from local Chimú people, but—instead—likely came from other coastal populations of Peru that were under control of the Chimú. Examination of FST derived estimates of sample variabilities suggest that the children from each episode were drawn from a variety of locations, likely from regions conquered during the Chimú Empire's expansion. These preliminary biodistance results lend support to interpretations based on clothing and grave offerings associated with the children sacrificed during each of the discrete events. We discuss the relevance of these results as they relate to the Chimú Empire's offeratory practices, political expansion, and population control policies.

Sutter, Richard [3] see Gagnon, Celeste

Swanson, Steve [206] see Arp, Ryan

**Swarts, Kelly (Gregor Mendel Institute)**

[20]

*Discussant*

[20]

*Chair*

**Swarts, Kelly (Gregor Mendel Institute), Miguel Vallebuena-Estrada (Gregor Mendel Institute), Lisa Huckell (University of New Mexico), Hernan Burbano (University College London) and Bruce Huckell (University of New Mexico)**

[20]

*Spread of Maize into Temperate North America*

Maize entered the southwestern United States nearly 2,000 years before maize agricultural practice is visible in the archaeological record on the Colorado Plateau. Previous work found that the early cultivated maize on the Plateau, 2,000-year-old samples from Turkey Pen Shelter, were already at least partially adapted, and ancestral to modern Puebloan maize (Swarts et al., *Science*, 2017). Here we present results from 4,000-year-old maize samples excavated from McEuen Cave, situated in the Sonoran Desert at the base of the Colorado Plateau.

Swarts, Kelly [20] see Vallebuena-Estrada, Miguel

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

[19]

*Andean Philosophies, Social Theory, and the Use of Analogies in the Interpretation of Andean Built Environments*

Dr. Tom Dillehay has significantly advanced Andean studies and archaeological theory and method, and a short presentation could never do justice to the extraordinary breadth of Tom's many contributions. In my paper, I focus on Tom's invaluable investigations of Andean ideologies of space and his pioneering use of ethnographic analogies to interpret the meaning and ontological status of built environments in ancient South America. I mobilize architectural data from the Jequetepeque Valley of northern Peru, where I have long conducted research and was first introduced to the region by Tom and his co-director Alan Kolata. I comparatively examine how ceremonial constructions in the Cañoncillo region in southern Jequetepeque encoded ideologies of social and cosmic dualism. I explore in turn how specific monuments were engaged as animate and powerful persons. However, my comparison demonstrates that Andean worldviews recorded ethnographically do not find direct equivalence in the material traces of our analysis. Instead, I make use of analogical reasoning to identify important historical differences through time, as my survey of the ceremonial centers of Jatanca, Huaca Colorada, and Tecapa intends to demonstrate. An interpretive framework inspired by Tom, our research strives to bring social theory into dialogue with Andean philosophies and cosmologies.

Swenson, Edward [208] see Paskulin, Lindsey

**Swett, Emily****[44]***Excavating the Archives: A Reanalysis of Artifacts Recovered from Catclaw Cave*

In 1949, a master's student at the University of Arizona, Barton Wright, undertook the first salvage excavation project at Catclaw Cave in anticipation of the construction of Davis Dam. The assemblage recovered by Wright and his team remains one of the best persevered dry shelter collections recovered from the region. This poster represents the results of the reanalysis of artifacts recovered from Catclaw Cave in order to better determine use and habitation of the Lower Colorado River Valley prior to contact with Europeans, utilizing museum-based archaeological approaches that promote collaboration between Indigenous and descendant communities, researchers, museums, and federal agencies.

Swift, Jaime [209] see Lowe, Kelsey

Swigart, Amber [105] see Kardulias, Drosos

**Swisher, Kimberly (University of Michigan)****[76]***Feasting and Social Integration: Connecting Faunal Use and Consumption from the Nuclear Core of a Mississippian Site (Singer-Moye 9SW2)*

Food is not only a means of nutrition and nourishment but also a way to bring people together, share experiences, and create memories. Some of the ways food is most noted is through special events or circumstances when large meals or atypical foods are used to bring groups of people together. Feasts, however, can serve many purposes. It is not just the food that is important but also everything that goes into the experience such as collection, preparation, serving, time of day, and time of year. Every step has implications tied into why and how the food is being consumed (or not consumed) and to what end. Feasting is one way to aggregate people and to build solidarity, as well as institute or reaffirm group practices, beliefs, and roles. Faunal data from 2013, 2016, and 2017 excavations by the University of Georgia's SMASH project at Singer-Moye (9SW2) provides a unique opportunity to better understand aggregation and community building at a large multi-mound Mississippian site via feasting. Faunal studies demonstrate an episodic, large-scale consumption event at the site core to aggregate people, create communal solidarity, and reform social structures during a time of population influx and continuation of monumental construction.

Swisher, Mark [179] see Mack, Joanne

**Symmonds, Molly (Hamilton College), Colin Quinn (Hamilton College), Lacey Carpenter (Hamilton College), Nandini Subramaniam and Horia Ciugudean (Muzeul National al Unirii)**  
**[102]***A Computational Approach to Bone Histology Analysis in Archaeology*

The Early Bronze Age in Transylvania exhibits two different mortuary traditions, one associated with the Yamnaya migration in the lowlands and the other associated with the local Transylvanian groups in the highlands. A key question for archaeologists has been how these traditions differ in respect to primary and secondary inhumation. The tempo of funerary rituals, including immediate internment or excarnation, reveals meaningful data about the social experience of individuals and communal ideas about living and dying. Microbial activity that helps with body decomposition often results in damage to bone histology. However, more rapid removal of flesh, such as through excarnation, can preserve bone histological structures. While microscopic analyses are becoming more common in bioarchaeology, existing methods are often qualitative assessments and do not quantify histological preservation. This poster presents the application of a new method to quantify bone degradation and automate the determination of fleshed or defleshed bone samples.

This new method is applied to samples from several Early Bronze Age cemeteries in Alba County, Romania. These results demonstrate the utility of formalizing these microscopic observations to yield insights into the performance of mortuary practices and cultural difference.

Szpak, Paul [29] see González Gómez de Agüero, Adrián  
Szpak, Paul [218] see Miszaniec, Jason

**Szremksi, Kasia (University of Illinois) and Carla Hernández Garavito (University of California, Santa Cruz)**

[19]

*Interactions, Geopolitical Mastery, and Empire: What Local-Level Political Machinations Tell Us about Imperial Strategy during the Late Prehispanic Period*

Tom Dillehay's early research in the Peruvian Chillón valley integrated archaeological and historical methods to demonstrate that Inka imperialism was not monolithic. Critically engaging with traditional models of verticality among Andean communities, his data-rich research demonstrated that the previous interactions of local communities, particularly patterns of resource-sharing, were key to Inka imperial geopolitical projects. In this presentation, we build on this approach and discuss the lasting influence of Tom Dillehay's research in Chillón through two different archaeological case studies: Huarochiri and the Chancay. In Huarochiri, historical sources help identify different communities' mobility, hierarchies, and specialization. With the Inka conquest, these communities gained access to new territories and a new standing among the regional polities. Archaeological excavation and material analysis show that Inka control relied heavily on existing regional dynamics and Huarochiri's position as a gateway between the central coast and the highland region. Likewise, archival data paired with new data from excavations in the Huanangue valley show how the Chancay leveraged their position as merchants and farmers to form strategic alliances with both the Chimú and the Inka, perhaps as part of a ploy to gain material advantages by playing both sides of the Chimú-Inka conflict.

**Szuter, Christine (Southwestern Foundation)**

[195]

*Discussant*

Taché, Karine [218] see Pothier-Bouchard, Geneviève

Tackney, Justin [88] see Potter, Bethany

Takase, Katsunori [163] see Shichiza, Yuka

**Takatsuchi, Ryohei (University of California, Riverside), Karina López Hernández (Proyecto Templo Mayor, INAH) and Víctor Cortés Meléndez (Proyecto Templo Mayor, INAH)**

[133]

*A Symbolic Consideration of Birds in Teotihuacan and Mexico-Tenochtitlan*

Pre-Columbian material and visual culture encapsulate ideologies and symbolism of the Mesoamerican past. Birds play important roles in Mesoamerican societies, both as daily sources of food and in symbolic and ideological contexts found in ceramic and sculptural iterations combined with archaeological and zooarchaeological contexts. This paper will examine the anthropomorphic and zoomorphic transliterations viewed through the art historical and archaeological records of the people of Teotihuacan (150/50 BCE–550 CE) and Mexico-Tenochtitlan (1325–1521 CE). Birds, in part and in whole, are part of the symbolic languages

of both cultures. Broadly speaking, birds are associated with a number of themes including war, sacrifice, death, water, fertility, and wealth. Birds are integrated into themes of Mesoamerican worldviews and rituals throughout contexts in Teotihuacan, Tenochtitlan, and in historical sources in sixteenth century in Mexico. The ritual and symbolic meaning behind the manipulation of birds in ceramics, imagery, and sculpture are an intersection of daily life and ritual activity of the ancient Mesoamerican past.

Take, Jelke [114] see Desjardins, Sean

Taladoire, Eric [172] see Ruiz, Judith

**Talamo, Sahra (Alma Mater Studiorum, Department of Chemistry G. Ciamician)**

**[206]**

*Chair*

**Talamo, Sahra (Alma Mater Studiorum–Università di Bologna), Wioletta Nowaczewska (University of Wrocław), Andrea Picin (Alma Mater Studiorum–Università di Bologna), Adam Nadachowski (Institute of Systematics and Evolution of Animals) and Jean-Jacques Hublin (Collège de France)**

**[206]**

*A 41,500-Year-Old Decorated Ivory Pendant from Stajnia Cave (Poland) Reveals the Earliest Punctate Ornament in Central Europe*

It may be a cliché to say that art is a form of symbolic behavior and modern cognition as old as humankind itself. In Europe, recurring evidence of body decoration and artistic expression is associated with the emergence of cultural innovations introduced by *Homo sapiens* in the Upper Paleolithic. Thus far, the earliest manipulation of animal teeth to be used as pendants was found in Bulgaria at ~46,000 BP. Successively, highly standardized manufacturing processes for producing ivory beads are documented in Aurignacian sites in the Swabian Jura and indirectly dated before 40,000 BP based on the chronostratigraphic succession. New cultural innovations emerged, such as making ivory figures and a novel type of punctate decoration used to transfer natural patterns into a new context. However, the timing of the beginning of this artistic explosion is still debated. Here we report the discovery and direct dating of a decorated ivory pendant from Stajnia Cave in Poland. It was created at 41,500 BP, making it the earliest punctate ornament found in Central Europe so far. This finding demonstrates the importance of directly dating an object of Paleolithic art to explain the origin of communication, celebration, and expression of *Homo sapiens* in Europe.

Talamo, Sahra [87] see Negrino, Fabio

Talamo, Sahra [152] see Picin, Andrea

**Talaverano Sanchez, Arlen (Universidad Nacional Mayor de San Marcos) and Daniela Raillard Arias (Northwestern University)**

**[36]**

*Landscapes and Ecologies of Chachapoya Ancestral Sites: Preliminary Results from the MAPA-SACHA Project*

In limestone cliffs and on lush slopes of northeastern Peru's montane cloud forest, Indigenous Andean communities known as the Chachapoya built mortuary architecture for their dead for centuries before Spanish colonization. For Indigenous Andeans, ancestors are powerful social agents that can intercede in the lives of descendant communities and the nonhuman environment. The MAPA-SACHA project (Medio Ambiente, Paisajes y Arquitectura de los Sitios Ancestrales Chachapoya) examines how these ancestral sites mediated the relationship between people and the environment across the central traditional Chachapoya territory, from approximately 800 to 1470 CE. In this talk, we present the preliminary results from fieldwork in which we collaborate with local guides to conduct aerial drone photography, participatory mapping,

architectural survey, and sampling of building materials. Local ecological and spatial knowledge combined with aerial photogrammetry documents relationships of visibility and proximity of ancestral sites with water bodies, groves, residences, and agricultural terraces across the landscape. Analysis of construction technologies and building materials, like clay mortar, plaster, and preserved wood beams provides a refined chronology for Chachapoya ancestral sites and insight into their socioecological significance. Finally, local forestry knowledge informs our application of dendro-climatology to reconstruct ancestor-environment relations through study of growth rings from archaeological wood.

Tandberg, Tom [6] see Pro, Sire

**Tang, Liya, Hui Zhou (Northwest University, Xi'an, China) and Zhiyou Wang (Shaanxi Academy of Archaeology, Xi'an, China)**

**[67]**

*Agricultural Practices of the Qin People from the Warring States Period to the Qin Dynasty: A Case from the Matengkong Site in Guanzhong Basin, China*

In archaeological studies, the Qin people have often been the subject of research. The areas of investigation about the Qin include their origin, structure of tombs, funeral rites and interment processes, and cities and settlements. Although there are some studies on the Qin people's diet through isotope analysis, the research on the agricultural system of the Qin people is still limited, especially during the period from the Qin people's settlement in the Guanzhong Basin to the First Emperor bringing the seven states under his domination. In the backdrop of the Warring States period, it is necessary to investigate what the Qin people's agricultural economy was and how it impacted their social progress. This study evaluates the Qin people's agricultural practice based on flotation results from the Matengkong site, located southeast of the Guanzhong Basin in Shaanxi province. The results showed that the inhabitants practiced multi-cropping, and the crop assemblage had five categories, including dominant foxtail millet (*Setaria italica*) and wheat (*Triticum aestivum*), important broomcorn millet (*Panicum miliaceum*), less important soybean (*Glycine max*) and adzuki bean (*Vigna angularis*), less utilized barley (*Hordeum vulgare*), and cannabis (*Cannabis sativa*) and rice (*Oryza sativa*) of the lowest utilization.

**Tang, Yiyi, John Marston (Boston University) and Xiangming Fang (Zhejiang Institute of Cultural Relics and Archaeology)**

**[68]**

*Early Millet Cultivation, Subsistence Diversity, and Wild Plant Use at Neolithic Anle, Lower Yangtze of China*

This study examines the macrobotanical assemblage of Anle, a middle Neolithic site in the Lower Yangtze region of China. The Lower Yangtze is thought to be the origin of domesticated rice and most studies of this region to date have focused on rice domestication and cultivation within its paleoenvironmental setting. In contrast, we highlight here diverse uses of non-rice plant resources. In addition to large quantities of rice remains (carbonized grains and spikelet bases), we identify both foxtail and broomcorn millet, both AMS radiocarbon dated earlier than 5750 cal BP, demonstrating the dispersal of millet cultivation to the Lower Yangtze in the middle Neolithic, earlier than previously documented. While most wild species identified in macrobotanical assemblages are traditionally categorized as weeds, many can be exploited for food and medicinal purposes. By analyzing the ecological and functional implications of identified plants, we infer ecological niches of cultivation, gathering, and possible propagation of wild plants as food and medicine. Analyses of diversity and seasonality of plant resources identified show that Anle residents created a complex seasonal sequence of temporally compatible crops, constructing niches for two crops (rice and millet) and actively structuring opportunities to exploit available wild plant resources in their immediate environment.

**Tantaleán, Henry (Universidad Nacional Mayor de San Marcos)****[22]***Science Never Stops! Una Década de Arqueología en Chíncha con Chip Stanish*

En esta ponencia se describen y se discuten los principales descubrimientos empíricos, metodológicos y teóricos realizados por Charles Stanish durante una década de investigaciones arqueológicas en el valle de Chíncha, Costa Sur del Perú.

Tarasov, Pavel [53] see Wang, Yucheng

**Tarrant, Damon (Simon Fraser University), Laura Yazedjian (British Columbia Coroners Service) and Michael Richards (Simon Fraser University)****[29]***Application of Dietary Isotopes to Estimate Temporal Context of Unidentified Remains in British Columbia Canada*

Isotopic analysis has been used in archaeological and forensic contexts to examine diet, migration, trace evidence, and the origin of individuals. This project examines whether individuals were of a forensic or archaeological context using  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ , and  $\delta^{34}\text{S}$  isotope values on behalf of the British Columbia Coroners Service. Carbon, nitrogen, and sulphur were analyzed as they are indicators of diet and thus could differentiate an archaeological or contemporary population. Collagen extraction followed the modified method (Brown et al. 1988). Isotope values were measured using a Thermo V Delta CF-IRMS. Historical populations in British Columbia typically maintained a marine diet resulting in a higher  $\delta^{15}\text{N}$  and  $\delta^{13}\text{C}$  isotopic values. Seven individuals had higher  $\delta^{15}\text{N}$ ,  $\delta^{13}\text{C}$ , and on average higher  $\delta^{34}\text{S}$  isotopic values. This supports a marine-based diet, and thus, suggests that these individuals are more likely of an archaeological context. Two individuals reflected a terrestrial diet with lower  $\delta^{15}\text{N}$ ,  $\delta^{13}\text{C}$ , and  $\delta^{34}\text{S}$  isotope values. Thus, these two individuals are more likely from a forensic context.

**Tashmanbetova, Zhuldyz, Paula Doumani Dupuy (Nazarbayev University) and Aidyn Zhuniskhanov (Nazarbayev University)****[141]***Development of Pastoralism in Prehistoric Central Asia: A Case Study at Koken, East Kazakhstan*

The tradition of practicing mobile pastoralism in Central Asia's steppe, forest-steppe, and foothill regions stretches back to at least the Bronze Age period (ca. 3500–800 BC). This preliminary study explores environmental biases and related human choices in livestock management during the period of early emergence and subsequent spread of pastoralist lifeways and practices in Central Asia. To understand patterns of animal exploitation and its relation to environmental variations, this paper presents the results of faunal analysis of a large zooarchaeological assemblage from the multi-period Bronze Age site of Koken and discusses this new data in relation to previously published zooarchaeological data from other Bronze Age settlements in Central Asia. This study contributes the first reconstructions of herd management and structure for East Kazakhstan and interrogates the notion that environment and microclimates correlate to herd composition and species selection in prehistoric Central Asia.

**Tate, Carolyn (Mesoamerican Art History, Texas Tech)****[52]***A Midwife's Memorial: La Venta "Tomb" C*

One of the most elaborate tomblike deposits at La Venta may commemorate a female ritualist, possibly a midwife. This paper explores the contents and surroundings of Tomb C and relates them to the widespread imagery of women and pre-birth humans at this Middle Formative ritual and pilgrimage site. It uses analogies with Mixe ritual as evidence for the purpose of the Tomb C offerings.

Tautunu, Ta'iao Matiu Matavai [207] see Cochrane, Ethan

**Taylor, Amanda (Willamette Cultural Resources Associates)**

[107]

*Moderator*

**Taylor, Amanda (Willamette Cultural Resources Associates), Steven Moses (Snoqualmie Indian Tribe), Robert Kopperl (Willamette Cultural Resources Associates) and Charlotte Beck (Hamilton College)**

[37]

*Beyond Paleoarchaic Lithic Procurement at the Bear Creek Site*

More than 3,600 chipped stone artifacts were recovered from the Bear Creek site in Redmond, Washington, primarily from a context dating to ca. 12,500–10,000 cal BP. Projectile point styles include unfluted lanceolate and Western Stemmed Tradition points. The site was excavated as part of a cultural resources management project in 2009 and 2013. In this paper, we address questions about toolstone and technology prioritized by the descendant communities of the people who created the site. We use reduction sequence analysis, central place foraging models, and other approaches to explore how people interacted with their lithic landscape. We also explore the gaps in a scientific perspective on ancient technology and directions for future research.

**Taylor, Bernie**

[206]

*Origins of Parietal Art: Evidence from the Archaeological Record*

The interpretation of drawings and engravings rely on our unique ability to internally process visual information and identify recognizable patterns. This same ability processes imaginary patterns, such as animals and faces of people in geological formations, clouds, and stars. The phenomenon of identifying imaginary patterns, referred to as “pareidolia,” is apparently innate to humans and logically should have preceded our earliest parietal art. In this study, Upper Paleolithic parietal images from caves on the Iberian Peninsula were examined for natural irregularities on the walls that may have been utilized in the construction of the depictions. These images were also compared with prominent geological formations observed outside of caves in the region. The findings demonstrate that Upper Paleolithic cave artists in northern Iberian Peninsula found pareidolia in geological formations inside and outside of caves and projected those visualizations as parietal art.

**Taylor, Ian**

[65]

*Victorian Values: North American Archaeology at the British Museum during the Nineteenth Century*

The founding collection of the British Museum, given by Hans Sloane in 1752, contained several Archaic and Late Prehistoric stone points from North America, some of the first examples from the continent to be included within early museum collections. Over the following 150 years the collection expanded rapidly fulfilling a need for contemporary, analogous material to inform theories replacing a Biblical explanation for human origins, with those emerging from the evidence exposed in the Somme Valley and Southern England. A large part of the collection serves this purpose in a largely visual fashion, being for the most part lithic artifacts with little detail regarding provenance and cultural background. Several collections, however, have good (for their time) contextual detail: objects and samples extracted from the Mississippi Valley by Squier and Davis and the Chumash objects acquired along the California coast by Freer and Summers. Though some scholarly attention has been paid to the material, by significant workers in their field, overall the collections still have much to offer. The collections will be given an overview, discussed historically and, from the vantage point of the present, discussed relative to the archaeological record as it exists today.

Taylor, Jan [224] see Knell, Edward

**Taylor, Samantha (New South Associates), Sarah Lowry (New South Associates) and Benjamin Porter (Swann Middle School)**

[149]

*The Partnership of Archaeology and Middle School Social Studies: The Creation of the Curriculum-Guided Cypress Street School Archaeology Project, Guilford County, North Carolina*

This paper will discuss the ongoing Cypress Street School Archaeology Project in Greensboro, North Carolina. The Cypress Street School Archaeology Project is a collaborative effort between New South Associates Inc. (NSA) and the Melvin C. Swann Jr. Middle School (Swann). In 2020, NSA partnered with the social studies faculty at Swann to provide students with experience researching and surveying the Cypress Street School (31GF601) as part of their social studies curriculum. The Cypress Street School is an early twentieth-century primary school whose buried material is located on Swann's campus. The work consisted of archival research, ground-penetrating radar (GPR) survey, and unit excavation. Students were involved in every step of the process, including examining historic maps, participating in the GPR survey, developing research questions, and determining excavation unit locations. The student work was fully integrated into the existing social studies curriculum. The academic year's work culminated in an excavation at the school site, where every student at Swann learned to excavate, identify artifacts, and examine features, along with a public archaeology event at the Swann's centennial celebration where the local community, and students and their families were able to take part in additional excavations.

**Taylor, William (University of Colorado, Boulder), Isaac Hart (University of Utah), Jamsranjav Bayarsaikhan (Max Planck Institute), Tumurbaatar Tuvshinjargal (National Museum of Mongolia) and Nicholas Jarman (Valles Caldera National Preserve)**

[244]

*Melting Ice, High-Altitude Hunting, and Horse Use in the Mongolian Altai*

Around the globe, a rapidly warming climate is exposing organic materials preserved in permanent snow and ice features. In western Mongolia, artifacts melting from ice features in the Altai mountains demonstrate a millennia-long record of the use of high-altitude zones for hunting of large game, particularly argali sheep, by ancient pastoralists. New discoveries reveal hunting technology and strategies as well as in-field processing choices and evidence of regular horse transport even at extreme altitudes. Our results demonstrate the significance of hunting even in specialized pastoral societies in ancient Mongolia, and indicate that, paired with plummeting wildlife populations, contemporary climate warming and ice loss poses a severe threat to pastoral resilience in Inner Asia.

Taylor, William [118] see Buckser, Sasha

**Teeman, Diane (Burns Paiute Tribe, C&H Dept.)**

[144]

*Moderator*

[221]

*Discussant*

Tejero, Andres [13] see Cifuentes, Gerardo

**Tejero, José-Miguel (University of Vienna), Olivia Cheronet (University of Vienna), Pere Gelabert (University of Vienna), Gerhard Weber (University of Vienna) and Ron Pinhasi (University of Vienna)**

[214]

*Assessing a Minimally Invasive Method for Ancient DNA Sampling of Paleolithic Bone and Antler Tools by Micro-CT Scan and Density Measurements*

Osseous objects are among the most frequent archaeological remains recovered from Upper Paleolithic (UP) sites. Their analysis is thus essential to obtain insights into crucial aspects of the Pleistocene hunter-gatherer's

lifestyle, including human subsistence, social behavior, prehistoric humans' practical/symbolic choices, and the human-animal interface. Given the critical importance of osseous tools to enhance our understanding of past human societies, their study has been improved in the last few years by combining archaeological and biomolecular (paleoproteomics and aDNA) methods. However, the latter generally implies a destructive sampling process, problematic for unique pieces like most Paleolithic osseous tools. Here, we apply a minimally invasive aDNA sampling method developed by Harney et al. for human teeth to an assemblage of 19 UP osseous tools from Iberia and the Levant. We have obtained aDNA, allowing us to identify the exploited animal taxa while assessing its impact on the integrity of both the macro-morphology and the inner structure of the pieces. We have demonstrated, by micro-CT and density measurements, that the macro-morphology, surface topography, and internal structure of objects remain broadly unchanged after sampling. Further analyses such as morphometrical, technical, genetic, radiometric, and other studies should thus not be affected by our aDNA sampling approach.

**Telep, Amanda (Indiana University of Pennsylvania)**

[18]

*An Investigation into the Archaeological Resources of Irishtown Gap Hollow*

In partnership with the South Mountain Research Corps, Indiana University of Pennsylvania (IUP) has had a unique opportunity to highlight archaeological resources on public lands. Amanda Telep, a second-year graduate student at IUP, received a grant from the South Mountain Research program to conduct an archaeological survey at the Jacob Keller sawmill site and adjoining homestead structures in partial fulfillment of her graduate thesis. The research aimed to highlight the industrial history of the South Mountain region by focusing on the role of the sawmill in the larger industrial landscape, by examining the products manufactured, the distribution and demand for the products and the social and economic status of the inhabitants at the site as well as their ethnicity. The results of this survey were compared to similar sites within the county. The results of this thesis also produced recommendations to the park on how to approach, preserve, and interpret archaeological resources within their property boundaries.

**Tellez, Alba (Suny Albany)**

[91]

*Tipología lítica para Cerro Jazmín, Oaxaca*

Se presenta la primer tipología de artefactos líticos de Cerro Jazmín, Oaxaca. Identificamos una industria lítica basada en sílex, con artefactos especializados. Logramos identificar las etapas del proceso de talla que se llevaban a cabo en el sitio. Se propone que la industria lítica para el periodo más temprano presenta menos estandarización mientras que para el posclásico se cuenta con una mayor uniformidad en los artefactos. En cuanto a la obsidiana, es una industria basada en navajilla prismáticas y núcleos de las misma.

Tennie, Claudio [232] see Ferar, Nolan

ter Brugge, Jeroen [116] see Van Gijn, Annelou

ter Schure, Anneke [56] see Kandel, Andrew

Terentis, Andrew [17] see Brown, Clifford

**Terlep, Michael, William Bryce (Southwestern Archaeological Resource Alliance) and Karen Harry (University of Nevada, Las Vegas)**

[180]

*Cave du Pont Revisited: New Excavations a Century after Nusbaum*

Cave du Pont is a Far Western Basketmaker shelter located on private lands within Cave Lakes Canyon, six

miles north of Kanab, Utah. Originally excavated in 1920 by Jesse Nusbaum, with artifact analyses by Alfred V. Kidder and Samuel J. Guernsey, Cave du Pont provided the first clear evidence that the Basketmaker archaeological culture extended west of the Colorado River. Nusbaum's excavations, reported in 1922, identified 31 slab-lined food storage cists and an abundance of perishable artifacts consistent with Basketmaker material culture. Currently, Cave Lakes Canyon is being developed into a resort and recreational getaway with plans for unguided tours of Cave du Pont. Unguided visitation may increase erosion of the loose sandy deposits and result in vandalism and artifact collection. As part of an ongoing project to mitigate potential adverse effects associated with public access to the site archaeologists are conducting new excavations and data collection at Cave du Pont. This presentation presents preliminary observations from renewed excavations of Cave du Pont a century after the publication of Nusbaum's work.

Terradas, Xavier [47] see Belmiro, Joana

### **Terry, Karisa (Central Washington University)**

[27]

*The Foundational Element of Mobile Land-Use Systems in the Initial Late Pleistocene–Early Holocene Adoption of Ceramic Vessels in the Transbaikal Region, Siberia*

Some of the earliest ceramic vessels worldwide were used by foraging communities in NE Asia (i.e., Japan, Russian Far East) by roughly 16,000 years ago (i.e., Iizuka 2018). Subsequently, in the Transbaikal region of eastern Siberia the earliest adoption of ceramics by 15,000 or 7000 cal BP (see Hommel 2017; Iizuka 2019; Terry 2022) is thought to have spread into the region through networks of interaction from the Russian Far East (i.e., Hommel 2018; Yanshina 2022). Here, behavioral comparisons are explored between several sites in the Transbaikal region with ( $N = 5$ ) and without ( $N = 6$ ) ceramics from this “transitional” period dating roughly 15,500–10,000 cal BP, during a time of relatively rapid fluctuations between warm and cold periods. Comparisons of fauna, lithic technology, symbolic representations, and dwellings indicate a stable behavioral system involving ephemeral camps and mobile land-use strategies regardless of the presence of ceramics. The additional use of ceramic vessels may have allowed intensification of land mammal and possibly fish extraction during unstable times. These mobile land-use strategies likely facilitated the interaction of foraging groups along river valleys connecting the Transbaikal region with the Russian Far East and the adoption of a new extractive technology into their existing behavioral system.

Terry, Karisa [27] see Biggs, Harley

Terry, Karisa [70] see Lubinski, Patrick

### **Thacker, Paul (Wake Forest University)**

[171]

*Debitage as Raw Material Resource: Understanding Olival Grande as a Paleolithic Place*

Lithic debitage attributes are critical for interpreting the open-air Upper Paleolithic archaeological site of Olival Grande in central Portugal. Fabric analysis, intrasite spatial patterning, and weathered surface features of artifacts indicate manifold site burial mechanisms and significant postdepositional processes at the hillslope location. Extraordinarily different reduction strategies are evident in the very large debitage assemblage suggesting long-term palimpsest formation. Yet the technological organization and decision-making evident in patterns of fracture types and edge damage can only be explained by the extensive reworking of discarded debitage by subsequent site visitors. This case study illustrates the interpretive limitations of the palimpsest concept and develops anthropological considerations of place for raw material procurement activities.

Thafer, Ahmad [171] see Macdonald, Danielle

Thafer, Ahmad [171] see Maher, Lisa

Thakar, Heather [68] see Daniels, James

Thakar, Heather [127] see Johnson, John

Thatcher, Jennifer [171] see Binning, Jeanne

**Thomas, Ariane (University of Iowa), Matthew E. Hill Jr. (University of Iowa), Chris Widga (East Tennessee State University), Martin Welker (Arizona State Museum, University of Arizona) and Andrew Kitchen (University of Iowa)**

**[203]**

*Body Mass Estimates of Dogs in North America by Geography, Time, and Human Cultural Associations*

Dogs of North America share a long history of interaction with humans, yet little is known about how humans managed their dogs prior to modern breeding practices that became popular during the sixteenth century. European colonists recognized a few indigenous dog “breeds” and described these dogs as primarily “wolf-like” in appearance and phenotypically variable in body size. In order to evaluate the claims that several discrete sizes of dogs existed prior to European colonization, we measured dog skeletal material recovered from archaeological sites in Iowa, Nebraska, and Kansas. We focused on specimens with known cultural associations that are well-accepted within the field of archaeology. Combined with publicly available data, we estimated dog body mass by inputting the values for each measurement into a regression equation generated from modern dog data. Our analysis shows that multiple dog body masses existed in North America, and we further explore this variation by comparing body mass estimates by time period, geography, and human cultural association. This work contextualizes these results within the broader theoretical scholarship that proposes that dogs as proxies for past human migration and other behaviors.

Thomas, Christian [63] see Pennanen, Kelsey

Thomas, Dayna [121] see Jaffe, Yitzchak

**Thomas, Jayne-Leigh (Indiana University), Dan Knudsen (Indiana University) and Rebecca Hawkins (Algonquin Consultants)**

**[111]**

*Modeling Mississippian Subsistence: Diet and Food Production at Angel Mounds, Indiana*

Agricultural research in archaeology has predominantly focused on the presence or absence of food refuse, dietary data from isotopic studies, or the origins of agriculture. Fewer studies exist that focus on how crops were actually grown and what yields would be needed to viably support a specific population, considering years of both surplus and scarcity. During the Mississippian period in the US Midwest, the cultivation of maize is discussed as a dietary focal point, with contributions from gourds, chenopods, and protein sources like terrestrial and aquatic fauna. However, studies surrounding maize in this region have focused on the timing and introduction in the archaeological record, potential ritual significance, and the relationship of maize reliance to political unification of local communities. In this paper, we apply mathematical modeling to estimate agricultural production at the Mississippian site of Angel Mounds in southern Indiana, USA, in 1200 CE.

Thomas, Jayne-Leigh [111] see Barzilai, Rebecca

Thomas, Jayne-Leigh [136] see Hawkins, Rebecca

Thomas, Jayne-Leigh [111] see Herrmann, Edward

**Thomas, Noah****[215]**

*Social, Material, and Symbolic Transformations of Value at the Margins of Colonization: A View from the Seventeenth-Century Metallurgical Terraces at Paa-ko (LA 162), NM*

Mining communities are often at the peripheries of colonial expansion. Yet, the material and social forms developed from such communities can profoundly affect colonial social and economic structures from local to global scales. The archaeological analyses of the metallurgical terraces at the Pueblo of Paa-ko allow for a perspective on the development of regimes of value, labor, and material meaning in the early colonial period of New Mexico. They also provide an avenue to explore how politically dominant cultural forms are challenged, selectively appropriated, and transformed. Tacking between local and global contexts, this paper explores how the construction of value in this community and others at the margins of colonial expansion had the potential to shape perceptions concerning value and wealth more broadly.

**Thomas, Suzie (University of Antwerp)****[14]**

*Discussant*

**Thomas, Suzie (University of Antwerp) and Anna Wessman (University Museum of Bergen)****[136]**

*Finder-Collectors: Untapped Potential for Collaborative Engaged Scholarship*

Avocationalists including metal detectorists can be defined as finder-collectors. This includes people who keep collections, including objects they have themselves found, but also possibly objects that they have acquired through purchasing, swapping, gifting, or by other means. This category expressly does not include people who loot but does include responsible and responsive stewards who currently, or in the future, have the potential to follow best practices for archaeological object conservation and documentation. In this paper, we discuss the results of object interviews, an ethnographic method where the finder-collectors talk about a set of specifically chosen objects while engaging with them during the interview. According to our interviews carried out in Flanders (Belgium) and Norway, most collected objects have a story and, to the finder-collectors, the objects often possess an emotional and mnemonic character—while they also talk to social situations, concerns about the fulfillment of research potential, and many other aspects, some of which are more surprising to us as archaeologists than others. As well as describing our research approaches and results so far, we discuss the possibilities for the future and explain why working with and researching finder-collectors remains a subfield with untapped potential.

**Thompson, Amy (University of Texas, Austin)****[142]**

*Chair*

**Thompson, Amy (University of Texas, Austin) and Gary Feinman (Field Museum of Natural History)****[142]**

*Inequality in the Maya Lowlands*

Assessing inequality using the Gini coefficient based on house size provides a standard metric for studying dynamic societal change across vast spatiotemporal contexts. Within a single geographic region, such as the Maya Lowlands, wealth inequities change over time as political systems vacillated over time between collective and autocratic forms of governance. Drawing on legacy data from pedestrian surveys, we measure house size and calculate the Gini coefficient at more than 60 Maya centers spanning from the Middle Preclassic (800–400 BCE) to the Late Postclassic (1200–1520 CE), and among subregions of the Maya Lowlands. We compare these data with previously reported Ginis from more than 30 Maya centers in a discussion of inequality through time and space as it articulates with shifting political systems and resource availability. The suite of Maya centers varies from small hamlets to large, powerful cities. Our evaluation of

inequality through time in the Maya region of Mesoamerica contributes to the larger patterns of differential access to resources and inequities through time as presented in this session.

Thompson, Amy [176] see Ploetz, Chris  
 Thompson, Amy [17] see Prufer, Keith  
 Thompson, Amy [165] see Richards-Rissetto, Heather  
 Thompson, Amy [73] see Schraub, Austin  
 Thompson, Amy [234] see Traxler, Loa

**Thompson, Jessica (Yale University) and Benjamin Davies (Yale University)**  
**[159]**

*Equity, Access, and the Privilege of “Best Practice” in Archaeological Fieldwork*

Technological advances in digital imagery, field recording, and mapping have transformed the ability of archaeologists to rapidly collect, store, and analyze large quantities of high-resolution field data. In spite of steadily lowering prices and broader consumer accessibility over the years, the costs associated with acquiring, maintaining, and training to use these technologies can remain significant. These costs may be justified in terms of “best practice,” or the ethics of recording the irreplaceable archaeological record at the finest detail feasible before it is gone forever. However, the ability to establish “best practice” comes from privileged access to resources such as funding, training, software, and other infrastructure. From a structural perspective, if technological solutions are incorporated into new standards of field data acquisition, it is not feasible to hold all archaeological practitioners to the same standards. It is therefore imperative to empirically justify their use, and then to facilitate equitable access to the necessary resources. Here, we simulate the costs associated with incrementally adding technological components to archaeological field projects (e.g., laptop computers, digital cameras, total stations) relative to their returns in data resolution, as a step in quantifying how crucial each one is to the overall success of a field project.

Thompson, Jessica [159] see Davies, Benjamin

**Thompson, Jordan (Washington State University)**  
**[126]**

*An Overview of Vitrophyre Use in North Central Idaho: 12,000 Years of Rock Knockin’ on the Lochsa*

Archaeological investigations in the 1990s defined the Clearwater River region of the southern Columbia Plateau as a unique cultural and archaeological entity, though it remains poorly understood. The Nez Perce have occupied this portion of north central Idaho since time immemorial. Excavations throughout ancestral Nez Perce country have revealed vitrophyre in at least 19 key sites dating back 12,000 years. Vitrophyre is a natural igneous glass, formed of pyroclastic flow deposits containing large-grain phenocrysts of ash and pumice. Much like obsidian, vitrophyre creates sharp cutting edges for tool production and retains a chemical signature that can be traced to a geographical point of origin. A combination of geochemical analysis, lithic analysis, and experimentation has provided an overview of this understudied resource and its uses. By comparing two known vitrophyre sources with archaeological samples through an ecological foraging model, vitrophyre use reflects both embedded procurement strategies and territorial restrictions of different groups since the initial occupation of the Clearwater River region. The results of the analysis, in tandem with ethnographic data, suggest a strong connection of the inhabitants of the Clearwater River region with Salish groups of the Bitterroot and Plains regions to the east.

Thompson, Jordan [179] see Holcomb, Justin

Thompson, Rachel [98] see Gonzalez-Tennant, Edward

**Thompson, Victor (University of Georgia)****[92]***Collective Action, Transport Costs, Watercraft Technologies, and the Engineered Ancestral Landscapes of Southern Florida*

Watercraft technologies have a long history in southern Florida. Archaeologists have recovered large vessels but historic documents also describe the Calusa utilizing complex ships able to transport large numbers of people. In addition to the sizable amount of labor that the people of the region invested in building such vessels, they also constructed canal systems throughout southern Florida. These canals not only facilitated movement within the bays and estuaries, but also connected the coast with a vast network of settlements in the region's vast interior river and wetlands systems. These canal systems required not only labor to build, but also considerable maintenance to keep them free and clear for navigation. Further, the incorporation of navigable rivers into this system presented additional challenges and required detailed knowledge of hydrological engineering. Here, I consider how these systems emerged through collective and cooperative institutions. Subsequently, I examine the degree to which these constellations of technologies and engineered landscapes formed a kind of armature for the emergence of regional political systems of the kind observed in the area in the sixteenth century.

Thompson, Victor [70] see Demyan, Marcela

Thompson, Victor [113] see Garland, Carey

Thompson, Victor [74] see Holland-Lulewicz, Jacob

Thompson, Victor [74] see Parbus, Brett

Thornton, Daniel [73] see Thornton, Erin

**Thornton, Erin (Washington State University), Daniel Thornton (Washington State University), Lucy Perera (Washington State University) and Jacklyn Rumberger (Washington State University)****[73]***Modeling of the Impacts and Sustainability of Ancient Maya Hunting: An Interdisciplinary Ecological and Archaeological Study*

The environmental impact of sizable Late Classic ancient Maya populations remains a persistent question in archaeology. To date, studies of ancient Maya environmental impacts have focused primarily on land-cover change and the conversion of forest to agricultural fields, orchards, and habitation areas. In contrast, few empirical studies have focused on the impact of the ancient Maya on local wildlife populations. The current interdisciplinary study thus combines archaeological settlement data and ecological modeling of prey depletion to determine the potential extent of hunting impacts around ancient Maya communities. Our approach allows for the manipulation of parameters to generate and test hypotheses regarding how system properties (e.g., human population size, archaeological site distribution, hunting frequency and distance, species growth rate, and prey selection) influence the spatial imprint of ancient Maya hunting. Through this process, we can identify thresholds or tipping points beyond which hunting of particular species would likely have become unsustainable, and the combination of parameters that give rise to such behavior. This is key to understanding the range of possible scenarios that would have led to unsustainable use of wildlife resources in the past.

**Throgmorton, Kellam (Crow Canyon Archaeological Center)****[16]***Changes in the Temporality of the Landscape during the Chacoan Period in the American Southwest*

Chaco Canyon is the center of one of the best known archaeological cultures in North America, and its influence spread widely across the northern US Southwest between AD 850 and 1150. Because of the well-preserved road segments, shrine networks, earthworks, and petroglyph panels associated with the Chacoan

culture, landscape has been an important theme in Chacoan studies. Indigenous literature addressing nature/culture refines the definition of ecology to include human-made modifications to the landscape and describe the relational identity that exists between people and place. This paper draws on the ethnology of Eastern and Western Pueblo peoples to describe a continuum of landscape temporalities in the Chacoan era. The relationship between landscape temporality and identity leads to the conclusion that dynamic changes in the landscape wrought by Chacoan expansion had far-reaching consequence for residents of the American Southwest. Using landscape modifications, they rewrote local histories and enfolded many communities within a developing Chacoan polity.

Throgmorton, Kellam [90] see Wilshusen, Richard

**Thulman, David (George Washington University)**

[197]

*Late Pleistocene Deposits in Lake George, Florida*

In 2006, a Suwannee Paleoindian site was reported by local collectors in Lake George, Florida's second largest lake. Although destroyed, the site changed our understanding of Paleoindian distributions in the state. Since then, the Archaeological Research Cooperative has conducted surface and sub-bottom surveys of the lake looking for other early landforms and sites, funded by the state of Florida. In 2019, we found several surfaces in cores with preserved fauna and flora, dating to ~14,000, 18,000, and 20,000 cal years BP. The youngest dates are essentially contemporaneous with the pre-Clovis dates at Page-Ladson. These findings were unexpected and reveal a more complex paleoenvironmental and potential occupation history for the lake.

Tian, Cindy [181] see Blondin, Émilie

**Tibbits, Tawny (Chadron State College), Marieka Brouwer Burg (University of Vermont) and Eleanor Harrison-Buck (University of New Hampshire)**

[115]

*The Second Chapter: Further Analysis of Granite Ground Stone Tools from the Belize River East Archaeology Project, 2015–2022*

Granite was a preferred raw material for ground stone tool production in many parts of the Maya Lowlands. However, granite outcrops are spatially restricted within the Maya Mountains of Belize, and access to this material was limited. The movement of raw and/or finished tools would have required various mechanisms of movement, trade, and exchange to obtain. We use handheld X-ray fluorescence to trace the distribution patterns of granite ground stone tools as they moved from source to deposition location in the Lower Belize Watershed. Here, we present new geochemical sourcing data on granite ground stone artifacts recovered by the Belize River East Archaeology (BREA) project since 2015. The chemical signatures of these artifacts add breadth and depth to our current understanding of granite provisioning at a regional scale. Further, we discuss the distribution of granite versus other raw materials used in ground stone tool production throughout Belize and outline a set of research questions needed to further explore the dynamics of the ground stone tool economy.

**Tichinin, Alina (California State University, Chico)**

[76]

*A Multi-technique Approach to Investigating Reliance on Big Game Hunting in the Northwestern Great Basin*

Multiple archaeometric techniques were used to inform on prey acquisition in the Archaic to Terminal Prehistoric periods (1450–4700 cal BP) in the northwestern Great Basin. Stable isotope analysis, cementum increment analysis, and AMS radiocarbon dating were performed on artiodactyl teeth excavated from Paiute Creek Shelter (PCS) in Nevada's Black Rock Desert. While cementum increment analysis has been used for

decades to identify the season of death from dental remains, the addition of stable isotope analysis of oxygen and carbon provides further insight into patterns of prey capture and ranking according to optimal foraging theory. Radiocarbon dates indicate the shelter's use spans just prior to and through the contact period in northwestern Nevada. Based on the preliminary data, there is no significant pattern seen between the season of death and stratigraphic layer, indicating no change in subsistence behavior over time. The C and O isotope data indicates no change in seasonal migration over time, also supporting the idea that there is no need for a change in subsistence choices due to changes in animal behavior or climate.

Tierney, Jessica [15] see Kielhofer, Jennifer

**Tiesler, Vera (Universidad Autónoma de Yucatán)**

[11]

Chair

**Tiesler, Vera (Universidad Autónoma de Yucatán)**

[58]

*In the Wake of Collapse: Eastern Mesoamerican Body Modifications and Identities during the Ninth and Tenth Centuries CE*

Most Eastern Mesoamerican populations are known for their remarkable diversity and sophistication in dental works and head shaping procedures during the Classic period. Here, these permanently inscribed body modifications have come to light in thousands of burial explorations surrounding the Mesoamerican Gulf Coast, Northern Yucatán, the Central Petén, and its southeastern peripheries. While mothers would model their baby's head in different ways, teeth could be filed or inlaid any time past adolescence. Gravitating away from familiar discussions of physically inscribed Maya identities, I take a more overarching look at the shifts in the looks of heads and teeth under the backdrop of crisis, political collapse, and relocation. Systematic coverage in the regional skeletal record upholds discussions of their potential sociocultural and ethnic underpinnings. While the trends toward and after the end of the Classic period highlight resilience among some few Lowland Maya remnant populations, the overwhelming evidence suggests that both body practices ceased to serve formerly distinctive regional group identities and, less so, glamorous display. Late Mesoamerica's increased interconnectivity is hinted at by those population segments with incrustrated teeth and top-flattened heads. Their propagation across Mesoamerica and beyond provides food-for-thought on an internationalized post-collapse era.

Tiesler, Vera [204] see Medina, Isabella

Tiesler, Vera [58] see Ortega, Allan

Tiesler, Vera [58] see Sedig, Jakob

**Tisdale, Dhillon and Jonathan Flood (NPS: Klondike Gold Rush National Historical Park)**

[178]

*The Bark Canada, a Gold Rush Legacy at Risk*

The bark *Canada* was a cargo ship that was grounded near Skagway, Alaska, in 1898. The site has been a local tourist destination for over a century but has suffered over time from repeated exposure at low tides and altering environmental conditions. The purpose of the current project was to plot the history of the ship's degradation, identify specific areas of concern, and forecast future changes to the site. A review of literature concerning the original grounding of the vessel, as well as previously conducted documentation of its condition was used to create an estimated trajectory of integrity loss over time. Photos and videography were used to record its current conditions, and calipers and tape measures were used to measure dimensions of key features as benchmarks. To plot what future changes may occur at the site, it was observed at various low tide markers to monitor how much of the wreck was exposed at each. Additionally, a dramatic decrease in site integrity can potentially be linked to a recent trend in shifting underwater

conditions. Therefore, an analysis of water quality and changes in salinity over time was used to predict how changing conditions may impact the integrity of the site.

**Tlapoyawa, Kurly (Chimalli Institute of Mesoamerican Arts)**

[40]

*Discussant*

**Todd, Lawrence (GRSLE)**

[170]

*Discussant*

**Todd, Lawrence (GRSLE) and Daniel Dalmas (University of Utah)**

[94]

*Wilderness, Wildlife, and Management Misconceptions: Archaeology in Washakie Wilderness NW Wyoming*

Since 2002 the Greybull River Sustainable Landscape Ecology (GRSLE) project has undertaken an artifact-based, landscape-scale inventory in the eastern Greater Yellowstone Ecosystem, on the Shoshone National Forest in NW Wyoming. Much of the project has been conducted in the Washakie Wilderness and has focused on elevations >2,500 m. When the project began, both the archaeological community and federal land managers tended to operate under the assumption that past human use of these remote and high elevation landscapes would have been largely ephemeral and left a sparse archaeological record. Over the 21 field seasons, GRSLE has documented over 230,000 artifacts in multiple inventory blocks totaling 3,931 ha. Diagnostic artifacts range from Clovis and Folsom points to glass trade beads and metal arrow points. Archaeological data clearly demonstrate that since the Late Pleistocene, humans have been a key component of these wilderness areas with impacts to most other components of the ecosystem. Rather than yielding a sparse, ephemeral record, the project documents the long-term ecological connection of humans with areas today considered pristine or untrammled and strongly suggests that management planning that omits human engagement with the system is based on a serious misconception of past landscape dynamics.

Todd, Lawrence [170] see Widga, Chris

**Tokovinine, Alexandre (University of Alabama)**

[186]

*Discussant*

**Tokovinine, Alexandre (University of Alabama)**

[85]

*A Bath for 8,000 Gods: Atij and Similar Expressions on Classic Maya Monuments*

Maya hieroglyphs are an invaluable source of data about the Classic period religion. However, when it comes to sweat baths, only a small subset of archaeologically investigated structures contains inscriptions. Therefore, any attempt to study this particular aspect of Maya ritual life should consider a broader corpus of texts that no longer have a clear archaeological connection to sweat baths. This presentation considers the spatial and chronological distribution of references to “bathing” and related expressions such as “strengthening” in Classic Maya inscriptions. The author’s goal is to test the assumption that these references evoke rituals taking place in sweat baths, both “real” and “symbolic.” If true, these references may be used to identify the discourse linked to sweat baths. The investigation also explores the range of imagery possibly evoking sweat bath rituals, including the less studied corpus of graffiti.

Tokovinine, Alexandre [95] see Alexander, Clara

Tokovinine, Alexandre [127] see Dober, Joseph

Tokovinine, Alexandre [206] see Estrada-Belli, Francisco

Tokovinine, Alexandre [154] see Hannold, Cynthia

Tom, Enid [209] see Lowe, Kelsey

**Tom, Rosie**

[144]

*Discussant*

Tomac, Goran [29] see Martinoia Zamolo, Valentina

**Tomazic, Iride (University of Michigan), Amy Nicodemus (University of Wisconsin, La-Crosse) and John O'Shea (University of Michigan)**

[218]

*Heavy Metal Animals: A Preliminary Study of Anthropogenic Pollution in Animals from the Southern Carpathian Bronze Age*

In the past archaeology rarely played a role in the discussion of anthropogenic pollution. This lack of study is mainly due to the skepticism around the accurate representation of heavy metals in archaeological material as a result of diagenetic processes. In this study, we present preliminary results of a systematic selection of animal second and third mandibular molar enamel from three Bronze Age sites with evidence of metallurgical production from the Southern Carpathian basin analyzed by ICP-MS and LA-ICP MS. The results showed different levels of heavy metals according to animal species and habitat, thus offering an opportunity to investigate questions of pollution in buried archaeological material. However, the analysis with LA-ICP-MS, while extremely useful, remains an expensive method. This research also shows that an effective sampling strategy and systematic sample preparation with ICP-MS can offer a much more affordable option to investigate questions about pollution.

**Tomczyk, Weronika (Stanford University)**

[139]

*Discussant*

[139]

*Chair*

**Tomczyk, Weronika (Stanford University) and Claire Ebert (University of Pittsburgh)**

[245]

*The Many Lives of Wari Dogs: A Summary of Zooarchaeological and Isotopic Research*

The widespread perception of the dog as humans' closest companion species allows their remains to be used as proxies for human diet and mobility patterns. But these highly social animals held their own variable social and economic roles. Therefore, dog remains can provide information on the organization of animal management systems in past complex societies. Considering dogs as members of multispecies assemblages, especially pastoral herds, this study investigates the roles of the dogs recovered at archaeological sites associated with the Wari Empire. The combination of standard zooarchaeological methods, multi-isotopic (C, N, O, and Sr) analyses of the selected samples, and literature review reveal that the Wari dogs' life trajectories were mainly local but not uniform. They lived as hunters/pastoral dogs, lap dogs, or ignored scavengers. Many were also buried among humans, suggesting important ideological functions. The examined dog remains also include three individuals tentatively identified as ancestors of the Peruvian Naked Dog, an indigenous Andean breed today treated as a Peruvian national symbol. This study argues that the Wari dogs' osteobiographies reveal not merely their dependence on humans but also complex multispecies relationships and the Wari agents' economic focus on local environmental resources.

Tomko, John [183] see Powis, Terry

**Toohey, Jason (University of Wyoming)****[164]**

Chair

**Toohey, Jason (University of Wyoming)****[164]***Experiencing Monumentalism in the Late Archaic Cajamarca Highlands of Peru*

A group of people came together in the early third millennium BCE to construct a large circular plaza bounded by concentric walls of free-standing megaliths. This Late Archaic period, 18 m diameter plaza is located near the summit of the site of Callacpuma in the Cajamarca Basin and has been the subject of mapping and excavation since 2018. This paper presents new radiocarbon dates for the initial construction of the plaza. This is the first plaza of its kind to be published from the northern highlands and may have been the focus of emerging systems of corporate identity in the region prior to the Early Huacaloma period. This paper will contextualize the construction and possible subsequent use of this space within our current understandings of life in the Late Archaic highlands as well as the broader circular plaza tradition that began at this time across much of the western central Andes. Following Moore's groundbreaking work on proxemic and bodily experiences of monumental places, this paper seeks to illuminate the scale of lived corporate action in and around the Preceramic Callacpuma plaza.

**Toombs, Garrett****[42]***If It Looks Like a Scraper? Identifying Artifact Function through Experimental Archaeology*

Lithic artifact functions are often determined by the form of an artifact rather than by an analysis of functional characteristics. Some ways in which artifact function can be determined include experimental archaeology, use wear, and paleoethnobotanical analyses. Determining artifact function provides information about the types of tasks people performed, including activities involving materials which are unlikely to preserve in the archaeological record. Such data are valuable for our understanding of day-to-day activities and past economic organization. This poster addresses the function of four unifacial chert tools from the Classic period (AD 250–830) Maya city of El Perú-Waka', Guatemala. Tool analysis employed includes experimental replication, use-wear analysis, and paleoethnobotanical analyses to ascertain potential functions. Preliminary analyses indicate that some of the tools were used for processing soft organics. Such materials rarely preserve in the lowland Maya region, making it hard to study these resources that were of economic importance. This study adds to our understanding of Classic Maya economies through examinations of the lithics that were used to process organic materials.

**Tormey, Blair (Western Carolina University) and Paul Martin (Martin Archaeology Consulting)****[174]***Finding Lost Souls: Mapping and Preserving Historic African American Gravesites in Western North Carolina Using Human Remains Detection Canines and Ground-Penetrating Radar*

Throughout the American South, it is not uncommon for historical African American cemeteries and burial sites to possess little to no written records, complicating preservation efforts. Since 2010, researchers and students at Western Carolina University, in cooperation with Martin Archaeology Consulting, have utilized human remains detection (HRD) canines in concert with ground-penetrating radar (GPR) as noninvasive resources in archaeological investigations, particularly in mapping historical cemeteries. To date, the African American Gravesite Preservation Project at Western Carolina University has documented over 100 gravesites at five cemeteries in western North Carolina, located in Hayesville, Brevard, and the Great Smoky Mountains National Park. In addition, a new effort is underway to locate and document burial sites of incarcerated African American laborers buried along railroad tracks during the construction of the railroad between Old Fort and Swannanoa in the 1870s. All too often, African American cemeteries are poorly documented, poorly preserved, and neglected. It is critical for a truly democratic nation to acknowledge this injustice and make every effort to recognize the lost souls of its history. Along with traditional GPR surveys,

disciplined searches by trained HRD canines have been a critical component in mapping and preserving these important historic sites.

**Torquato, Melissa**

[137]

*Nuts for Nuts: Assessing Hypotheses of Nut Preparation and Cracking Experiments*

[WITHDRAWN]

Torquato, Melissa [137] see Keevil, Trevor

Torquato, Melissa [137] see Otárola-Castillo, Erik

**Torras Freixa, Maria (Boston University)**

[189]

*Chair*

**Torras Freixa, Maria (Boston University), Natalia Moragas (Universitat de Barcelona) and Alessandra Pecci (Universitat de Barcelona)**

[189]

*Reviewing Urbanization and Deurbanization at Teotihuacan*

Urbanization is a global phenomenon with regional and temporal variations. By 2050, over two-thirds of the world's population will live in cities. Nevertheless, there is also the opposite process—deurbanization and the emergence of abandoned urban areas. The ancient city of Teotihuacan offers us a research framework to understand both processes because we can trace urban early development and planning but also analyze collapse, abandonment, and ruralization. The primary aim of this contribution is to explore the possibility of discussing and comparing similarities and dissimilarities between both processes in order to explore common patterns. First, we are going to review the formation period of Teotihuacan settlement (1–250 CE) through the analysis of the architectural and material culture that has been recorded in dispersed literature (rescue excavations and archaeological projects). Additionally, we are going to explore the city's decomposition after 550 CE. Thus, reviewing urbanization and deurbanization at Teotihuacan will give us hints into how these processes imprint the archaeological record and how comparable they are.

Torras Freixa, Maria [25] see Moragas, Natalia

**Torres, Christina (UC Merced)**

[151]

*Recovering Lost Excavations: Reconstructing Burials from the University of California Excavations at Guatacondo, Chile (1967–1969)*

As part of a Chile-California accord in the 1960s, UCLA faculty, graduate students, and a number of Chilean archaeologists excavated the site of Guatacondo. This relationship ended abruptly following the schism of US/Chile relations pursuant to the election of Salvador Allende. At that point, Dr. Meighan returned to his position at UCLA, bringing with him field notes, photographs, slides, and archaeological material, while the majority of the collection was left to the Museo Nacional de Historia Natural in Santiago. This situation where collections are lost and dispersed among collecting institutions was common in the nineteenth and twentieth centuries. The unfortunate consequence of these practices is that many of these legacy collections are lost, unexplored, and chronically understudied. Here, I present an overview of the Guatacondo material, exploring the intersection of cultural differences, politics, and collection practices. Specifically, the notes detail the burial of a woman (cataloged as 27a) whose remains have since been lost and whose burial is particularly abundant and interesting. I focus specifically on this grave from the Guatacondo cemetery, attempting to reconstruct this burial from field notes, drawings, and photographs. This lens helps us consider the archaeological information that can be gleaned from records of earlier excavations.

**Torres, John****[192]***Indigenous Archaeology: California's AB52 and Its Impact*

NAGPRA empowered tribes to repatriate the remains and sacred objects of their ancestors. As a result, a movement developed and Indigenous archaeology was born. It has been with us for nearly 30 years now and some important benefits have resulted, especially in terms of interpreting archaeological data through an Indigenous lens. An amendment to the California Environmental Quality Act, Assembly Bill 52, has taken empowering tribes to a new level. Along with biologists, geologists, archaeologists, paleontologists, etc., tribes are now at the table while creating mitigation plans to impacted resources. These new Tribal Cultural Resources not only include archaeological sites, features, and objects but also tribal stories related to landscapes, medicine collection areas, hills, caves, waterways, etc. The impact has not only added to the interpretation of archaeological data but some tribes are actually collecting, analyzing, and curating their material culture of their ancestors directly. This paper will explore how this shifting paradigm has impacted development, tribe/archaeologists relations, and cultural resources.

**Torres, Josh (National Park Service)****[4]***Discussant*

Torres, Mariela [59] see Uribe, Mauricio

**Torrescano-Valle, Nuria, William Folan (Universidad Autónoma de Campeche) and Joel Gunn (University of North Carolina, Greensboro)****[204]***Environmental History of the Petén Campechano*

Paleoenvironmental inferences are based on pollen and geochemical data from sediment cores collected in Lakes Silvituc and Uxul, and Oxpemul Reservoir, near three archaeological sites that supported agricultural activity between ca. 900 BC and AD 750, under the control of the Kaan Dynasty. These sites show patterns similar to those in sediments from Lake Petén Itzá, northern Guatemala, but different from records from the northeastern of the Peninsula. Patterns of increasing and decreasing relative abundances of maize and other crops pollen reflect changes with respect to their cultivation and importance. High clay and gypsum content in the sediment may be related to deforestation, agriculture, and intervals of greater rainfall. Changes in sediment elemental concentrations were associated with droughts and human activities during the Classic period. The Classic droughts were more severe and prolonged than those of the Preclassic and thus had a greater impact for inhabitants of the Petén Campechano, which led to a cultural collapse by the seventh century, whereas settlements farther north on the Yucatan Peninsula persisted until the tenth century.

**Torres Morales, Genesis (University of California, Riverside), Celeste Gagnon (Wagner College), Gabriel Prieto (Florida University) and John Verano (Tulane University)****[134]***Understanding Vertebral Anomalies and Growth Patterns during the Late Intermediate Period (AD 1000–1470) in the Huanchaco Bay Area, Peru*

The mass sacrifice of Chimú children in the Moche Valley has become the largest event in the world. Two mass occurrences were discovered at the sites of Huanchaquito Las Llamas (HLL) and Pampa la Cruz (PLC). At PLC the sacrificial events date to the Late Intermediate period (AD 1000–1470). This research explores birth defects of the lumbosacral spine that affected one in every 10 of the 121 Chimú individuals analyzed at PLC. In addition, we explore whether these are correlated with growth disruptions. The main objective of this presentation is to contribute to the literature of relatedness and birth anomalies in the Andes. We analyzed the vertebral column to understand whether sacralization or lumbarization were present among

each individual. The fusion patterns of epiphyses and long bone measurements were observed and compared to dental eruption age to understand whether there were growth disruptions among the sacrificed individuals that present defects to their lumbosacral spine. Overall, this research is important in helping us understand the heterogeneous groups of individuals drawn from multiple regions that were chosen for sacrifice in the Huanchaco Bay area.

**Torvinen, Andrea (Arizona State University)**

[83]

*Discussant*

Torvinen, Andrea [216] see Michelaki, Kostalena

**Tostevin, Gilbert (University of Minnesota)**

[240]

*Discussant*

[240]

*Chair*

**Tostevin, Gilbert (University of Minnesota)**

[212]

*Measuring Intensity: Harold Dibble's Contributions to Paleoanthropology and Specifically to the Measure of Site Occupational Intensity*

Harold Dibble's contributions to Paleolithic archaeology are numerous. Of the two contributions that I feel had the largest impact, the first is the intensity of energy Dibble brought to every endeavor, particularly to broadening the application of rigorous empiricism to the archaeological record. He did this by example, challenging many of our cherished assumptions about human behavioral evolution through the demand for empirical evidence (i.e., Neanderthal burial, the desired end-product fallacy, etc.). His efforts at spreading a more scientific approach to the Paleolithic did not stop at creating more "mini-me's" as he would say—i.e., the training of his own graduate students—but also included devoting considerable energy to the training of other young scholars along the way, including myself. The second contribution for which Dibble's career will be remembered is his research on measuring site occupational intensity. Whether through the Middle Paleolithic scraper reduction model as applied across Bordian facies and paleoenvironmental contexts or the dynamic modeling of the directional changes in core reduction as blank length decreases, Dibble laid the groundwork for many of the modern quantitative methods of measuring occupational duration, raw material exhaustion of tools and cores, and operational sequence fragmentation.

Tostevin, Gilbert [240] see Cooper, Aspen

Tostevin, Gilbert [240] see Mallol, Carolina

Tostevin, Gilbert [240] see Marojevic, Vasilije

Tostevin, Gilbert [240] see Monnier, Gilliane

Tostevin, Gilbert [240] see Morin, Eugene

Tostevin, Gilbert [240] see Pajovic, Goran

Tostevin, Gilbert [240] see Porter, Samantha

**Totsch, Jessica (University of Missouri)**

[250]

*GIS and Ancient Infrastructure: Modeling Water Distribution from the Aqua Augusta in Pompeii, Italy*

Understanding access and distribution of resources is a key component of archaeological research. Tools such as Geographic Information Systems (GIS) can be instrumental for modeling and understanding resource use in the ancient world. The incredibly well-preserved remains of ancient Pompeii offer an excellent case

study for modeling urban infrastructure and the distribution of aqueduct water throughout the site. Pompeii's water-supply system consisted of water towers (to maintain pressure) and a network of lead pipes. Using GIS, a least-cost pathway model was created to show the location and placement of the lead pipes if the system had relied solely on changes in elevation across Pompeii to move the water more efficiently. This model was compared to the location of extant lead pipe on the surface of Pompeii using survey data collected during the 2022 field season. The goal of this project was to determine if the pipes followed a least-cost pathway or if their locations were constrained due to architectural and sanitation features such as existing structures, sidewalk placement, and sewage pits. Understanding the functional aspects and physical limitations of Pompeii's water-supply system has implications for urban planning and infrastructure in both ancient and modern contexts.

Tourtellotte, Perry [141] see Chang, Claudia

**Townend, Arthur**

[177]

*Barree Forge: A Pennsylvania Forge Town*

This thesis proposal considers the Barree Forge and Furnace site located at the Greene Hills Methodist Camp near Alexandria, a town in Huntingdon County, Pennsylvania. The manufacturing structure participated in Pennsylvania's Juniata Iron District as one of the top producers of iron throughout the nineteenth century, reaching peak production during the 1860s and 1870s before petering out during the 1880s. While the ruins of the furnace feature prominently, archaeological work conducted around this structure sought the location of destroyed portions of the building, including the forge itself. This thesis seeks to answer questions addressing the livelihood of workers in nearby tenement housing as evidenced by their material culture as opposed to the manufacturing of iron in the nearby forge, adopting a Marxist theoretical framework to interpret the archaeological record. As such, research will take place to the west of the forge to uncover potential worker housing structure foundations beneath the current landscape. Identifying potential housing will be conducted using ground-penetrating radar (GPR) to locate potential cultural anomalies, followed by ground-truthing those anomalies to determine the presence and function of potential structures, and then determine the living conditions of residents in relation to Barree Forge through artifact assemblage analysis.

**Towner, Ronald (Tree-ring Lab, University of Arizona) and Stephen Uzzle (Tree-ring Lab, University of Arizona)**

[25]

*Landscape Dendroarchaeology: 150 Years of Human/Environment Interaction in the Cebolla Creek Drainage of Western New Mexico, USA*

Landscapes tell stories. They contain evidence of past cultural and environmental change and the relationships between the two. Dendroarchaeology—the use of tree-ring data from past human activities—is uniquely positioned to provide the fine-grained temporal resolution necessary for understanding these relationships. This paper examines 150 years of multiethnic land use and environmental change in the Cebolla Creek drainage of western New Mexico using dendroarchaeological, documentary, and oral history data. Hispano, Navajo, and Anglo populations all impacted this landscape in different ways. Thus, the landscape we see today is markedly different than the one the Acoma and Zuni people depopulated in the 1300s.

Towner, Ronald [48] see Kessler, Nicholas

Toyne, J. Marla [73] see Haynes, Hannah

Toyne, J. Marla [45] see Pytleski, Hannah

Trabert, Sarah [169] see Bethke, Brandi  
 Trabert, Sarah [151] see Hollenback, Kacy

Trampota, Frantisek [3] see Kvetina, Petr

**Tran, Justin (Exploring Solutions Past)**

[165]

*Chair*

**Tran, Justin (Exploring Solutions Past), Anabel Ford (University of California, Santa Barbara) and Sherman Horn (University of California, Santa Barbara)**

[165]

*Modeling the Milpa-Cycle: A GIS-Based Approach to Envisioning Ancient Maya Land Use and Traditional Agricultural Practices*

Traditional ecological knowledge from living Maya farmers informs us of a storied heritage of agricultural production within the tropical Maya lowlands that traces its lineage to the development and height of ancient Maya civilization. In studying the Maya milpa-cycle, a 20-year land-use system integrating both managed tropical forests and polycultural milpa, or cultivated fields, we can explore the various means by which the provisioning of Maya populations was conducted. Utilizing geographic information systems in conjunction with remote-sensing and archaeological settlement data, a spatial model of a milpa-cycle environment can be constructed within the context of real-world Maya settlements. This paper presents the base methodology behind creating such a model per the expectations and limitations of Maya agriculture, accounting for conditions such as erosion and architectural presence. Furthermore, we demonstrate the capability of the model to generate spatial data that aids in evaluating agricultural production and envisioning traditional land-use distribution. The model thus facilitates further analysis of the ways in which the ancient Maya negotiated their landscape across a variety of environments spanning the Maya lowlands.

Tran, Justin [165] see Horn, Sherman

Travers, Laurine [21] see Spinelli Sanchez, Océane

**Traxler, Loa (University of New Mexico)**

[110]

*Discussant*

**Traxler, Loa (University of New Mexico), William Fash (Harvard University), Ricardo Agurcia Fasquelle (Asociación Copán), Amy Thompson (University of Texas, Austin) and Chris Ploetz (University of Texas, Austin)**

[234]

*Documenting Archaeological Tunnels within the Copan Acropolis: Advances in Architectural and Geospatial Recording for Conservation*

Investigations within the Copan Acropolis have provided an unprecedented source of data bearing on Copan's origins as the capital of a Classic period Maya kingdom. The excavations conducted over years by multiple research programs in partnership with the Honduran Institute of Anthropology and History resulted in extensive tunnel exposures of stratified masonry architecture, representing the setting for the historical succession of rulers, their extensive courts, and dynamic political affairs. In recent years, the Copan Acropolis has sustained increasing seasonal impacts from hurricanes and other climate fluctuations. Decorated stucco and masonry facades of structures buried beneath the final phase of Temple 16 have experienced deterioration, and the preservation of sculpted iconographic panels and elaborate ornamentation has high

priority in ongoing efforts by collaborating projects. Concerns for structural stability also challenge architectural conservation, and recent documentation efforts are helping to support the evolving program of architectural preservation within the Copan Acropolis. Using innovative technologies—including ground-based and handheld lidar combined with high-precision total station survey—collaborating projects are able to document, model, and analyze the changing conditions within the excavated tunnel network beneath Temple 16 and to contribute to conservation and preservation strategies at this World Heritage site.

Traxler, Loa [176] see Ploetz, Chris

Treadway, Amber [201] see Huster, Angela

### **Treffel, Elodie**

**[85]**

*Geografía sagrada en Naranjo: Relaciones simbólicas entre cerros, cuevas y temazcal*

Por medio de esta presentación, intentamos entender y considerar la importancia ritual y simbólica de un temascal Preclásico ubicado en la ciudad de Naranjo, Petén, Guatemala. Trataremos este tema a partir de la ubicación del temazcal dentro del paisaje sagrado del epicentro monumental de Naranjo y de sus conexiones simbólicas con los cerros y cuevas de este paisaje. También preguntaremos sobre el papel “ideológico y político” de este antiguo temazcal durante los periodos posteriores, es decir durante la época Clásica.

### **Trejo Ordoz, Alondra (Grupo de Desarrollo Reproductivo y Apomixis, UGA, LANGEBIO, CINVESTAV-IPN) and Oswaldo Camarillo Sánchez (Escuela Nacional de Antropología e Historia)**

**[247]**

*Los señores de la Casa del Mendrugo, Puebla: Tras los pasos de su vida a partir de los dientes*

Los cráneos decorados de nueve hombres y una mujer del México Antiguo atestiguan una compleja red social y cultural que trasciende hasta nuestros días. Al no contar con un registro arqueológico de su hallazgo, los análisis óseos, dentales, gráficos, de manufactura, tafonómicos y arqueométricos, son valiosos puentes de conocimiento que permiten reflexionar sobre los escenarios históricos a los que pertenecieron estas personas. A partir del análisis morfológico y morfométrico dental de estos diez señores, reflexionamos y nos aproximamos a una pequeña parte interpretativa sobre la afinidad biológica y contexto histórico al que pertenecieron. \* La presentación incluye imágenes de huesos humanos decorados.

### **Triadan, Daniela (University of Arizona) and Takeshi Inomata (University of Arizona)**

**[17]**

*Creating a New World: Large-Scale Landscape Modifications at Aguada Fenix, Mexico*

The recently discovered site of Aguada Fenix in eastern Tabasco, Mexico, is one of the largest monumental constructions in Mesoamerica. It dates to the beginning of the early Middle Preclassic, around 1100 BC. The main complex consists of a rectangular plateau with an E-Group at its center and is delimited by 20 large edge platforms. In addition, the overall constructions and modifications at the site include another very large modified artificial mound or plateau, a series of causeways and reservoirs, and extensive water management features and shoreline alterations of a large lagoon. This complex represents an altered landscape of a scale and complexity that was previously unknown for this region. The people who built Aguada Fenix thus literally created their own environment.

Trindade, Beatriz [55] see Klokler, Daniela

**Trinidad-Rivera, Gelenia (New York University)****[65]***Interweaved Stories of Resistance: A 1985 Ethnographic Collection in Puerto Rico*

In December 2019, the University of Puerto Rico's Museo de Historia, Antropología y Arte, received as a donation the Waiwai Ethnographic Collection (CRGW), which has survived multiple natural disasters. The CRGW was created by the Centro de Investigaciones Indígenas de Puerto Rico (CIIPR) as the result of an ethnographic expedition undertaken in 1985 in Guyana, South America. Its purpose was to gather information associated with the Waiwai people, direct descendants among the first inhabitants of the Caribbean. The CRGW holds objects that resemble those produced by the first inhabitants of the Caribbean, making it the only collection of its kind known in Puerto Rico. After the accessioning, rehousing, and registration process was completed, a research project focused on ethnoarchaeology was conducted. Photographs were digitized, a database of the collection's associated documentation was created, and frottage of the diverse patterns related to its basketry and textiles was recorded. The methodological approach focused on iconographic and historical analysis of photographs, the survey of weave patterns in perishable objects, and an analysis of ethnographic and archaeological collections. The importance of non-invasive research with archaeological and ethnographical collections sheds light on creating narrations that visibilize the historical networks in which the Caribbean lies today.

**Tripcevich, Nicholas (UC Berkeley), Scott Byram (UC Berkeley), José Capriles (Penn State University) and Calogero Santoro (Universidad de Tarapacá, Chile)****[177]***Geophysics in the Hyperarid Atacama: Assessing Features among Fossil Channels, Paleosols, and Lithic Dispersions at Quebrada Mani, Chile*

In the hyperarid core of the Atacama Desert in northern Chile, dozens of Terminal Pleistocene archaeological sites have been identified in an area that previously held seasonal surface water channels and a riparian landscape. These sites shed light on the early peopling of western South America because the sites have had little disturbance or conflation with later Holocene components due to the ensuing extreme aridity at the onset of the early Holocene. We present results from geophysical research carried out in 2018 at the area of Quebrada Mani where archaeological features distributed along east-west fossil stream channels that transported Andean water and sediments west toward pluvial basins have been dated to between 12.5 and 11.2k cal BP. The hyperaridity has also led to extraordinary preservation of a riparian corridor where horse, ground sloth, camelid, and rodent remains are present along with extensive botanical remains and concentrations of lithics. In this poster we assess some of the challenges in interpreting the past landscape using geophysical (GPR and gradiometer) and geomorphic methods to assess site and landscape dynamics including the potential preservation of certain cultural features.

Tripcevich, Nicholas [8] see Haas, Randy

Trousdale, William [230] see Allen, Mitchell

**Trujillo, Judith (Universidad de Los Andes; Researcher Gipri Colombia)****[8]**

*Archaeometric Studies of Rock Paintings in Colombia, South America: Geochemical and Mineralogical Characterization*

Geochemical studies of rock paintings in Colombia help to reflect on the technological processes used by the painting peoples to make these representations. With the use of analytical techniques, the chemical and molecular composition of pigments and of possible raw materials used in their manufacture are identified. Geochemical and mineralogical analyses are carried out with the help of analytical techniques such as X-ray fluorescence (in situ). In the laboratory, analyses are performed through techniques such as optical microscopy in transmitted and reflected polarized light, SEM/EDS electron microscopy, electron microprobe, X-ray diffraction, and Raman and Infrared spectrometry. The results show that the pigments of the rock

paintings have different compositions. Those of red colors present a high amount of iron oxides from clay minerals. The white ones come from minerals such as Anatase or Calcite. On the other hand, these geochemical studies offer relevant information to carry out conservation processes for rock art. The advances of these studies in the areas of the central highlands, in the Sabana de Bogotá and in the Orinoquia lands, in the Serrania de La Lindosa, are presented here.

Tschinkel, Khrystyne [160] see Verano, John

**Tsukamoto, Kenichiro (University of California, Riverside)**

**[93]**

*The Creation and Transformation of Regimes in the El Palmar Dynasty, Mexico, during the Classic Period (AD 250–900)*

Spatial and temporal heterogeneity of office titles and architectural styles in the Maya lowlands suggest that there existed diverse material, textual, and symbolic expressions that created, maintained, and modified regimes during the Classic period (ca. AD 250–900). The variation also signals that authority, power relations, legitimacy, and ideologies were not homogenous. Our research has yielded a variety of office titles, artifacts, and symbolic expressions in architecture at the archaeological site of El Palmar, Mexico. This paper examines how daily practices and interactions between royal families and officials constituted and transformed El Palmar regimes.

Tsukamoto, Kenichiro [147] see Sullivan, Kelsey

Tsukamoto, Kenichiro [183] see Wedemeyer, Rachael

Tuarez, Luis [249] see Wood, Richard

**Tuggle, Myra Jean, Timothy Rieth (International Archaeology LLC), Darby Filimoehala (International Archaeology LLC) and Matthew Bell (International Archaeology LLC)**

**[207]**

*I'a, Loko, and Loko I'a Kalo: The Riches of Pu'uloa Lagoon and How They Came to Be*

*I'a* (fish), *loko* (fishponds), and *loko i'a kalo* (taro fishponds) represent the traditional riches of Pu'uloa Lagoon, now called Pearl Harbor. With a single narrow entrance, the deeply indented and multi-lobed embayment cut 8 km deep into the central southern O'ahu coastline, creating a calm, self-contained estuarine environment, where constructed fishponds (*loko*) lined the inner shoreline of the lagoon, and farmed fields of Hawaiian staff of life taro (*kalo*) in the river deltas were used as fish nurseries (*loko i'a kalo*). The Pearl Harbor of today is a meager remnant of this traditional landscape. Only a few intact ponds, and even fewer agricultural fields, remain, impacted by development of the lagoon for civilian and military purposes. This paper focuses on one peninsula within the lagoon, using traditional, historical, and oral historical sources, combined with archaeological and paleoenvironmental studies, to examine the evolution of the Hawaiian use of this once rich and revered landscape.

Tulchin, Jon [43] see Duarte, Trever

Tumolo, Valentina [142] see Lawrence, Dan

Tung, Tiffany [29] see Bolster, Alyssa

**Turley, Samantha, Steven Wernke (Vanderbilt University) and Manuel Mamani****[189]***The Chaîne Opératoire Meets Colonial Transformations: A GIS Network Analysis of Quicklime Production in the Colca Valley, Peru*

In the sixteenth century the Spanish introduced new building technologies such as masonry arches, ceramic roof tiles, and quicklime-based products to Andean architectural traditions. The incorporation of these technologies changed the day-to-day experience of building construction, as local laborers created new routines in order to source, produce, and utilize these materials. However, the extent and nature of these changes is not well understood, as current studies of Peruvian colonial architecture and their role in colonizing processes have focused on the phenomenological impact of buildings as a whole or specific, stylistic aspects. Using preliminary data collected during the summer 2022, this study aims to elucidate the spatial relationships between different phases of quicklime production in the upper Colca Valley with a GIS spatial network analysis. Quicklime, a primary ingredient in mortar and whitewash, was often used in colonial structures like churches. Producing quicklime and its affiliated materials is labor intensive and location specific; it requires kilns, large amounts of fuel, convenient transportation, and proximity to both water and limestone. Spatially locating the *chaîne opératoire* of quicklime enables future comparisons to other material production sequences and thus helps scholars better understand how Spanish colonialism impacted local architectural traditions and daily life.

**Turner, Andrew D. (Getty Research Institute)****[11]***Molding a New Order: Ideological Transitions and Gulf Coast-Maya Lowland Interaction, AD 800–1000*

As numerous studies have noted, changes in themes, compositions, and content in Maya stone monuments from the ninth and tenth centuries present a departure from their Classic counterparts, which in turn appears to reflect changes in social structure and shifting patterns of regional and cross-regional interaction. At the same time, new ceramic types that seem to mirror the changes apparent in stone monuments circulated among Maya Lowland centers. To what extent did ceramic vessels serve as vehicles for imagery and symbolism adopted by Terminal Classic elites? Two types of mold-pressed vessels in particular share apparent formal and technological similarities: Río Blanco vessels from Veracruz and Pabellon Molded-Carved vessels from the eastern Maya Lowlands. This presentation considers the relationship between these two types and gauges the extent to which they reflect new patterns of cross-regional interaction and shifting ritual and ideological themes around the time of the Classic Maya collapse.

Turner, Andrew [238] see Coltman, Jeremy

Turner, Bethany [3] see Gagnon, Celeste

Turner, Simon [17] see Graham, Elizabeth

**Tuross, Noreen****[166]***Archaeological Science and COVID-19*

“Archaeological Science” is a big tent often thought to have a common entry portal and ease in traversing its major approaches. In reality, the tents are often quite separate due to the training and interests of the investigators, as well as the information content and utility of the data. What binds the exploration is an understanding by practitioners that the highest level of analytical competence coupled with a flexible, interdisciplinary interpretive structure is necessary for progress. In the last few decades, we have witnessed remarkable additions to the archaeological science toolkit. The overuse of some approaches, however, often

follows a beaten path. Utilizing the examples of light and heavy stable isotopes, I will illustrate the overuse phenomenon and highlight some of the paths forward. We have seen recently that “following the science” is an easy sound bite, but when faced with a complicated issue such as COVID-19, the scientific data production is slow, error-prone, incomplete, and often irritatingly confusing. The knowledge added by archaeological science approaches to the history of human life has been and will be many things: iterative, contradictory, mundane, transformative, and frustrating for the consumer. It is the nature of the scientific enterprise.

Tushingam, Shannon [8] see Zimmermann, Mario

Tuvshinjargal, Tumurbaatar [244] see Taylor, William

**Tveskov, Mark (Southern Oregon University)**

**[98]**

*Chair*

**Tveskov, Mark (Southern Oregon University) and Donald Ivy (Coquille Indian Tribe)**

**[98]**

*Two Millennia of Resilience: The Old Town Bandon Site on the Oregon Coast*

The Old Town Bandon site is a large archaeological site on the Oregon Coast that lies beneath the sidewalks of a settler community. The site has been the subject of over 30 years of archaeological research guided by the Coquille Indian Tribe. This work has revealed the remains of several plank houses and other domestic features, shell midden deposits, and an extensive array of artifacts and ecofacts. The site was also featured in an egregious massacre of Coquille people in 1854, and of communal celebrations by Coquille People through Termination and Restoration and to the present day. As such the site as a place is an important peak in the phenomenology of colonialism in the region.

Tveskov, Mark [74] see Gerard, Paul

Tvrdy, Zdenek [3] see Kvetina, Petr

**Tykot, Robert (University of South Florida)**

**[216]**

*Discussant*

**Tykot, Robert (University of South Florida), McKenna Douglass (Stone Point Services Inc.), Whitney Goodwin (University of Missouri, Columbia), Zachary Atlas (University of South Florida, Tampa) and Michael Glascock (University of Missouri Research Reactor)**

**[216]**

*Establishing Ceramic Source Groups in Florida Using a Multi-method Approach*

More than 500 ceramic artifacts from four prehistoric sites in Pinellas County, Florida, were analyzed nondestructively using a portable XRF spectrometer to address research questions about local production and potential movement or exchange over significant distances. All dating to the Safety Harbor period (ca. AD 900–1500), at least 100 diagnostic rim sherds from each of the four sites (Bayshore Homes, Maximo Point, Weeden Island, and Yat Kitischee) were analyzed for seven trace elements using a Bruker Tracer Vg, with results calibrated using known standards. The vast majority of the sherds tested have broadly similar compositions, indicating use of clay within this region, while there were a modest number of outliers suggesting some coming from further away. In addition, subsets of 10 sherds from each site were also analyzed by neutron activation analysis (INAA) at MURR and by ICP mass spectrometry (ICP-MS) at USF.

This multi-method approach was taken to test the performance of each and to determine the potential utility for sourcing/exchange studies of obtaining results for many more elements by using destructive methods. Furthermore, the ability to cross-calibrate data from these three methods allows direct comparison with results from other studies that have been conducted in Florida.

Tykot, Robert [125] see Whittington, Stephen

**Tzib, Frank (Aj Tz'ib)**

[181]

*Revitalizing Ancient Knowledge: A Community-Based Outreach Project Sharing Classic Maya Epigraphy in Ox Mul Kah (San Antonio), Belize*

This poster introduces a community engagement program I designed to teach Classic Maya epigraphy to members of my community, Ox Mul Kah (San Antonio, Belize). While the Classic Maya ancestors left us with an elaborate culture, which was passed on to modern communities like Ox Mul Kah, many Maya today are unaware of the ancestral achievements like hieroglyphic writing, and even fewer can read these texts. The goal of my project is to revitalize Maya connection to our ancestral past through teaching epigraphy. The project began with my love of my ancestral culture, this led me to learn epigraphy so I could teach my family and community. The project involved teaching introductory epigraphy to the point where people could create personalized phrases, and then paint these onto pottery or carve them onto slate. The poster also outlines the struggles encountered. At first, people did not seem interested, however these issues were overcome when they began to understand the writing of their ancestors. The project represents more than showing appreciation for traditional culture, it involves a community-based approach to spreading knowledge so people have a personal connection with their past.

**Ueki, Allyson**

[215]

*Landscape Systems of San Miguel de Carnué*

The historic settlement of San Miguel de Carnué is an eighteenth-century Spanish colonial frontier settlement in northern New Mexico, which served as a buffer settlement to protect Albuquerque from raids by surrounding nomadic tribes. The occupants, who were of mixed ancestry, constructed the settlement, and had lived there for less than a decade when a raid resulted in fatalities, abandonment, and forced destruction of their homes. Past archaeological research focused on the site has been sparse due to early confusion over the settlement's original location. My research has focused on understanding the influences of the natural, built, and cultural systems of landscapes on San Miguel de Carnué, especially regarding the intentions behind the decisions that the settlers may have faced during the creation and eventual destruction of the settlement. By looking at these three systems of landscapes, we are able to identify the relationships between them, and more specifically, how the creation of the settlement had been established according to the cultural system, with the natural system affecting how the built system was constructed.

**Ugalde, Paula (University of Arizona), Delphine Joly (University of York) and Calogero Santoro (Universidad Tarapacá, Arica, Chile)**

[114]

*Reconstructing a Paleoindigenous Communal Space: Living under the Trees in the Atacama Desert, Chile, 12,800–11,200 cal yrs BP*

Humans arrived in the Atacama Desert 13,000 years ago, facing one of the harshest landscapes on Earth. They settled in a rainless stretch of land with scattered patches of biotic resources fed by rainfall in the Andes. They established social networks with people from different environments, creating essential bonds to maintain viable populations. However, we do not understand how they inhabited this forbidding landscape to make it their home. We propose that, aside from water sources, groves of phreatophyte trees, especially *Prosopis*, were important when choosing locations for residential camps. These trees not only provided shade

and endured droughts, but fostered a more fertile environment by improving soils and attracting fauna. These groves would also have been visible landmarks in an otherwise barren landscape, promoting social aggregation. Based on ethnographic data, taxonomic identifications, and 100 radiocarbon dates on tree stumps, charcoal, and tools associated to Paleoindigenous sites, we propose that the first peoples of the Atacama did not always interact with trees through exploitative ways. We posit that Paleoindigenous peoples of the Atacama made efforts to preserve a specific genus of tree: *Prosopis*, preferring other species for firewood and tools, transforming *Prosopis* groves into focal points for inhabiting the Atacama.

Ugalde, Paula [61] see Santoro, Calogero

Uhnér, Claes [45] see Beck, Jess

Ukai, Nancy [160] see Farrell, Mary

Ullah, Issac [75] see Clow, Zachery

Umbelino, Cláudia [102] see Gonçalves, Célia

**Underhill, Anne (Yale University), Fengshi Luan (Shandong University) and Fen Wang (Shandong University)**

**[216]**

*Urbanization and Ceramic Consumption at the Late Neolithic Settlement of Liangchengzhen*

Excavations at the Longshan period settlement of Liangchengzhen in southeastern Shandong have uncovered large quantities and diverse forms of ceramic vessels from contexts representing each phase of occupation. This paper explores consumption patterns for ceramic vessels in one neighborhood during eight phases of occupation estimated to represent approximately 200 years. It compares consumption patterns for fine and coarse wares, discussing potential evidence for especially valued kinds of vessels recovered from different depositional contexts. Possible methods of ceramic distribution are discussed in relation to varieties of vessel form, surface treatment, and size over time.

**Unruh, David**

**[215]**

*Midden Deposits at a Salinas Province Pueblo: Archaeological Investigations at Chilili (LA 847)*

From March through April 2022, SRI excavated portions of LA 847, the archaeological site of Chilili. Positioned east of the Manzano Mountains on the border of the Plains and Pueblo spheres and representing the northernmost of the Salinas province pueblos, the prehispanic and colonial period occupation at Chilili dates from the late AD 1200s / early 1300s to the 1670s. SRI's excavations focused on a previously identified midden deposit in portions of the NM 337 NMDOT ROW that will be adversely affected by replacement of the highway bridge over Chilili Creek. Prior to excavation activities, SRI used GPR as a nondestructive means of identifying features not evident from surface documentation. SRI recovered tens of thousands of artifacts and ecofacts from the midden deposits, representing the first sizable collections available for analysis from a major pueblo settlement in the Manzano cluster of Salinas province pueblos in decades. This paper highlights SRI's findings during the recent excavations at Chilili and outlines how results of SRI's analyses of the site assemblage will address a variety of research topics, including chronology, local settlement history and dynamics, regional and interregional interactions, movement and mobilities, and diet and subsistence.

Urbina, Simón [12] see Adán, Leonor

**Uribe, Mauricio (University of Chile), Camila Riera-Soto (University of Cape Town), Javiera Gajardo and Mariela Torres [59]**

*Advances in Technological Studies of Northern Chile Ceramics: Petrography and Geochemistry of Fabrics and Paintings (Iluga Túmulos, Tarapacá)*

Over the last decades, ceramic research in the region of Tarapacá has nourished our comprehension on past societies. First, pottery has played a key-role in defining chrono-cultural periods of the south-central Andes. Second, archaeometric studies have allowed to discuss these social, cultural, political, and economic dynamics of prehispanic communities. Iluga (900 BC–AD 1600) is an archaeological area of great significance in northern Chile, with abandoned agricultural field crops and public monuments, partially buried by the Atacama Desert. Ceramics are the most abundant material with evidence from the Formative until Late Intermediate period, Late Horizon, and extend to Hispanic colonial times. Their styles imply different areas of origin, such as the western valleys, the Altiplano, and Circumpuna. We will present an update of our studies on the Iluga ceramic record, where the objective is to combine results obtained by ceramic petrography (thin sections and automated mineralogy) and geochemistry (major, minor, and trace elements and radiogenic isotopes). The application of these techniques has allowed the identification of possible sources for supply of raw materials, exchange networks, and circulation of vessels, pigments, and knowledge of different prehispanic populations of the central-south Andes who converged in Iluga Túmulos through time.

Uribe, Mauricio [12] see Adán, Leonor

Usami, Tomoyuki [141] see Begmatov, Alisher

Ushiro, Hiroshi [163] see Shichiza, Yuka

**Utting, Benjamin [137]**

*Bayesian Approaches for Attribute Analysis of Lithic Assemblages*

By studying stone tool technology, archaeologists and anthropologists shed light on big questions in human prehistory, including how ancient peoples adapted to changing environments, moved throughout landscapes, and interacted with other groups of people. There are many methodological approaches for characterizing stone tool technology, and several that involve the collection of metric data. However, the quantitative methods that archaeologists rely on to interpret these data remain relatively limited, and most often rely on frequentist null hypothesis significance testing. This paper presents a hierarchical Bayesian approach for parameter estimation in the analysis of lithic assemblages using a case study of several late Pleistocene assemblages from the Trảng An Landscape Complex, northern Vietnam. The results highlight several major advantages of the Bayesian hierarchical approach for lithic analysis, including (1) improved interpretability, (2) balance between overfitting and underfitting, and (3) explicit modeling of variation. The results of the attribute analysis indicate little technological variability over time at each site, but a high degree of variability between different sites. Due to the often hierarchically structured nature of archaeological data (e.g., contexts in trenches in squares), researchers studying similarly organized datasets should also consider the benefits of Bayesian hierarchical modeling.

Uy, Mirko [235] see Golitko, Mark

Uzzle, Stephen [25] see Towner, Ronald

**Vacca, Kirsten (University of Hawai'i, West O'ahu)**

[187]

*Moderator*

[187]

*Discussant*

**Vacca, Kirsten (University of Hawai'i, West O'ahu)**

[117]

*Collaborative and Equitable Training in Archaeology*

There has existed a lack of communication and collaboration between CRM and academic archaeology in the United States since cultural resource management moved out of university systems and into the private sector. This lack of collaboration proves problematic when future CRM and industry archaeologists are trained by academics through universities. Due to this lack of communication, it is a common refrain today to hear that new hires are missing vital skills necessary for entry-level positions. This paper will discuss common methods for training students in archaeological field methods through university programs, then discuss feedback from industry archaeologists regarding the gaps in methodological education of new hires coming straight from university systems. The paper will also discuss issues with equity, access, and inclusion concerning how we currently train archaeologists, and how to better form collaborative relationships between academics and the many industries where students find jobs after graduating from university. The feedback presented will survey archaeologists working in a variety of sectors who actively train students in field methods.

Vaiglova, Petra [25] see Sun, Yufeng

**Vail, Gabrielle (UNC, Chapel Hill)**

[180]

*Spindle Whorls and World Creation at Balankanche' Caverns, Yucatan*

This poster examines the implications of imagery identified as relating to Mesoamerican "Flower Worlds" on spindle whorls left in situ in Balankanche' Caverns by actors who used the caverns in the Terminal Classic period (ninth and tenth centuries) to invoke ritual-mythic time within this underworld space that was seen as the place of human creation and emergence. The spinning of fibers into thread is an act perceived by contemporary Maya people inhabiting the highlands of Guatemala and of Chiapas, Mexico as one linked to fertility—both human fertility and fertility in the form of vegetation and rain clouds. The spindle whorls include depictions of birds, solar symbolism, and flowers, suggestive of the fertile, flowery world where the male and female rain/water deities reside and the sun is reborn each day. Paired with censers depicting the Highland Mexican rain deity Tlaloc and miniature manos and metates for grinding, the space within the caverns can clearly be identified as a place where the (re)birth of the world and the human and nonhuman beings that inhabit it was enacted on a periodic (perhaps annual) basis.

**Val, Aurore (Universität Tübingen), Guillaume Porraz (Aix Marseille Université) and Marina Igreja (LARC DGPC, Ministry of Culture (Portugal) / ENVARC)**

[214]

*Using Ungulate Bones to Retouch and (Re)Sharpen Middle Stone Age End-Scrapers at Bushman Rock Shelter, South Africa*

Bone retouchers were first recognized in European Paleolithic assemblages at the turn of the nineteenth century. They have since been documented from sites across Eurasia, from Lower Paleolithic to Neolithic contexts. Notwithstanding their abundance in the archaeological record, the association between the

characteristics of the retouch on stone artifacts and the technological features of bone retouchers remain to be clarified. Besides, and surprisingly perhaps, bone retouchers are virtually unknown in Africa. A recent study describes the first significant sample of bone retouchers in Africa, from Tatoralt (Morocco), associated with Aterian lithic technology and dated to ca. 85,000 BP (Turner et al. 2020). Here we present a contemporaneous assemblage of bone retouchers from the southern end of the continent, discovered during excavations of the Middle Stone Age deposits at Bushman Rock Shelter, South Africa. We have recognized 23 specimens, strictly retrieved from layers associated with the production of lithic end-scrapers. The nature, morphology, and type of surface modifications observed on these retouchers highlight a standardized selection and use, possibly embedded in the broader *chaîne opératoire* of the end-scrapers. We discuss future experimental work on retouching end-scrapers with bone to investigate the modalities of production and use of these retouchers.

Valadez, Jocelyn [215] see Alexander, Rani

**Valdez, Fred (University of Texas, Austin)**

[17]

*Interdisciplinary Research in Maya Archaeology: Interests from the PfBAP*

The Programme for Belize Archaeological Project (PfBAP) has operated in NW Belize for more than three decades. While much of the research effort has been under what might be described as traditional archaeology, the research program today is significantly informed by geoarchaeology interests and lidar. Initial efforts were in settlement survey and site mapping; however, much of the last two decades focused on broader research interests including the role of ancient production and horticulture. Examples of significant research discovery are provided from select locations including large centers such as La Milpa, Dos Hombres Maax Na, and Gran Cacao, along with smaller centers and settlements including Say Kah, Warrie Camp, Medicinal Trail, Hun Tun, Chawak But'o'ob, and several long transects (Dos Hombres to Gran Cacao and at the SW region of the property). Lidar in particular is now changing our research approach and understanding of ancient Maya settlements and activities in NW Belize.

Valdez, Fred [228] see Adam, Manda

Valdez, Fred [154] see Pengilley, Alana

Valdez, Fred [73] see Schraub, Austin

**Valentin Irizarry, Paola (Centro de Estudios Avanzados de Puerto Rico y el Caribe)**

[234]

*Archaeology in Puerto Rico from 1960 to 1988: A Transition from Amateur to Regulated Archaeology*

In 1952, Puerto Rico began a new era of self-administration. The establishment of the Commonwealth of Puerto Rico inspired the creation of the Institute of Puerto Rican Culture (1955). The propaganda given to indigenous heritage resulted in the rise of amateur archaeologists. This paper considers the contributions of these groups toward the development of regulated archaeology. Different types of people discovered in amateur archaeology a way to study and connect with their Aboriginal heritage. At that time, the Institute had few staff to monitor these activities. Therefore, decided to create regional cultural centers to link the institution to remote regions. In the sixties, archaeological societies composed of students, professors, and amateurs interested in Puerto Rican prehistory emerged. These groups were dedicated to identifying archaeological sites and creating collections. They advocated for the implementation of ordinances for the protection of archaeological sites. The young people who participated in these groups formed the so-called generation of the seventies, known as the first group of locally trained archaeologists. These were the experts who advocated for local laws and regulations to protect archaeological resources. As a result, in 1988, the Law for the Protection of Terrestrial Archaeological Heritage of Puerto Rico was passed.

Valera, António [161] see Priola, Victoria

**Valerio-Romero, Karolina (University of Miami) and Traci Ardren (University of Miami)**  
**[191]**

*Reevaluating Precolumbian Pottery of the Florida Keys*

Recent excavations by the Matecumbe Chiefdom Project at two large midden sites in the Florida Keys have provided better contextual and chronological information on Keys ceramics than previously available. In combination with examination of ceramic materials from this collection, our paper will discuss the characteristics of precolumbian ceramic technology of the Keys and place it in regional context. We discuss vessel forms, design elements, and possible food choices. We also offer some preliminary thoughts on the complex interconnections between gender, work, and technology in the development and spread of pottery which resulted in crucial economic advances among South Florida's precolumbian peoples.

**Vallebueno-Estrada, Miguel (Gregor Mendel Institute [Austria])**

**[20]**

*Discussant*

**[20]**

*Chair*

**Vallebueno-Estrada, Miguel (Gregor Mendel Institute [Austria]), Krisztian Nemeth (Gregor Mendel Institute), Bruce Benz (Texas Wesleyan University), Michael Blake (University of British Columbia) and Kelly Swarts (Gregor Mendel Institute—Max Perutz Labs [Austria])**  
**[20]**

*Maize Adaptation to Changing Environments*

All organisms must contend with rapidly changing environments in the face of climate change in order to ensure the survival of the population (Hoffmann and Sgrò 2011). Domesticated plants, with a 10,000-year history of adapting to new environments, provide an excellent model for understanding genetic responses to changing climate as well as domestication genetics. Maize (*Zea mays* ssp. *mays*), a globally critical crop plant with extensive genomic resources, was domesticated from the tropical grass teosinte (*Zea mays* ssp. *parviglumis*). Although maize demographics during domestication and improvement were not straightforward (Beissinger et al. 2016; Hufford et al. 2013; Vallebueno-Estrada et al. 2016, 2022; Wang et al. 2017), populations fluctuated as people moved maize into increasingly novel environments, resulting in a wide variety of adaptations to different environments in a short period of time (Hufford et al. 2012b). Maize has a complex demographic history (Hufford et al., 2012a, 2013; Wang et al. 2017) and archaeological samples represent a unique opportunity to directly sample ancient diversity and to evaluate allelic combinations not present in extant samples in the context of changing environments.

Vallebueno-Estrada, Miguel [20] see Swarts, Kelly

**Vallejos, Joshua (Algonquin Consultants Inc.) and Katherine Peck (University of New Mexico)**  
**[99]**

*Evaluating Digital Workflows in Academic and CRM Settings*

Archaeological field research can be expensive for a student or a small cultural resource management (CRM) firm. This poster proposes inexpensive and efficient methods for students conducting field research and CRM companies with limited startup resources. We discuss the results of field testing our digital workflow, which utilizes Avenza Maps Pro, a Bluetooth GPS receiver (Bad Elf GNSS Surveyor), and a smartphone/tablet. This method was evaluated in a CRM setting in the US Southwest and during academic research on Hawai'i Island. Our results suggest several benefits of this digital workflow. Using these tools cuts down on field equipment, paperwork, and post-field digitization by creating forms and maps that require minimal postprocessing. Because of the digital nature of this process, accessibility is built-in. For example, field data can be entered

using voice-to-text and autocorrect. The few limitations of this workflow are also discussed, for instance, lower GPS resolution under a thick tree canopy. Nevertheless, for under \$1,000, this workflow is well within reach for student projects and small CRM firms.

**Vallerand, Amelie (Université de Montréal)**

[87]

*Paleolithic Occupations at Riparo Bombrini (Liguria, Italy): Understanding the Spatial Organization of Neanderthals and Homo sapiens*

The site of Riparo Bombrini (Liguria, Italy) offers a unique setting to compare the spatial organization of Neanderthal and *Homo sapiens* occupations in a single archaeological site. The disappearance of Neanderthals is one of the greatest debates in prehistory since the period of their decline corresponds to the arrival of *Homo sapiens* in Europe. It is often assumed that fundamental differences distinguish the two populations, and the ability to structure space within the sites they occupied into distinct activity areas is often invoked as a key distinctive trait of our species. However, this behavior has never been assessed for both groups at a single site, making direct comparisons impossible so far. This project aimed to objectively evaluate the degree of spatial organization in the earliest Protoaurignacian levels (A1–A2, associated with *Homo sapiens*) as well as the latest Mousterian levels (MS1–MS2, associated with Neanderthals) at Riparo Bombrini in order to establish whether these alleged fundamental differences between the two species do exist. Combining GIS and quantitative methods allowed the study of the spatial distribution of artifacts and features in these levels, showing that Neanderthals indeed organized their living spaces like *Homo sapiens*, suggesting “behavioral modernity” is not limited to our species.

**Van Alst, Emily (Indiana University)**

[221]

*Discussant*

**Van Alst, Emily (Indiana University)**

[241]

*Elk Hooves and Sharpening Grooves: Evaluating the Relationship between Three Rock Art Types on the Great Plains*  
Hoofprint markings are a widespread macro tradition across the Plains and Great Lakes region but their relationship to elk imagery has not been fully explored. Along those lines, limited research has been done on what is known of track grooves or rock art imagery attributed to Indigenous women sharpening their tools and leaving groove marks on rock panels. Additionally, elk images within a ceremonial context are sometimes found at these same rock art sites. Though these traditions are commonly seen on rock art panels together, how they may relate is not fully known. In order to explore their relationship, I will compare imagery patterns and use information regarding associated artifacts, landscape features, and geological attributes from state site forms to better contextualize the images. This interpretative framework will allow me to define the relationship between hoofprint tradition, track grooves, and ceremonial elk imagery and can illuminate information on the women who created and interacted with these types of panels.

**Vance, Emma (Bureau of Land Management)**

[182]

*Chair*

**Vance, Emma (Bureau of Land Management) and Danielle Waite (Bureau of Land Management)**

[182]

*A Silver Lining at the Failed Hardin City Mine: An Opportunity for Public Land Stewardship through Archaeology*  
Encouraging the public to invest in resource conservation, education, and exploration is an ongoing priority for the Nevada BLM, Black Rock Field Office. Black Rock Rendezvous (BRR), an annual event hosted on the Black

Rock Playa, is one such effort. The event introduces a wide variety of speakers, including BLM archaeologists, who have used it as an opportunity to engage in public outreach and education with an enthusiastic group of participants. In the past, this has included presentations about toolstone procurement, the California/Oregon Trail, and prehistoric Lake Lahontan. These talks have also led to opportunities to inform enthusiasts about the consequences of unauthorized artifact collection on public land. BLM archaeologists are planning to expand on the interest received at past BRRs by developing a cultural interpretation site. The ruins of Hardin City present an opportunity to share a story tying together multiple themes of postcontact Nevada history with a twist of deception and murder. It is the BLM's mission to introduce the public to local archaeology in hopes of fostering stewardship of cultural resources on public land.

Vance, Emma [182] see Waite, Danielle

Van Cleve, Andrew [81] see Poister, Nicholas

van den Dikkenberg, Lasse [116] see Van Gijn, Annelou

**Van Den Hurk, Yuri (Norwegian University of Science and Technology), Sean Desjardins (University of Groningen), Emily Ruiz Puerta (University of Groningen; University of Copenhagen), Anne Karin Hufthammer (University of Bergen) and James Barrett (Norwegian University of Science and Technology)**

**[63]**

*Diverging Harvesting Strategies of Atlantic Walrus: An Intercontinental Comparison*

In this paper, we compare historic Atlantic walrus commercial and subsistence exploitation in Svalbard (Norway) and Foxe Basin (Arctic Canada), respectively. Data are drawn from osteometric analysis of zooarchaeological surface remains at harvest locales (examined both in situ and in museum collections). In studying harvest strategies of the same species in fundamentally different socioeconomic contexts, we hope to better understand the diversity and sustainability of long-term Arctic human-animal relations. This ongoing work is carried out as part of "4-Oceans" (NTNU, Trinity College Dublin and NOVA U. of Lisbon; funded by the European Research Council), with data collected through "Timeless Arctic" (U. of Kiel; Volkswagen Foundation), the Osteometric and Biomolecular Analysis of Archaeological Marine Mammals Project (NTNU), the University of Bergen, the Scientific Expedition to Egedøya Svalbard (SEES), "SeaChanges" (both through University of Groningen and the University of Copenhagen) and "Limited Choices, Lasting Traditions" (both through University of Groningen; Dutch Research Council).

**Vandervort, Jason (New Mexico State University)**

**[215]**

*A Ceramic Analysis of San Miguel de Carnué Plaza Complex (LA 12924)*

This paper will present my analysis of ceramics recovered during the 2022 New Mexico State University Archaeological Field School at the land grant plaza settlement of San Miguel de Carnué (LA 12924), located in Tijeras Canyon. This analysis offers new insight into the lifestyles and trading patterns of the settlers who occupied this site between 1763 and 1771. Identification of different decorative styles and tempering materials, in some cases, allows us to determine where some ceramic vessels were first created and to reconstruct the routes they took to eventually arrive at Carnué. The identification of earlier pottery types within the collection also offers greater insights into the site's occupational history, and into the natural and cultural formation processes that have shaped the archaeological record.

VanDerwarker, Amber [213] see Ferree, Tyler

VanDerwarker, Amber [140] see Newhall, Victoria

VanDerwarker, Amber [218] see Noe, Sarah

Vang, Natasha [29] see Bolster, Alyssa

**Van Gijn, Annelou (Leiden University), Jeroen ter Brugge (Rijksmuseum Amsterdam), Diederik Pomstra (Leiden University), Annemieke Verbaas (Leiden University) and Lasse van den Dikkenberg (Leiden University)**

[116]

*Putting Life into a Stone Age Dwelling Construction: A Joint Venture of Local Volunteers and Archaeological Scientists*  
Public participation in archaeological projects is becoming ever more essential, and experimental archaeology is an excellent way of reaching out and creating a scientific community in which both the general public and archaeological scientists can learn from each other. At Masamuda near Rotterdam (Netherlands), local volunteers have established an open-air archaeological educational center focused on the Rhine/Meuse delta. In 2016 volunteers and professional archaeologists built a Neolithic dwelling here. In a new collaborative project, we attempt to fill in the details of daily life around this house: which crafts were carried out, how was food processed, and how did people move about this water-rich landscape? These questions are addressed through a combination of microwear and organic residue analysis, petrography, and experimental archaeology. Discussions and practical interaction with the volunteers, each with their knowledge and experience, have raised new questions not previously posed by archaeological scientists. These have opened up new research avenues and alternative interpretations to be explored through scientific analysis and further experiments. The scientific knowledge and practical expertise obtained by the volunteers are transferred to the center's visitors, ensuring a teaching-learning continuum outlasting the current research project.

Van Gilder, Cynthia [183] see Dixon-Hundredmark, Chris

**Van Keuren, Scott (University of Vermont) and William Graves (Statistical Research Inc.)**

[230]

*Ancient Ceremonial Landscapes in Northern Arizona*

Wendy Ashmore's concept of ceremonial landscapes highlights how sacred ideas and ritual practices are intertwined with "sacred geographies" and "spiritscapes." Her ideas have been primarily applied to prehispanic urban settings in the Americas, where cities and surrounding natural features are seen to manifest "cosmograms." We think her broader concept has potential for understanding cultural dynamics in non-urban, low-population settings as well. Here, we draw on her work to explore an emergent ceremonial landscape in the Flagstaff area before and after the Sunset Crater volcanic eruption (beginning ca. AD 1080). We specifically consider the form and use of ballcourts, which are the northernmost examples of quintessential Mesoamerican ceremonial structures. Along with plazas, unroofed great kivas, and platformed spaces, these features figure centrally in the performance of expansive public ritual in the shadow of the San Francisco Peaks. The geographic settings of ballcourts, and their configuration relative to associated structures, both hint at localized and unique engagements with a broader ceremonial landscape.

Van Keuren, Scott [45] see Haverland, Fiona

VanValkenburgh, Parker [55] see Zimmer-Dauphinee, James

Van Zandt, Tineke [181] see Prasciunas, Mary

Varien, Mark [90] see Ermigiotti, Paul

Varien, Mark [90] see Glowacki, Donna

Varien, Mark [90] see Potter, James

**Varillas, Rosa María (University of Illinois, Chicago)****[69]***Preliminary Survey of Puerto Inka*

Puerto Inka, also known as Quebrada de la Vaca, which lies on the Pacific shore in southern Peru, near the modern town of Chala, was connected to the Inka capital of Cuzco (over 800 km away) by the Royal Inca Road network, now known as the Qhapaq Ñan. Because of its preservation, its distinct administrative structures, its unique geographic position, and relative lack of previous excavations, Puerto Inka is perfectly suited for understanding coast–highland interaction via the movement of goods during Inka times. This poster summarizes the results from a pilot project conducted in August 2021 where remote-piloted uncrewed systems (a.k.a. drones) were used to survey the site and surrounding areas as well as to map and 3D model the main structures.

**Varma, Supriya (Jawaharlal Nehru University, New Delhi, India)****[217]***Migrant and Diaspora Communities in Ancient Kutch and Saurashtra*

Two categories of archaeological sites have been identified in the third and second millennia CE Saurashtra, viz. Indus and Local Chalcolithic, a distinction based on architecture, artifacts, nature, and the location of settlements. So far, the constructed narrative has been framed in binary terms, with the diaspora communities having migrated from Panjab and Sindh into Kutch and Saurashtra and establishing the Indus sites, while the local communities of Saurashtra were the residents of the Chalcolithic villages. A close reading of the architectural elements and artifacts more recently has allowed me to delineate instead a somewhat fuzzy and interdigitated world in ancient Saurashtra interlocking the migrant/ diaspora and the local communities. To an extent, I question the simplistic conflation often made by archaeologists between people and their material words into bounded entities and further seek to complicate the discussion by relooking at these two types of settlements. I argue that what seemingly appear to be two separate communities with their contrasting materiality may not quite have had such neat divisions between them in terms of autonomy, mobility, multiple social identities, exchange networks, and so forth.

Vasquez, J. Javi [209] see Sumner, Raymond

**Vasquez Pazmino, Josefina (Universidad San Francisco de Quito)****[16]***Mountaintops of Chilla, El Oro (Ecuador)*

The oral tradition of the Chilla landscape distinguishes two main stories: the first one portrays the apparition of the Virgin Mary, and the second one narrates the Mayan origins of its inhabitants. However, Chilla is in El Oro province, where a monumental pyramid and other neighboring sites correspond to the architectural footprints of ancient conquerors, such as the kañari, Inka, and Spanish, not the Maya. Today, the region of Chilla continues to effectively connect people from the Pacific coast with villages and towns of the southern Andes of Ecuador and Peru. Characterized by its location above the clouds, Chilla provided a strategic environment for building defensive features, shrines, and intermingled roads, which portray the meaningful legacy of the rise or fall of the Inka colonialism. This paper will analyze the political transformations of mountaintops taking into consideration seasonality, landslide hazard, mountain pass negotiation, and socioeconomic interests throughout time while focusing on the transitional Kañari-Inka period of prehispanic Ecuadorian history.

**Vaughan, Hunter****[229]***Chair*

**Vaughan, Hunter****[229]***The Environmental Costs and Benefits of Digitizing Archaeology*

Archaeological, heritage, and museum practice are increasingly inundated with the machineries and practices of digital technology, yet the costs and risks of these technologies remain outside disciplinary discourse. Lidar drones survey stratigraphic materials; tablet-based tours provide educational tools and immersive museum experiences; augmented reality apps help tourists time-travel; photogrammetry and 3D printing provide new opportunities for reproducing unique objects; and online databases assist in collaborative data sharing. These practices have clear benefits for the field: they can help to protect in situ materials, optimize public-facing science communication, and provide redundancy for material culture at risk. However, these technologies also bring a host of potential problems; in this talk I will draw from the burgeoning interdisciplinary subfield of environmental media studies to introduce important critical lenses for the archaeology's digital transition. In addition to life cycle issues of mining, manufacturing, and e-waste, I will address problems of energy dependency; dangers of obsolescence in digital preservation; and the larger philosophical and ethical challenges virtuality poses to the principles of materiality at the center of archaeology's larger mandate. Such groundwork will provide crucial framing for potential case studies regarding online archives, site practices, and AR/VR reception studies for museum institutions.

**Vázquez de Ágredos Pascual, María Luisa, Cristina Vidal-Lorenzo (Universitat de València), Patricia Horcajada Campos (Universidad Complutense de Madrid) and Núria Feliú Beltrán (Universitat de València)****[34]***Prehispanic Colors to Re-create New Images and Stories: Materiality and Technology of Color in the Colonial Houses of Chajul, Guatemala*

The houses of Chajul, region of Ixil, Guatemala, have preserved stucco coatings and mural paintings from the colonial period. Since 2019, the University of Valencia (Spain) has collaborated with the Jagiellonian University (Poland) within the framework of the Project of Conservation of Chajul Murals—COMUCH. The objective of this study has been to apply physicochemical analysis to the colors that have been preserved on the walls of these houses over time to identify their nature and origin. The results obtained to date indicate that the materials and color technology of these paintings is mainly prehispanic, as evidenced, for example, by the presence of Maya blue. This paper will present the multi-technical method that we have used in this study, which combines microscopic, spectroscopic, and chromatographic techniques, and the results obtained, which provide new evidence on the hybrid character that the mural paintings had in colonial times: coloring matter of prehispanic origin to create images and iconographic stories that were due to a new era and culture.

**Vazquez Fiorani, Agustina (University of Notre Dame), Ian Kuijt (University of Notre Dame) and Meredith Chesson (University of Notre Dame)****[162]***Assembling the Dead and the Living: Funerary Practices within Eastern Populations of the Southern Andes (Tucumán, Northwestern Argentina)*

Despite extensive archaeological research, surprisingly little is known about regional and interregional mortuary practices in the Southern Andes, specifically in Northwestern Argentina. Large-scale excavation carried out in El Cadillal, undertaken between 1971 and 1972, resulted in the recovery of 44 prehispanic burials associated with Candelaria dated from AD 500 to 1000. Mortuary practices included primary and secondary inhumations of adults and infants in urns, collective and single stone-cist burials, and direct inhumations of adults in pits. In this paper we explore how these data compare to results from other archaeological sites inside and outside of the yungas, the eastern rainy forests of the southern Andes. The limited comparative research on funerary practices in nearby regions, such as intermontane valleys and ravines, makes it difficult to understand the nature of regional and interregional burial practices. We argue that funerary practices associated with Candelaria were more varied and complex than usually assumed, and

suggest the possibility that mortuary traditions diffused to areas outside the yungas. We argue that previous studies on Candelaria's funerary practices often do not consider the material, social, and semiotic contexts of action of the dead, and the development, maintenance, and reproduction of villager practices.

**Vázquez López, Verónica (Tulane University), Felix Kupprat (Universidad Nacional Autónoma de México), Kathryn Reese-Taylor (University of Calgary) and Armando Anaya Hernández (Universidad Autónoma de Campeche)**

[93]

*Political Regimes at Calakmul*

The history of the Kanu'l dynasty and their Late Classic regime at Calakmul has been researched extensively since the 1990s. The most recent insights into the earlier episodes of Kanu'l politics have emphasized that their seat of power during the Early Classic was Dzibanche and that it was a powerful faction that took power in Calakmul in the early seventh century AD. The Kanu'l may have been in close contact with local political entities for quite some time before their formal establishment at Calakmul, steadily building an exhaustive network of allies in the central Petén. Settlement data from Calakmul's center favors a model of multiple powerful social units cohabiting in the site during the Kanu'l's heyday. Several large residential compounds with palace-like features surround the city's principal administrative and religious precinct and may indicate a multi-factional political system during the Late Classic. Some of those factions may have been related to groups mentioned in pre-Kanu'l texts at Calakmul and other sites in the region, or Late Classic foreign allies who sent representatives to live close to the Kanu'l court.

**Vega-Villalobos, Maria Elena (UNAM), Ana García Barrios (Universidad Rey Juan Carlos) and Alejandra Martínez de Velasco**

[52]

*Las mujeres en los rituales de final de periodo durante el Clásico maya (250–900 dC)*

Durante el periodo Clásico se esculpieron dinteles y estelas donde algunas mujeres de sitios específicos desempeñaron un papel relevante en las ceremonias de final de periodo. Así lo atestiguan inscripciones de varias ciudades del Usumacinta y de la región de Petén, entorno geográfico en el que se centrará nuestro trabajo. La escritura jeroglífica, junto con las imágenes que presentan los monumentos, serán las fuentes principales de este estudio, el cual busca analizar el papel político, ritual y social que las mujeres desempeñaron en las importantes ceremonias de final de periodo, indagando en tópicos relacionados con los lugares, momentos y circunstancias en que éstos se llevaron a cabo, así como con el tipo de conmemoración a las que estuvieron vinculadas. Intentaremos, además, aproximarnos al protocolo que marcan estos rituales a través de la indumentaria y parafernalia que portaron las mujeres protagonistas.

Velásquez, Juan Luis [34] see Zych, Boleslaw

**Velázquez-Maldonado, Luis (Colegio de Michoacán), Berenice Pedroza (Escuela Nacional de Antropología e Historia), David Larreina-García (UPV-EHU: University of the Basque Country), Mario Retiz-García (Colegio de Michoacán) and Blanca Maldonado (Colegio de Michoacán)**

[13]

*Acumulación de metales y procesos tecnológicos vinculados a las escorias presentes en el sitio arqueológico de Jicalán Viejo*

El sitio arqueológico de Jicalán Viejo (posclásico tardío—colonial temprano) presenta una elevada concentración en superficie de escorias de metalurgia, relacionadas con los procesos de beneficio del cobre. El análisis químico por Espectrometría de Fluorescencia de Rayos X de 150 muestras de escorias, evidenció que varias tendencias de acumulación de elementos químicos pueden ser identificadas, así como que ciertos patrones acumulativos pueden ser asociados a tipologías específicas, siendo dicha relación sistemática en el

ámbito de la población muestral actual. En este sentido, consideramos que Los resultados preliminares antes mencionados, pueden asociarse a los procesos tecnológicos característicos de las diferentes etapas del beneficio del cobre, así como a la diversidad de fuentes de materias primas. Estos resultados, se encuentran en correspondencia con los análisis de XRF de escorias de Itziparátzico, presentados en Maldonado y Rehren, *Journal of Archaeological Science* 36, 2009. El presente trabajo se propone, establecer un análisis crítico sobre ambos aspectos del estudio material, con base en las características químico morfológicas (microscopía estereoscópica) de las escorias, así como en la información contextual correspondiente.

Velázquez-Maldonado, Luis [125] see Maldonado, Blanca  
 Velázquez-Maldonado, Luis [13] see May-Crespo, Jose  
 Velázquez-Maldonado, Luis [13] see Pedroza, Berenice  
 Velázquez-Maldonado, Luis [13] see Sanchez Guerrero, Andres Francisco

Velazquez Morlet, Adriana [204] see Reese-Taylor, Kathryn

**Véliz Corado, Fernando (University of Texas, Austin)**  
**[236]**

*The Best Offense Is a Good Defense: Monumental Defensive Works at La Cuernavilla*

The ancient Maya center La Cuernavilla is well known for its defensive features and its role as a fortress located between the Classic Maya cities of Tikal and El Zotz in the Buenavista Valley of modern-day Guatemala. Excavations of the defensive features as well as the analysis of the artifacts collected during excavations help elucidate the function of these walls and platforms. A series of defensive systems were constructed to protect the inhabitants of La Cuernavilla of any possible incursion and/or siege made by groups, especially those coming from the west and north. The excavations revealed coarse architecture, modifications in the bedrock, and material culture including broken vessels, lithic weapons, and charcoal samples. These data indicate a continuous occupation of La Cuernavilla throughout the Early Classic (250–600 CE) and eventual abandonment in the Late Classic by 800 CE. It seems that the ancient Maya rapidly built this fortress during a period of political tensions and conflicts in the Buenavista Valley. This research contributes to the study of warfare and violence theory, providing a wider perspective of ancient human relationships and behaviors and insights to how contemporary conflicts occur.

Velliky, Elizabeth [2] see MacDonald, Brandi

**Vendome-Gardner, Charlotte (University of Exeter) and Stephanie Pratt (Art Historian and Curator)**  
**[241]**

*Landscape-Based Approaches and Cross-Cultural Exchange: Working toward an Inclusive Model of Study in Fluteplayer Rock Art Research*

The Fluteplayer is a widely recognized figure within American Southwest rock art but has been subjected to a predominantly symbolic method of study rooted in the mis-association with the Kachina Kokopelli and shamanistic ideas of fertility. This has led to the Fluteplayer being misinterpreted, appropriated, and widely commodified as Kokopelli, and Fluteplayer imagery is now entangled with modern, predominantly Western, interpretations of this character, detracting from the figures cultural value and presenting the notion of a static culture. This discussion will present current PhD research that focuses on how the Fluteplayer can be studied to move beyond the stereotypes pertained by the Kokopelli association using a landscape-based approach to establish a context, in Chaco Canyon, and the wider sociocultural placement of the image in Chacoan society. Fundamentally, it will seek to explore the diversity and individuality of Fluteplayer sites and form a cohesive understanding with a cross-cultural dialogue and the open and respectful sharing of this knowledge with Indigenous people. This inclusive landscape-based approach aims to go beyond more

conventional methodologies and work toward a new cohesive understanding in order to gain a greater knowledge of the Fluteplayer.

Venter, Marcie [216] see Meyer, Matthew

Ventresca Miller, Alicia [76] see Luurtsema, Anna

**Verano, John (Tulane University), Khrystyne Tschinkel (Tulane University), Helen Chavarria (Universidad Nacional de Trujillo) and Gabriel Prieto (University of Florida)**

**[160]**

*Warfare and Captive Sacrifice in the Moche World: New Data from Excavations at Pampa la Cruz, Moche Valley, Northern Coastal Peru*

Depictions of combat and the capture and killing of captives are well known in Moche (ca. AD 200–850) art. Since 1995, the iconographic record has been joined by archaeological evidence of the practices themselves. The most dramatic discoveries were made in Plazas 3A and 3C at the Pyramid of the Moon between 1995 and 2001, with scattered deposits discovered at the Uhle Platform and the New Temple (Platform III). More recently, captive killing has been found at the site of Pampa la Cruz, about 13 km northwest of the Pyramids of Moche. Discoveries include both partial and complete skeletons and a mass burial of disarticulated remains of at least 50 individuals. Skeletal trauma (perimortem fractures and cut marks) and the remains of ropes around the necks, wrists, and ankles of some victims indicate that they were physically restrained before meeting a violent death. Patterns of trauma seen in the Pampa la Cruz victims are quite distinct from that seen at the Pyramids of Moche, while similarity is found in complex post-mortem treatment of bodies. Local traditions and periods of increased political and territorial conflict may explain the distinctive forms of violence documented at these sites.

Verano, John [134] see Schaefer, Benjamin

Verano, John [134] see Torres Morales, Genesis

Verano, John [134] see Witt, Rachel

Verbaas, Annemieke [116] see Van Gijn, Annelou

Verde, Maria [126] see Czujko, Stephen

Verheijen, Ivo [166] see Mentzer, Susan

**Vernon, Kenneth (Center for Collaborative Synthesis in Archaeology)**

**[97]**

*Chair*

**Vernon, Kenneth (Center for Collaborative Synthesis in Archaeology), Weston McCool (University of Utah), Simon Brewer (University of Utah), Brian Coddling (University of Utah) and Scott Ortman (University of Colorado, Boulder)**

**[97]**

*The Ecology of Agglomeration and the Rise of Chaco Great Houses*

Decisions individuals make about where to live have profound consequences for everything from climate and conflict, to migration, inequality, the origins of agriculture, and urban development. It is not surprising that

understanding and explaining those decisions remains an open and active area of research within archaeology. Many of the important innovations coming out of that research are owing to the application of an optimality model from Behavioral Ecology known as the Ideal Free Distribution. Crucial to this model is the notion of negative density-dependence, or the idea that the quality of a habitat declines as a function of increasing population size, which is assumed to lead to increasing competition for limited resources. However, the model has in recent years also become a tool for investigating possible positive density-dependent effects, otherwise known as Allee or agglomeration effects. Here, we seek to explore such effects by applying the model to the distribution of Chaco great houses and neighboring residential sites in the North American Southwest, using data and analytical tools provided by the cyberSW project. One potential challenge we hope to address with this analysis is the difficulty of disentangling environmental from socioeconomic agglomerations.

Vernon, Kenneth [97] see McCool, Weston

Vernon, Kenneth [27] see Moffatt, Maren

Vetrisano, Lucas [171] see Franco, Nora

Vetter, Lael [118] see Motta, Laura

Vicencio, Gabriel [26] see Carballo, David

Victorina, Amy [234] see Giovas, Christina

**Vidal-Elgueta, Alejandra (Pontificia Universidad Católica de Chile) and Francisca Santana-Sagredo (Pontificia Universidad Católica de Chile)**  
[235]

*From Cattails to Maize: An Archaeobotanical Discussion on the Relationship between Human Groups and Plants during the Archaic and Formative Period (ca. 4000–2000 BP) in the Atacama Desert*

In the Atacama Desert, northern Chile, human groups settled during the Archaic and Formative periods (ca. 4000–2000 BP) in the Tiliviche and Aragon sites, located between the coast and the hinterlands. We analyzed and identified the macrobotanical and microbotanical remains from the sites of Tiliviche-I and Aragón-I to evaluate the ontologies among the Tarapacá prehispanic groups by looking into their relationship with nonhumans (plants, animals, and nonliving beings such as mountains, etc.). The results indicate extensive use of wild taxa during the Late Archaic period (ca. 4000 BP), including cattails, reeds, algae plants, and others. However, during the transition to the Formative period (ca. 2500 BP), we identified a dramatic shift in plant use to cotton, maize, gourds, and algarrobo, while the “archaic plants” almost disappear from the Formative record. We discuss this dramatic shift according to the potential use of each taxon. Since the environmental conditions remained the same during those times, we explore the possibility that this replacement occurred due to new ontological views. Thus, we suggest a profound change in the relationship between human groups and plants.

**Vidal Guzmán, Cuauhtémoc (George Washington University)**  
[91]

*Persistence in the Nochixtlán Valley during the Classic to Postclassic Transition: Preliminary Notes from Etlatongo*

As in many other parts of Mesoamerica, the transition from the Classic to Postclassic periods in the Nochixtlán valley is a debated topic given the paucity of research in the Ñuu Savi area. Recently, archaeologists have aimed to elucidate the social transformations that took place during this liminal time by conducting excavations at various sites in the valley. In this paper, I describe preliminary observations from the Proyecto Arqueológico Yucunduchi, a project that studies enduring histories at the site of Etlatongo. Situated at the center of the Nochixtlán valley, Etlatongo provides a felicitous opportunity to study the persistence of social practices given its long continuous occupation. I describe how the remains of two recently excavated households with complex construction sequences highlight how the ancient people of

Etlatongo reinterpreted and transformed social practices even as they perpetuated them. By focusing on the polity of Etlatongo, I highlight how sites barely mentioned in the codices have the potential to yield significant insights with broader ramifications for the study of Mixtec history.

Vidal Guzmán, Cuauhtémoc [242] see Blomster, Jeffrey

**Vidal-Lorenzo, Cristina (Universitat de València) and Gaspar Muñoz Cosme (Universitat Politècnica de Valencia)**

[11]

*Cultural Transmission between the Southeastern Petén and Puuc Regions: The Frieze from La Blanca and the Origin of the Mosaic Technique*

In the Late Preclassic, certain buildings in the Petén region began to incorporate complex iconographic programs on their façades. The friezes with central masks, carved in limestone and covered with layers of stucco, are particularly striking examples of this development. Centuries later, in the northern Maya Lowlands, architectural styles appear that were characterized by the use of the mosaic technique in sculptural relief, which reached their greatest splendor during the Terminal Classic in the Puuc region. The discovery of a frieze in a substructure of the Acropolis of La Blanca in 2013 represented a major breakthrough in the understanding of Petén architecture. The frieze was made up of small pieces that are fitted together. These pieces show advances or recesses and even premeditated turns, possibly to enhance the artistic effect. These compositions represent a notable technical advance in the architecture of southeastern Petén and may constitute a precedent for the achievements of the mosaic that would later flourish in the Northern Yucatán. The aim of this paper is to identify and explore the possible pathways of cultural transmission between the two regions, and to see how these contacts may have influenced the major architectural styles that flourished after AD 800.

Vidal-Lorenzo, Cristina [34] see Vázquez de Ágredos Pascual, María Luisa

**Viestad, Vibeke (University of Oslo; RARI, Wits University)**

[226]

*Body Modifications among San Hunter-Gatherers: A Relational Practice and Subsistence Strategy*

Body modifications are a well-known aspect of various cultural practices among the historically and ethnographically known San hunter-gatherers of Southern Africa, but not until recently have such practices been analyzed within an interpretative framework that gives reason to suggest that they were mostly performed to ensure harmonious relationships—between humans and other-than-human sentient beings and identities—essential to uphold life and thrive in their world as foragers. This presentation provides an overview of the most relevant published literature, as well as two main corpuses of primary source material, discussing body modifications in San communities of the recent past. The purpose is to systematize the existing documentation and synthesize what appear to have been the practices of consequence. This will be done to outline and further develop the notion of body modifications in San hunter-gatherer contexts as a relational practice, suggesting a close cultural discourse between the alteration of the body and other material cultural practices—such as incised, burnt, and painted patterns in skin- and woodwork, as well as the art of rock engravings.

**Vilchez Carrasco, Carolina**

[164]

*Jerry Moore: Aportes a la arqueología en el extremo noroeste peruano*

Jerry Moore, desde el año 1996, ha realizado grandes contribuciones a la prehistoria de Tumbes, lugar con escasa investigación, ubicado en el extremo norte de la costa del Perú, frontera con Ecuador. Entre los años 2003 y 2007, excavó los sitios arqueológicos de El Porvenir (4750-1200 aC), Uña de Gato (2200-800 aC), Loma Saavedra (1100-1520 dC) en el valle de Zarumilla y Santa Rosa (3500-2900 aC) en el valle de Tumbes; proporcionando fechados radiocarbónicos que han permitido reconstruir la secuencia cronológica desde las

transiciones del Formativo hasta la ocupación Inca y aportando valiosos datos sobre la explotación de recursos, patrones de arquitectura doméstica y monumental, ritos y prácticas ceremoniales, desconocidos hasta ese momento. El año 2011, excavó el Taller de Spondylus de Cabeza de Vaca (1450-1650 dC) destinado a la producción especializada y en gran escala de bellas y diminutas figuritas, colgantes y cuentas confeccionadas con este preciado molusco, mostrando claras diferencias con los talleres malacológicos del sur ecuatoriano y norte peruano, siendo a la fecha, único en su tipo. Sus aportes dan nuevas luces sobre la complejidad cultural de sociedades emergentes y tardías en el extremo norte peruano y sus relaciones con otras sociedades del área andina.

**Villagran, Ximena (University of Sao Paulo), Marcony Alves (University of Sao Paulo), Thiago Kater (University of Sao Paulo), Kelly Brandão (University of Sao Paulo) and Francisco Pugliese (University of Sao Paulo)**

[86]

*Organic Inclusions in Amazonian Ceramics: A Petrographic Approach*

Organic inclusions, such as freshwater spicules (*cauixi*) and tree bark ash (*caraipe*) are one of the most diagnostic elements of pottery production in the Amazon basin. At the Monte Castelo shell mound (southwestern Amazonia), Bacabal pottery represents the widespread use of sponge spicules in the ceramic paste, from ca. 4000 BP. Bacabal pottery is one of the oldest in Amazonia and petrographic analyses revealed a pottery recipe kept for nearly 3,000 years that involved a relatively unchanged proportion of clay and sponge spicules in the paste. Petrographic data, combined with regional sampling of clay sources, expanded the discussion of intentional addition of spicules to the ceramic paste and/or selection of naturally sponge-rich clay sources. The promising results allowed new lines of work, extending the petrographic studies done at Monte Castelo to other sites in the Southwest, Central, and Lower Amazon. Here we will present the results of the petrographic study of Bacabal pottery and new research focusing on the development and use of organic material in Amazonian ceramics, its technological advantages, and geographical and cultural expansion.

Villanea, Fernando [118] see Buckser, Sasha

**Villasenor Iribe, Eunice (Arizona State University)**

[123]

*Defending Hilltops: Terraced Landscape Creation during Periods of Prehispanic Warfare*

Terraced landscapes are the geomorphic remains of dynamic cultural processes. Terraces were constructed in a range of environmental conditions to serve a variety of ecological and social functions. In Mesoamerica, terrace use spans thousands of years and is often associated with agricultural production. This study investigates the utilization of terraced landscapes during periods of increased regional violence and political instability. I analyzed various environmental characteristics and material assemblages associated with terraced hill sites in Northwestern Mexico to achieve this. Previous analysis of these sites has resulted in their classification as primarily defensive or ritual in purpose. Using a network approach, I attempt to understand how interactions between the social and ecological landscape shaped the land use decisions that determined the specialized functions of these terraced hillslopes. A comparison with terraced sites in Central Mexico was conducted to determine how variations in ecological and social landscapes impact the physical characteristics and material assemblages associated with terraced hilltop sites.

**Vining, Benjamin (University of Arkansas, Fayetteville), Daniel Cont (University of Florida) and Augusto Bazan (Proyecto Arqueologico el Brujo)**

[63]

*Beyond Coarse Correlations: Climate, Chronology, and Culture in Chicama, Peru*

Recent interest in applying archaeological datasets to climate change analyses has identified issues of data interoperability and challenges aligning cultural and climatic chronologies. Archaeology on Peru's north coast has significant potential to address paleoclimate and future climate change adaptation. Despite this potential, reliance on imprecisely dated cultural phases limits our ability to correlate climatic and cultural events. In

part, this is a methodological issue: conventional excavation and survey approaches are not typically designed to broadly sample contexts for chronological purposes. We present an approach for improving absolute cultural chronologies, developed for contexts in Peru's Chicama Valley. We capitalize on the unfortunate damage to archaeological sites by illicit looting and development to rapidly document, sample, and radiometrically date exposed contexts with minimal archaeological intervention. We use drone photogrammetry, RTK GNSS mapping, conventional inventories of ceramics, adobe brick and profile documentation techniques, sample flotation, and Bayesian  $^{14}\text{C}$  analysis to establish a high-precision absolute chronology for these exposures and associated artifacts. With this approach, we can strategically gap-fill existing chronologies and improve the precision of cultural chronologies with minimal disturbance to extant archaeological contexts. This strategy further allows us to better align absolute cultural and climatic chronologies to address issues beyond correlation.

**Vivero Miranda, Jose**

[75]

*The Spanish Conquest in the Petatlan, Sinaloa: Cultural Change and Social Reorganization*

Historically, archaeological research in northern Sinaloa, Mexico, focused on the coastal plains, with minimal attempts to comprehend the adjacent archaeological groups scattered in the hinterlands of the Sierra Madre along major water systems. These regions are most often interpreted through the lens of ethnohistorical accounts that provide a window on the complex social organization of the local Indigenous population during the decades that followed colonial contact. Researchers still struggle to comprehend how the colonial intrusion impacted preexisting Indigenous social organization. This poster sheds light on changes that occurred in the sixteenth and seventeenth centuries in the Indigenous groups' organization through the use of GIS tools applied to new archaeological data from the Petatlan province. The results indicate there is evidence to infer the establishment of at least one Indigenous monitoring site to surveillance specific missionization areas. Also, settlement pattern data provide tentative insights regarding how missionization efforts impacted Indigenous subsistence economies.

Viviano, Carlos [249] see Kanazaki, Yuko

**Vizcarra, Hannah, Amanda Zetz (Cal Poly Humboldt), Marisol Cortes-Rincon (Cal Poly Humboldt), Raylene Borrego (Cal Poly Humboldt) and Kristen Harrison (Cal Poly Humboldt)**  
[55]

*3D Visualization of Cultural and Archaeological Features in the Dos Hombres to Gran Cacao Archaeology Project*

The development of digital technologies and the use of advanced photogrammetry programs for modeling archaeological excavations and sites have opened new possibilities for spatial analysis in archaeology and the reconstruction of archaeological contexts. Among its main objectives, the Dos Hombres to Gran Cacao Archaeology Project investigates the sociopolitical nature of the study area through architectural, material cultural remains, and geospatial analyses. The scope of this research is to present the basis of a digital database that incorporates 3D photogrammetry and technical illustrations of cultural features located in an ancient Maya ceremonial site located in northwestern Belize. These techniques allow the digital preservation of information through time, giving the opportunity to multiple experts to revisit the information over the long-term.

Vizcarra, Hannah [227] see Angeloff, Nick

Vizcarra, Hannah [77] see Borrego, Raylene

Vizcarra, Hannah [17] see Cortes-Rincon, Marisol

Vizcarra, Hannah [95] see Zetz, Amanda

**Voggeser, Shannon (Colorado State University/CEMML) and Gwynn Ellis (Colorado State University/CEMML)****[209]***Development and Use of Interactive Cultural Resources Tribal Relations Viewer for Informed Air Force Decision-Making*

The Center for Environmental Management of Military Lands (CEMML) collaborated with the United States Air Force Civil Engineer Center (AFCEC) to develop an interactive Cultural Resources Tribal Relations Viewer. This application uses WebApp Builder for ArcGIS and enables exploration of critical historic and current-day tribal lands GIS data layers as they relate to DoD installations in the United States. The Air Force Geospatial Information Management System (AFGIMS) Map Services have been pulled into the Tribal Relations Viewer so that tribal lands data can be viewed alongside AFGIMS GIS data layers including airfield, utilities, and infrastructure data. The viewer provides data and analysis to inform decision-making regarding tribal consultations, thus enhancing understanding of tribal input on Air Force activities. We will discuss the collection of authoritative data and historical maps and the processes involved in preparing the data for use in the interactive map. We will then demonstrate the user interface of the application, including tools like a proximity search, bookmarks, and print function. Further tools developed specifically for the viewer allow additional functionality, such as a point of contact list for hundreds of tribes. Additionally, we will discuss the way forward for future development of this tool.

**Voss, Barbara (Stanford University)****[188]***Discussant*

Voyakin, Dmitry [102] see Hansen, David

Wade, Angela [96] see Krasinski, Kathryn

Wagner, Mark [162] see Best, Kaleigh

Wagner, Mark [82] see Spencer, Jessi

**Wai, Christopher (University of Toronto)****[105]***The Museumification of Video Game Artifact Collecting: The Development of Experiences in Archaeological Video Games from Trophy Taking to Decolonizing and Educating*

Collecting objects forms a core game mechanic. Traditionally, critiques have focused on the trivialization of cultural objects. However, I argue that such collections have grown in their educational and informative ability for players. Furthermore, such games are reflexive, informing the public, drawing in potential archaeologists, and being informed by the archaeological community. While dismissing games for their lack of reality has long been common, there is now a generation of archaeologists that grew up with them. In fact, the discipline has made them reach a much more faithful degree of accuracy and dedicated intent with how they describe and characterize objects and their descriptions from more archaeology-themed, fantasy, and sci-fi games from trophy taking to education. Where once they were only collectibles, now some innovate upon them with full descriptive text, voice-over narration, and photogrammetric models. In some ways, creators have responded to the inherently problematic process of simple trophy taking. These new functionalities demonstrate the new possibilities inherent in keeping such mechanics. Instead, plot and context affect the problematic elements one may find in its use more than the mechanics themselves. These games also give archaeologists things to ponder on digital assets in the museum or collections management context.

Wai, Christopher [55] see Wai, Stefanie

**Wai, Stefanie (McMaster University) and Christopher Wai (University of Toronto)****[55]***Defensive or Ritual Networks? A Preliminary Geospatial Analysis of Cerro Prieto Espinal in the Jequetepeque Valley, Peru*

Mountainsides formed powerful spaces for ritual, defense, and settlement, and Andean communities often considered them the very embodiments of their animate ancestors or wak'as. However, they remain understudied within the North Coast region despite their proliferation during the Late Moche and Late Intermediate periods. This paper presents a preliminary geospatial analysis (e.g., viewshed) of several major mountains and sites in the Cañoncillo Complex (Huaca Colorada, Tecapa, Jatanca, and Huaca Dos Cruces), located in the southern Jequetepeque Valley of Peru, to understand its possible social, political, and religious relationships. This analysis focuses on Cerro Prieto Espinal (~500 BCE-1470 CE), the primary fortified site at Cañoncillo. We argue that this site played a major strategic and communal role in this complex's developments and its interactions with the broader landscape of defended mountainsides (e.g., Talambo, Cerro Chepen, and the Cajamarca Highlands). Our analysis combines data from Google Earth, military aerial photography, drone imagery, and RTK GNSS point sources gathered from our recent 2022 survey and excavation season. Finally, given the powerful nexus of strategic and ritually charged functions and meanings associated with such mountainsides, we look to problematize the interpretive use of GIS in past reconstructions.

**Waite, Danielle (Nevada Bureau of Land Management)****[182]***Chair***Waite, Danielle (Nevada Bureau of Land Management) and Emma Vance (Nevada Bureau of Land Management)****[182]***Cleaning Up a Stinky Ghost Town: Developing the Townsite of Sulphur, Nevada, into a Cultural Interpretive Site*

The Sulphur Townsite is a 400-acre, NRHP-eligible historic archaeological site in northwest Nevada. The site is managed by the Bureau of Land Management, Black Rock Field Office within the Winnemucca District. Although originally developed into a cultural interpretive site in 2016, an interdisciplinary team has begun working toward enhancing and further developing the site with the eventual goal of it becoming the Gateway to the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area. While all that remains of Sulphur are the ruins of a small twentieth-century mining community, the site endures as a symbol of Nevada cultural heritage and is significant to the local history. Sulphur is representative of a pattern of regional development associated with mining and the Western Pacific Railway. Through coordination with archaeologists, recreation planners, local museums, and stakeholders, the Bureau of Land Management is in the early stages of developing Sulphur into a formal cultural interpretive site. This poster illustrates the efforts made by archaeologists and interdisciplinary specialists to enhance and further develop a cultural heritage site and foster greater public engagement with cultural and heritage resources on the Winnemucca District.

Waite, Danielle [100] see Clark, Jessica

Waite, Danielle [182] see Vance, Emma

**Waite, McKenna (University of Georgia) and Suzanne Pilaar Birch (University of Georgia)****[70]***Stable Isotope Signatures in Modern Elk Teeth and Their Relevance for Paleoclimate Reconstruction*

Isotope signatures of oxygen ( $\delta^{18}\text{O}$ ) and carbon ( $\delta^{13}\text{C}$ ) from herbivore tooth enamel carbonate have been established as useful paleoenvironmental proxies in a number of archaeological contexts. Elk remains are abundant in the European and North American archaeological records, therefore making them a valuable taxon for study. We selected 13 individuals of *Cervus elaphus canadensis* from the Great Smoky Mountains National Park collected over a period of 10 years for isotopic analysis. These individuals were part of a herd that was introduced to the park in the early 2000s and is geographically constrained to the Cataloochee

Valley of North Carolina. Our study evaluates the potential of tooth enamel carbonate from modern elk second and third molars as climate indicators (precipitation and temperature) with relevance for archaeological and paleoenvironmental interpretation.

**Wake, Thomas (Cotsen Institute of Archaeology at UCLA)**

**[203]**

*Prehistoric Fishing Practices in Bocas del Toro, Panama*

The pre-European population of the Bocas Del Toro Archipelago was more numerous and diverse than previously thought. Fish were a primary source of vertebrate protein throughout the region. Recent findings illustrate that the inhabitants of Sitio Drago consumed both maize and beans, not just root and tree crops as previously assumed. This presentation highlights the contribution of fish to diverse diet at Sitio Drago and examines fishing-related material culture, resource focus, collection strategies, and fish consumption at the site.

Walbrecker, Jenevieve [248] see Boyer, Cassandra

**Walden, John (Harvard University), Olivia Ellis (University of Pittsburgh), Claire Ebert (University of Pittsburgh), Julie Hoggarth (Baylor University) and Jaime Awe (Northern Arizona University)**

**[165]**

*Classic Maya Agriculture and Traditional Milpa-Cycle Practices in the Upper Belize River Valley*

The Classic Maya polities of the Upper Belize River Valley were situated in an especially rich alluvial environment, which may have served as a breadbasket for surrounding regions. The region was also one of the most densely settled regions of the Maya lowlands, showing evidence of substantial populations from the Middle Preclassic (900–300 BC) through to the Terminal Classic collapse (AD 750–900). Reoccupation during the Late Postclassic (AD 1200–1521) likely reflects this agricultural potential. While numerous theories about surplus production of staple crops like maize or cacao for export have been proposed for the region, questions remain about the agricultural techniques used to support large populations and generate surplus. Intensive forms of landesque capital are largely absent except for an isolated ditched-field system and some small terraces, suggesting a reliance on traditional milpa-cycle practices. This study quantifies available space suitable for milpa-cycle agriculture around Classic Maya households and estimates the associated crop yields to assess the degree to which such agricultural practices could fulfill the caloric needs of the population, and potentially generate a surplus. This study provides a springboard to begin answering questions about the role of agricultural production in political economy and trade and exchange.

Walden, John [129] see Ebert, Claire

Walden, John [101] see Ellis, Olivia

Walden, John [228] see Hoggarth, Julie

Walden, John [76] see Meyer, Brett

Walder, Heather [6] see Hawkins, Alicia

Walker, Cam [179] see Mack, Joanne

**Walker, Cameron (University of Maryland, College Park) and Barnet Pavão-Zuckerman (University of Maryland, College Park)**

**[190]**

*Animal Husbandry Practices at the Musgrove Cowpens (9Ch137)*

The Musgrove Cowpens (9Ch137) was a rural cowpen and trading post established along the Savannah River by the Creek/English trader and interpreter Mary Musgrove (Coosaponakeesa). This location was an ideal trading location between Charleston and Savannah, and placed the post on an estuary, providing an

environment rich with natural resources. Excavated by Southeastern Archaeology Inc. in 2002, two faunal analyses (2008 and 2022) of material from two contemporaneous cellar features have highlighted aspects of Mary's ownership between 1732 and 1746. Expanding on an interdisciplinary National Science Foundation project on Charleston's cattle meat economy, this paper highlights the mortuary profiles derived from postcranial measurements of both cattle and deer individuals to indicate Musgrove's role in the deer-skin trade and cattle economy. Having such a rich faunal assemblage dated to Mary Musgrove's ownership provides essential insights into rural contributions to colonial economic systems, colonial impacts on environmental change, and potential shifts in animal-human relationships in the Lowcountry.

Walker, Deborah [189] see Lockett-Harris, Joshua

**Walker, Debra (University of Florida)**

**[243]**

*Household Pottery from Aventura, Belize*

Household pottery from recent excavations at Aventura informs our current understanding of life near Chetumal Bay, its resilient villagers situated within a larger boom-and-bust economy. Although Preclassic pottery has been found near bedrock in some household excavations, construction began in earnest about 200 CE in the Early Classic period. A major expansion began sometime after 400 CE. This vibrant Middle Classic period revealed evidence for technological innovations exploited by residents as they engaged in large-scale trading ventures throughout the Late Classic, including local double-mouth jar production and market trade in commodities such as salt. Waterborne trading around Chetumal Bay, and perhaps further north, is evident in a shift away from the Petén-centered Tepeu ceramic sphere. By the Late Classic, Aventura was making and using pottery similar to sites in southern Quintana Roo, such as Calderitas and Oxtankah. These northern connections remained with the collapse of coastal-inland trade in the Terminal Classic. Postclassic households were first documented in 2022, and seem to have been ephemeral compared to the regional political center at Santa Rita Corozal only a few kilometers to the north.

Walker, Debra [243] see Wong, Eponine

**Walker, John (University of Central Florida)**

**[110]**

*Moderator*

Walker, John [25] see Robinson, Charlotte

**Walker, Leslie (Linfield University)**

**[190]**

*Chair*

**Walker, Leslie (Linfield University)**

**[190]**

*All Is Never Lost: Examining Coalescence, Cultural Resilience, and Survivance in the Archaeology of a Protohistoric Village on the Arkansas River*

Archaeologists often approach the contact period in the Americas, and subsequent upheavals, with a sense of melancholy at a world supplanted in our own becoming. While contact and the ensuing centuries of colonization certainly brought trauma, significant loss, and destabilization to Indigenous cultures, the experiences of Native people of this period need not always be framed as a history of elimination and suffering. Instead, archaeologists working in these contexts are uniquely positioned to examine cultural resiliency and survivance through expressions of continuity and reimagining of tradition. Evidence from

architecture, art, and technology produced at Carden Bottoms, a seventeenth-century village on the Arkansas River, demonstrates this. While communities undoubtedly suffered due to the impacts of contact, they also relied on long-standing practice and tradition, as well as innovation, to propel themselves into the future. Careful excavation of houses here reveals the coalescence of area cultures and their role as active agents in ensuring their own cultural resilience and survival in the face of unprecedented challenges, as well as the power and agency of material culture in navigating such turbulent times.

Walker, Robert [88] see Gala, Nicholas

**Walker, William (New Mexico State University)**

[230]

*Chair*

**Walker, William (New Mexico State University) and Judy Berryman (New Mexico State University)**

[230]

*Regional Comparison of Ritual Closure in American Southwest*

Archaeologists in the North American Southwest and other regions recognize that ritual closure of structures reveals information about relations with ancestors, fear of dangerous forces, and other interactions between spiritual and material realms. We want to understand how such ceremonies might differ through time or place. Perhaps they form regional traditions that offer insights into ritual variability. Alternatively, these rituals might transcend local culture boundaries and highlight processes in the rise and spread of new religions. To begin compiling and exploring these possibilities, we focus on culture branches of the Mogollon Region of the North American Southwest including the San Simon, Black River, Forestdale, Cibola, Mimbres, Jornada, Chihuahua, and Eastern Periphery branches. We are particularly interested in comparing domestic and ritual structure closure as well as the patterning of specific artifact types such as projectile points, shell, pigments, and crystals.

Wall, Bridget [10] see Ross, Douglas

Wallace, Glenna [136] see Nolan, Kevin

Wallick, Rose [62] see Keith, Mackenzie

**Walls, Matthew (University of Calgary), Mari Kleist (Ilisimatusarfik/University of Greenland), Remi Mereuze (University of Calgary) and Cecilia Porter (University of Calgary)**

[173]

*Prioritization Frameworks and Archaeological Decision-Making in a Changing North*

The impact of climate change on heritage sites is a subject that is discussed with increasing urgency in arctic archaeology. Frequently used metaphors like “burning libraries” or “ticking clocks” capture the visceral feeling of loss experienced by both archaeologists and Inuit communities who witness destructions firsthand. Amid calls to action, however, it is critical to retain the commitment to community-driven research that has been at the core of many arctic projects over the last 20 years. Particularly when discussed as a crisis of “global heritage,” there is a risk that emergency-driven archaeology can re-center decision-making to the campus. Tough choices are ahead, and we identify a need for prioritization frameworks that determine archaeological objectives according to Inuit-driven needs in the present. We outline the consequences of imposed environmental regulations for the Inughuit community in Avanersuaq, Greenland, as an example

where archaeology can be productively mobilized. Certain sites are more likely to provide insight on Inughuit-environment relationships through time and, as such, have higher value in displacing the trope of a pristine and empty Arctic. In this context, we draw on fieldwork data to discuss how prioritization frameworks can be coproduced between archaeologists and communities.

**Walsh, Justin (Chapman University), Alice Gorman (Flinders University), Shawn Graham (Carleton University) and Chantal Brousseau (Carleton University)**

[55]

*Archaeology in Outer Space: The Sampling Quadrangle Assemblages Research Experiment (SQuARE) on the International Space Station*

On 14 January 2022, NASA astronaut Kayla Barron placed adhesive tape on the walls of the International Space Station (ISS), marking the sample locations for the first archaeological work to be conducted in outer space. Over 60 days, ISS crew documented the station's in situ material culture through daily photography of six areas. This payload, developed by the International Space Station Archaeological Project (ISSAP), and sponsored by the ISS National Laboratory, was called the Sampling Quadrangle Assemblages Research Experiment (SQuARE). The concept of SQuARE is derived from one of the most elementary terrestrial archaeological sampling techniques, the shovel test pit. Roughly square sample locations were defined in contexts nominally associated with science, work, hygiene, and eating, in order to understand how those spaces were actually used over a two-month period. ISSAP has analyzed 358 photos from SQuARE, identifying and locating each object within the squares in each day's photo, using a purpose-built web tool. This work allows us to identify patterns of behavior and adaptation to the space environment, including isolation, confinement, and microgravity. The data generated will also be used to study decades of historic photos of life on ISS.

Walsh, Matthew [184] see Prentiss, Anna

Walsh, Megan [205] see Cerezo-Román, Jessica

Walsh, Megan [17] see Prufer, Keith

Walston, Lee [94] see Wescott, Konnie

Walthall, Alex [54] see Flood, Jonathan

Walz, Jonathan [210] see Sarathi, Akshay

**Walzer, Mariah (Utah State University)**

[75]

*Using Historic Maps to Locate Trails and Understand Trail Building Practices on the Willamette National Forest, Detroit Ranger District*

In the 1930s and 1940s, Civilian Conservation Corps (CCC) crews built many fire lookout towers and trails on the Willamette National Forest and across the nation. Some of these structures and trails still exist today, but others have been lost to time. Digitizing historic trails from old maps may help cultural resource crews to relocate and protect them. However, only tracing the trails from the maps often proves inaccurate on the ground. This project seeks to compare digitized trails to least cost paths and corridors to attempt to identify factors that influenced trail construction and may help align the digitized trails to the landscape to increase the likelihood of rediscovery on the ground. Results indicate that historic trails rarely align with least cost

paths but do often fall into 10% least cost corridors. The differences are likely influenced by preferences for shorter paths and avoiding streambeds. Further, historic trails and lookouts should be understood and examined as networks instead of individual resources.

**Wampler, Marc, Steve Martin (Wood E&IS), Bridget Mohr (Wood E&IS), Allison Soergel (Wood E&IS) and Nancy Ross-Stallings (Wood E&IS)**  
[102]

*Archaeological Relocation of Five Historic Cemeteries in North-Central Tennessee*

In Spring of 2020 Wood E&IS embarked on the removal and relocation of graves associated with five late nineteenth- early twentieth- century historic cemeteries located in rural north-central Tennessee. The cemeteries were deemed eligible for the National Register; therefore, graves were removed archaeologically. Each cemetery was mapped using noninvasive geophysical techniques to locate unmarked burials. Archival and genealogical research revealed that the decedents are associated with the local historic Odom's Bend African American community. A total of 118 burials were meticulously excavated and removed. Reburial of remains was conducted in consultation with descendants and replicated patterns recorded in the field. Human remains and artifacts within the individual graves were documented using 3D photogrammetry techniques. The historical record of this African American community is limited. Significant contributions on the African American life experience in this region of rural Tennessee can be greatly enhanced through the results of these investigations. The ongoing research is focused on the health of the population through skeletal biological analysis, African American mortuary customs, socioeconomic status, and a host of other research questions. A synthesis of archival research and results of osteological and artifact analysis serves to 'tell the story' of this forgotten African American community.

**Wandsnider, LuAnn (University of Nebraska)**  
[96]

*"Like Mushrooms after Rain": Learning the Land on the Late Nineteenth-Century Central Great Plains (USA)*

After the Civil War, settlers moved into a Great Plains landscape from which Native Americans had been extirpated; i.e., a foreign land with few local experts. In the case of late nineteenth-century Custer County, Nebraska, settler towns sprang up and disappeared "like mushrooms after rain." Settlers initially sought out "old-timers" and acted on their traditional ecological knowledge (TEK). They incorporated new technologies (e.g., windmills, barbed wire), expanding the human-modified landscape outside of well-watered valleys. Settlers were well connected to others via local institutions and to the world system via newspapers and railroads, enhancing their ability to learn. Innovating individuals were celebrated, and, with inter-ethnic marriage and communities, conceivably, TEK evolved. Confronted by the severe climatic and economic challenges of the 1890s, settlers pursued well-researched risk management strategies, including abandonment. The archaeological signatures of the lessons for living in a foreign, demanding grassland are highlighted.

Wang, Chunxue [70] see Liu, Hailin

Wang, Chunxue [41] see Wang, Jiaqi

Wang, Chunxue [122] see Yu, Xin

Wang, Chunxue [28] see Zhang, Xuewei

Wang, Fen [216] see Underhill, Anne

**Wang, Jiajing and Laura Ng (Grinnell College)**  
[51]

*An Intimate Bond: New Evidence for Human-Pig Relationships in Chinese Diaspora Communities*

Pigs and humans have formed a mutualistic and symbiotic relationship since antiquity. In North America, large

quantities of pig bones have been recovered from Chinese diaspora sites, indicating the importance of pigs to Chinese immigrant foodways. By analyzing pig dental calculus from Los Angeles Chinatown (1880–1933) excavations, this study reconstructs the pig management practice at the site. Analysis of food micro-remains suggests the Chinatown residents raised their own pigs within or near households, instead of purchasing from non-Chinese butchers. How did pig husbandry and co-inhabitation shape the daily lives of the Chinatown residents? How did pigs play a role in the Chinese negotiation of social identity and economic needs? Using a multispecies framework, this study explores an interdependent relationship between pigs and early Chinese immigrants and discusses how that relationship affected the overall functioning of Chinese diaspora communities during the Chinese Exclusion Era (1882–1943).

**Wang, Jiaqi (Jilin University), Xuewei Zhang, Chunxue Wang and Lishuang Sheng [41]**

*A Preliminary Report of the 2021 Excavation at the Taiziling Locality in Jizhou County, Tianjin City*

The Taiziling locality, buried in the second terrace near the Prince Mausoleum of the Qing Dynasty is located in the Sungezhuang village, Jizhou County, Tianjin City, which was discovered in 2005 and excavated in October 2021, covering an area of 50m<sup>2</sup>. In this excavation, over 100 artifacts were unearthed. The lithic assemblage includes cores, flakes, chunks, debris, and tools, with the representative tool being scrapers, which is widely found in the remains of Paleolithic sites in northern China. The raw materials of the lithic artifacts were quartzite, quartz, flint, etc. As shown by the characteristics of the cores and flakes from Taiziling locality, two distinct technological assemblages are identified. One is flake technology, which is the local and dominant technological assemblage in North China, characterized by free-hand core reduction without preparation and simple tool modification. The other is microblade technology, which is represented by microblade cores with working surfaces for the production of micro-blades. The Taiziling locality provides important data for the study of lithic techniques in the Late Pleistocene in North China as well as the cultural relationship between northern and northeastern China during the period.

Wang, Jiaqi [28] see Zhang, Xuewei

Wang, Jinping [102] see Sun, Xiaofan

Wang, Long [29] see You, Sen

Wang, Qian [102] see Sun, Xiaofan

**Wang, Yucheng (University of Cambridge), Bianca De Sanctis (University of Cambridge), Ruairidh Macleod (University of Cambridge), Pavel Tarasov (Freie Universität Berlin) and Eske Willerslev (University of Cambridge) [53]**

*Sediment Environmental DNA (eDNA) Analysis of Lake Ochaul*

Detailed reconstruction of paleo-ecosystems is the key for understanding the interactions of climate changes, ecological variation, and human activities. In this study, we applied novel environmental DNA (eDNA) shotgun metagenomics methods on the ancient eDNA isolated from the lake sediments of Lake Ochaul, a small lake in east Siberia located to the west of Lake Baikal, to reconstruct the comprehensive ecological successions of the region in late-glacial and Holocene (from 13.3 to 4.2 thousand years BP). Main findings include (1) a quick and intensive vegetation turnover occurred during the Pleistocene/ Holocene transition, from dry steppe to a mix of wetland aquatic and peatland plants; (2) no big-body mammals detected; animal taxa were instead mainly birds, fishes, and insects, which had a higher diversity in the Holocene; and (3) microbiota also responded to the climate changes, but different microbial communities changed differently.

Wang, Zhiyou [67] see Tang, Liya

**Wann, Kevin (Texas A&M University)**

[163]

*Exploring Wild Avocado Germplasm through Herbarium Genomes*

The avocado has a complicated evolutionary history resulting from landscape-level management and domestication practices. Cultivars of the species are well-documented and categorized into three botanical races based on genetic differentiation, morphology, and adapted environment. However, we have very little knowledge of the avocado's genetic variation purely in the wild. Previous efforts to explore its wild population structure have largely only included individuals collected from germplasm complexes, and thus represent a limited geographic scope and likely harbor a biased number of domestic variants. The main objectives of this study are to establish a genetic biogeography of wild avocado and compare whole-genome sequences of wild germplasm with that of modern cultivars. I will accomplish this through the extraction and analysis of recent historic (<60 yrs) genomes housed at various herbaria across the USA. These herbarium specimens were collected from probable wild locations representing the full geographic range of the species. With these sequences, I will identify novel wild genetic variants to establish the true wild population structure of the species, estimate levels of wild genetic diversity and crop-wild gene flow, and detect candidate genetic loci under domestication. This study will bolster archaeological studies of domestication origins and assist future breeding efforts.

Ward, Stacey [228] see Rangel de Lázaro, Gizeh

Warinner, Christina [29] see Khachemoune, Nour

Warinner, Christina [71] see Millien, Sebastian

Warinner, Christina [118] see Richter, Kristine

**Warner, John**

[19]

*New Interpretations from the Site of Jatanca (JE-279), Jequetepeque Valley, Peru*

The Late Formative period site of Jatanca (JE-279) is located along the North Coast of Peru within the southern bank of the Jequetepeque River Valley. Initially, this site was examined sporadically by a small number of archaeologists who conducted limited surface survey and some small-scale excavations. In 1997, Tom Dillehay, along with a select group of colleagues from North and South America, initiated a large-scale survey (1997–2000) within the Jequetepeque Valley that encompassed the immediate area surrounding Jatanca, and resulted in the first accurate understanding of how JE-279 fit within the geographical landscape. Subsequent work at Jatanca, inspired by Dillehay's initial direction, has continued to refine our understanding of this important early site and the role that it played within the cultural development of the North Coast. Considering new data and theoretical perspectives, this paper will examine a few of the ever-changing interpretations associated with the surrounding landscape and architecture of Jatanca, as initially inspired by Tom Dillehay.

**Warner, Mark (University of Idaho) and Katrina Eichner (University of Idaho)**

[98]

*Stealth Archaeology: Making the Case for Relevance in Idaho*

One of the unacknowledged challenges of decolonizing archaeology is recognizing the external political realities in which some professionals work. Working in a state that has explicitly expressed skepticism about the suitability of anthropology as an appropriate field of study can present communicative challenges. However, over the past several years the University of Idaho's "Idaho Public Archaeology" (IPA) project has

consistently engaged several thousand of our state's citizens through archaeology. What this publicly engaged work has accomplished is a sustained consciousness-raising about the utility and relevance of historical archaeology for citizens throughout the state.

Warner, Mark [117] see Campbell, Renae

**Warner, Monica (University of New Mexico) and Nicholas Herrmann (Texas State University)**  
[45]

*Interpreting Precolumbian Mobility in Eastern Honduras Using Strontium and Oxygen Isotope Assignment Models*  
Eastern Honduras was and is a culturally diverse region on the southern periphery of Mesoamerica. Limited research has been conducted in this region, especially when compared to the Maya in western Honduras. We present isotopic data from individuals interred at two sites, Cueva del Río Tagua and Cueva de las Arañas, which were primarily used during the Middle Formative period.  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $\delta^{18}\text{O}$  phosphate isotope values are used to reconstruct precolumbian mobility in eastern Honduras, which assist in interpretations of sociocultural and political organization, kinship alliances, and settlement patterns. Circum-Caribbean isoscapes are used to assign the  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $\delta^{18}\text{O}$  results from 37 individuals interred at the caves. The  $^{87}\text{Sr}/^{86}\text{Sr}$  data suggest that many of the individuals originated from nearby communities, correlating to geological isotope signatures from the Tagua and Jamasquire Village sites. One individual has been identified as a “nonlocal” from both the quantitative assignment models and experimental techniques. Overall, the biogeochemistry data suggest residential mobility within the Olancho Valley and possible evidence of kinship interactions within the surrounding communities.

**Waski, Nadia and Zachary Nason (SWCA Environmental Consultants)**  
[26]

*Urban Archaeology at the Harrison Avenue Residences: A “Glimpse” into Immigrant Communities in Nineteenth-Century Boston, Massachusetts*  
Intact cultural deposits providing a “glimpse” into domestic life in rapidly transitioning urban communities, such as Boston, are rare archaeologically. The constant, natural movement of people in city landscapes complicates results of excavations at these urban archaeological sites. Investigations in 2020 and 2021 by SWCA Environmental Consultants at the proposed Harrison Avenue Residences, in downtown Boston, identified a sheet midden (Feature 1), associated with the nineteenth-century immigrant communities residing in a series of former row houses. Documentary research, in conjunction with artifacts recovered from the midden, was interpreted, contextualizing the excavated material. With the lack of a formal data recovery for the site, archaeologists are left to question what characteristics define the significance of urban archaeological sites? How can complex, stratified urban sites, such as this one, help us to reexamine and challenge the way we interpret these historically quickly transitioning urban populations?

**Watanave, Aldo (University of Florida)**  
[82]

*Chair*

**Watanave, Aldo (University of Florida), Michelle Watanave, Elvis Monzón and Sintia Santisteban**  
[82]

*First Insights into the Life of Menocucho: Results of the Archaeological Excavations at Huaca Menocucho, Peru*  
In this paper, the authors will present the results of their first excavation season at Huaca Menocucho, in the Moche Valley on the north coast of Peru, exposing the political, religious, and economic activities carried out by the people who lived at the site. This excavation revealed the site was first occupied during the Initial period (1800–500 BC), followed by a heavy Salinar occupation (400–50 BC), and finally sporadic occupations throughout the Middle Horizon period (AD 650–1000). Investigations also revealed the site's connection

with other populations on the coast and in the highlands. The connection with the coast is crucial to consider judging by the number of saltwater shells, fish bones, and a shark tooth found during excavations. The presence of minerals and ceramic fragments with highland styles further demonstrates a connection with the highlands. The authors also will present the first absolute dates of the site, which will solidify the site chronology and corroborate the timeline of the distinct architectural components identified, which are believed to have been built during different time frames. The results of this first excavation will continue to be elaborated upon as excavations are completed in subsequent years.

Watanave, Aldo [70] see Guzman Garcia, Milena

Watanave, Michelle [70] see Guzman Garcia, Milena

Watanave, Michelle [82] see Watanave, Aldo

Waters, Michael [121] see Jones, Lauren

**Wathen, Kelli, Alex Morrison (Applied EarthWorks, Inc) and Michelle Wienhold (Applied EarthWorks Inc.)**

**[74]**

*Creating a Geospatial-Temporal Database for California's Central Coast*

California's Central Coast is characterized by a variety of environments that would have offered indigenous peoples a plethora of resources for nearly 10,000 years. Over the course of nearly a century of archaeological investigations, thousands of sites have been identified in the region. Since the 1950s, radiocarbon dating has offered relatively precise absolute age estimates for site occupations. In addition to chronological estimates, landscape archaeology has extended the unit of analysis to spatial units encompassing multiple sites across a diversity of environmental zones. Bridging spatial and temporal data offers an insightful picture of the prehistoric regional chronology of the central coast region. To achieve this goal, this project presents novel and innovative methods for combining spatial and temporal data into a single digital platform incorporating the location of approximately 2,000 archaeological sites within the counties of Santa Barbara, San Luis Obispo, and Monterey. Moreover, more than 600 radiocarbon dates are also included with the spatial data in a single comprehensible structure. Finally, this geospatial-temporal database framework can incorporate newly identified sites and radiocarbon dates resulting in a flexible and dynamic tool for archaeological research.

Wathen, Kelli [75] see Wienhold, Michelle

**Watkins, Joe (Archaeological and Cultural Education Consultants)**

**[153]**

*Japanese or Ainu? Does the Term "Jomon" Delegitimize the Ainu as an Indigenous People?*

Some politicians and writers in Japan have proposed that the Jomon are the cultural precursors of the contemporary Japanese, while others recognize the Ainu as the descendants of the Jomon people of Hokkaido. Japan's "Jomon archaeological culture" helps create conflicting interpretations and influences the expansion of contemporary Japanese nationalism. This paper discusses the role of the term "Jomon" as it has been applied to archaeological cultures in Japan and elsewhere. It includes a brief discussion on the utility (or problems) with identifying archaeological cultures, and then offers a case study on the more recent use of such concepts to rewrite one group's past at the expense of another's. Some contemporary Japanese have claimed "We are ALL Jomon" as a means of questioning whether the Ainu—the recently recognized Indigenous people of Japan—should have any "special rights" not available to all other Japanese. Thus, archaeology needs to continue to clarify the way it presents the concept of archaeological culture so that such issues might be better understood by general populations.

**Watkins, Tia (University College London)**

[193]

*Discussant***Watkins, Tia (University College London), Rosamund Fitzmaurice (University College London), Christophe Helmke (University of Copenhagen), Jaroslaw Zralka (Jagiellonian University) and Jaime Awe (Northern Arizona University)**

[28]

*Regional Spheres of Gameplay: A Preliminary Comparative Analysis of Patolli, a Mesoamerican Board Game*

The precolumbian game of patolli was imbued with ideals of competition, risk, and ritual significance. The board game had a widespread presence across Mesoamerica throughout the Classic period (~ AD 250–820) and was often etched into the surfaces of monumental architecture. Recent excavations led by the Belize Valley Archaeological Reconnaissance project at the Maya site of Xunantunich have yielded the second most extensive collection of patolli yet recorded at a given site. The Xunantunich patolli assemblage presents a variety of board sizes and placement locations; however, the board styles adhere only to the Type II style and do not represent any other types in patolli board typology. This poster presents a comparative analysis of patolli boards found in central Belize and the neighboring Petén region to assess greater patterns in patolli type, regional location, and associated material culture and architecture. These variables allow us to better understand the sociocultural significance of the game and the individuals partaking in the game while also contributing to the broader archaeological discourse on human behavior and agency.

Watkins, Tia [28] see Saldaña, Gabriela

**Watling, Jennifer (University of São Paulo), Tiago Hermenegildo (Cambridge University), Thiago Kater (University of São Paulo) and Fabian Menges (Yale University)**

[20]

*Preliminary Insights into the Biocultural Trajectory of Maize in Southwestern Amazonia*

Mounting archaeobotanical and archaeogenetic data show that the southwestern Amazon region had an important role to play in the history of South American maize dispersal, acting as a “secondary improvement center” for primitive lineages that arrived in the region during the Middle Holocene (>6500 BP). How these people-maize interactions played out over time and space is still unclear due to significant gaps that exist in the archaeological and archaeobotanical evidence, exacerbated by unfavorable organic matter preservation. Meanwhile, the presence of an indigenous maize landrace with unusual primitive traits, endemic to the region, offers a tantalizing testimony to thousands of years of these accumulated interactions. This presentation draws on several lines of evidence to first review what we do and don’t know about maize evolution and its role in the lives and resource management systems of southwestern Amazonian groups. It then offers recent data in the form of phytolith, starch grain, and residue analyses that point to differences in the cultural uses of maize over time—factors likely to have played a role in the biocultural trajectory of this crop.

Watson, James [97] see Chen, Jennifer

**Watson, Keli, Dana Evaschuk (Pathfinder Endeavours), Marina Elliott (University of Calgary) and Mike Robertson (Cheslatta Carrier Nation)**

[205]

*The Ancestral Remains of the Cheslatta T'en: A Rare Burial Site from the Middle Holocene in Central British Columbia*

In the fall of 2020, human ancestral remains were discovered eroding out of the bank of a lake within the traditional territory of the Cheslatta Carrier Nation, at the northern end of the Canadian Plateau. In 2021 more remains were found at the same location. At the request of the Cheslatta t'en archaeologists conducted salvage excavations to protect and preserve the ancestral remains and to gain a better understanding of the site and the impact of the ongoing erosion there. Working with and for the Cheslatta

t'en, a rare mortuary occurrence is being documented. The burials of at least six individuals have been radiocarbon dated to a period around 4500 BP, making this one of a very few burial sites identified on the Canadian Plateau from this period. This paper will discuss these findings in the context of the osteological analysis of the remains, and discuss the potential for stable isotope and DNA analysis. We will also highlight how being an Indigenous led project has provided direction and focus to the scientific analysis, thereby letting the archaeology be a tool for the Nation in their efforts to reclaim their land and their past.

Watson, Keli [127] see Evaschuk, Dana

**Watson, Sara (University of California, Davis)**

[169]

*Chair*

**Watson, Sara (University of California, Davis), Peiqi Zhang (University of California, Davis), Patricia McNeill (University of California, Davis) and Katie Wyatt (University of Arkansas)**

[169]

*Modeling Mobility and Lithic Raw Material Transport in the Late Pleistocene along the Southern Coast of South Africa*  
Understanding how hunter-gatherer groups move around the landscape is essential for answering questions about human behavioral ecology and evolution of the social landscape. Lithic raw material proveniencing sheds light on how far people in the past were traveling for toolstone and whether people from different sites were accessing the same raw materials but can be challenging. We applied digital methods for spatial analyses to create predictive models of raw material source access for silcrete for three late Pleistocene sites in South Africa, two coastal and one inland. Silcrete, a terrestrial sedimentary rock, is rare along the southern coast of South Africa and becomes more common inland at higher elevations. The discrete outcrops of silcrete and its relatively low frequency on the landscape provide an opportunity for geochemical proveniencing. We performed least-cost analyses to determine which sources people from each site should acquire silcrete raw materials from if they are trying to access the least energetically costly sources based on terrain and distance to source. Future research will include collecting samples from these locations and comparing the geochemical composition of collected samples with silcrete artifacts from the sites to see if the artifacts come from the modeled raw material collection locations.

**Watterson, Alice (University of Iceland)**

[173]

*Community, Co-design, and Climate: Case Studies in Designing Public Outreach for Arctic Archaeology*  
Archaeological visualization—the task of picturing the past in the present—exists at the intersections of data collection, interpretation, local perspectives, and artfully crafted storytelling. This type of science communication and public engagement work forms a core dimension of archaeology today, particularly for projects integrated into community-focused contexts. Drawing on case studies from climate change-impacted archaeology with communities in Alaska and Greenland, this paper will reflect on the processes behind the coproduction of creative media for outreach and engagement. It will discuss the successes and challenges of co-curation and multivocality in practice, considering how we ensure that the outcomes of our scientific practice remain relevant and impactful for the communities we work within. Ultimately, addressing what role creative media can play in addressing ever evolving challenges in heritage and climate change communication, source community representation and the creation of new knowledge and meaning for archaeological narratives.

**Watts, Corinne (University of Iowa)**

[42]

*New Stones, New Uses: Sillimanite Ground Stone Tools from Central Iberia (5000–2500 BCE)*

Ground stone tools can indicate important patterns in food production, craftwork, and farming practices in

Neolithic and Chalcolithic Iberia due to their varied use. As Iberian communities adopted sedentary practices and social inequalities emerged, they began to create tools made from new raw materials, indicating a changing relationship with their environment. Fibrolitic sillimanite, an aluminum silicate mineral found in metamorphic environments, is one example of these new materials. Fibrolitic sillimanite was used to create durable ground stone tools throughout the Madrid region. Nodules of this mineral were likely locally available in the Somosierra mountain range and rivers running through the central region of Iberia. These minerals were used to create polished axes, knife sharpeners, and other tools. My preliminary research focuses on the physical and use-wear data of two collections of ground stone tools from the Museo Arqueológico Regional de la Comunidad de Madrid in Alcalá de Henares and the Museo de San Isidro in Madrid, Spain. Together the 280 artifacts from approximately 60 settlements, surface scatters, and workshops present a cross section of the variation in new raw material sources, the creation of new tool forms, and the use of ground stone tools in the region.

**Waxman, Ryan (University of Massachusetts, Amherst)**

[101]

*Meaning beyond Capital: Life in a Twentieth-Century Mining Town*

[WITHDRAWN]

**Wayman, Joseph (Independent Researcher)**

[151]

*Several Fallacies Handicap Thinking Regarding Pleistocene LCTs: For Example, the Victorian Pet Name “Handaxe” Has Biased Minds with Assumed Behavior for 150 Years*

Several persistent fallacies have resulted in truncated and stagnated development of thought regarding lithic large cutting tools. First, the big one: the Victorian era nickname “handaxe” is nearly ubiquitous, hides as a clever and well-known and harmless handle for the whole tool class, but stealthily, and mainly without questioning, presupposes that the devices were hand tools. Second, many researchers who have also stated that there is no clear explanation for these Pleistocene lithic tools also argue the devices were over-engineered. If A is true, we cannot conclude B. Third, there is a regard that the persistence of the device largely unchanged for more than a million years, indicate stagnation of thinking, of development. This fallacy is akin to regarding something common and persistence in our own technology as “going on too long”; such as thinking that the axle has been used for too long. Can’t we come up with another solution? Long-term persistence just indicates that the device remained useful. There are others.

**Weahkee, Mary, Edward Jolie and Benjamin Bellorado**

[248]

*Reintroduction of Ancient Archaeological Footwear Back into the Modern Pueblo World*

Until recently, the memory of ancient footwear traditions was only retained in the oral histories and stone-hewn writings of Pueblo scholars. Previous interpretations have suggested that footwear was as an everyday item used only to increase mobility and ensure survival in diverse surroundings. For Pueblo people, ancestral footwear was and is a spiritual item that held significance not only in life but in the practice of preparation for crossing over at death. Archaeologists have little data on how ancient footwear was used and worn, and how its use effected wear-and-tear on the sandals or the feet that wore them. This presentation discusses efforts to reintroduce two styles of ancient footwear to Pueblo communities. Replication of the manufacturing techniques and experimental use of two styles of yucca sandals has prompted the curiosity of both anthropologists and Pueblo peoples alike. The goal of my work is to relate the elegance of ancient footwear technology and design to Pueblo and non-Pueblo audiences and to revitalize the production and use of traditional yucca sandals for Pueblo people.

Weahkee, Mary [232] see Greenwald, Alexandra

**Weaselboy, Marissa (Yomba Shoshone Tribal Citizen)****[144]***Discussant***Weber, Andrzej (University of Alberta; Aix-Marseille University; Irkutsk State University)****[53]***Discussant***Weber, Andrzej (University of Alberta; Aix-Marseille University; Irkutsk State University) and Olga Goriunova (Irkutsk State University)****[53]***Early Bronze Age Cemeteries on Lake Baikal, Siberia: Their History and Patterns of Use*

Prehistoric hunter-gatherer cemeteries are usually analyzed as one chronologically flat block of data representing certain groups of people. While justified by small sample sizes or dating problems, such an approach is obviously ahistorical in that it denies these cemeteries and hunter-gatherer groups their own unique history. The aim of the Baikal Archaeological Project is to look at patterns of hunter-gatherer cemetery use from Late Mesolithic to Early Bronze Age (~8600–3500 cal BP) in the Baikal region, Eastern Siberia. Radiocarbon dating of all individuals from a given cemetery (currently, ca. 560 dates from 65 cemeteries representing five distinct mortuary traditions) allows for the examination of the overall tempo of burial events at each cemetery or a group of cemeteries and for comparison to one another. Combined with other categories of mortuary data, this radiocarbon evidence offers insights into the history of a given cemetery at an unprecedented level of detail. The most important discovery is that each cemetery seems to tell a different story about the people who used it and their contribution to the functioning of the broader microregional or regional population. This paper details the history of one Early Bronze Age cemetery with a particularly interesting pattern of use.

Weber, Andrzej [53] see Hyland, Corrie

Weber, Andrzej [53] see Lieverse, Angela

Weber, Andrzej [53] see Macleod, Ruairidh

Weber, Andrzej [53] see Werens, Karolina

Weber, Gerhard [214] see Tejero, José-Miguel

**Weber, Sadie (Universidade de São Paulo) and Matthew Sayre (High Point University)****[223]***Follow the Llamero: The Movement of Plant Foodstuffs in the Andes*

The exchange of goods and movement among different ecozones is a hallmark of Andean society. Key to this system of mobility were camelid caravans, which are possibly best known for the Wari or Tiwanaku cultures but are today dwindling in frequency or have disappeared in the Andes. These caravans were established in the much earlier Formative period (ca. 1800–200 BCE) when they were used to transport goods among different ecozones. Here, we present the results of microbotanical and stable isotope analyses to elucidate the nature of the long-distance movement of perishable foodstuffs. We demonstrate the presence of non-highland plants at highland archaeological sites and suggest that camelid caravans were used to move bulky, perishable foodstuffs. We also demonstrate the utility of multiple lines of evidence in tracing exchange and movement in the Andes.

Webster, David [125] see Gonlin, Nancy

**Webster, Laurie (University of Arizona)****[206]***Refining the Chronology of Basketmaker II Perishable Craft Production in Southeastern Utah*

During the past decade, the Cedar Mesa Perishables Project has documented nearly 5,000 perishable artifacts from alcoves in southeastern Utah. As part of this work, the project has generated about 100 radiocarbon dates from well-preserved woven textiles, sandals, baskets, wooden implements, and other perishable items from the Grand Gulch, Butler Wash, Allen Canyon, and Glen Canyon areas, resulting in the largest dataset of directly dated perishable artifacts from this region. With 80% of the sample represented by Basketmaker technologies, these data offer new insights into the origins and development of early Ancestral Pueblo perishable technologies; the cultural practices, technical knowledge, and learning networks of these early weavers and woodworkers; and a more nuanced understanding of long-term technological and stylistic change in Basketmaker perishable craft production for the period 200 BC–AD 700.

Webster, Laurie [248] see Bellorado, Benjamin

Webster, Laurie [246] see Geib, Phil

**Webster, Serena, Andrew Somerville and Marion Forest****[100]***The Obsidian Trade at Teotihuacan: pXRF Analysis of Changes in Source Location over Time*

Obsidian played an important social and economic role in ancient Mesoamerica. Because obsidian is a relatively homogenous material, chemical analyses can quantify its elemental concentrations and determine source locations of individual artifacts. This study investigates sources of obsidian procurement at the ancient metropolis of Teotihuacan in central Mexico through the use of a portable X-Ray fluorescence instrument (pXRF). The research focuses on obsidian artifacts recently obtained from surface collection and from the excavation of stratified deposits at the Teotihuacan neighborhood of Hacienda Metepec, located on the eastern margin of the ancient city (NIE7). In total 378 obsidian artifacts, representing blade, projectile points, cores, and scrapers, were analyzed by pXRF during the summer of 2022. Chemical compositions are compared with those of known geological sources to identify changes in the raw material source locations over time and to assess whether particular artifact classes more frequently associate with particular source locations. Samples are grouped according to levels associated with Xolalpan (AD 350–500), Metepec (AD 500–550), Coyotlatelco (AD 550–850), and Mazapan/Aztec ceramic phases (AD 850–1500), as well as artifact type. Results increase our understanding of the trade networks at Teotihuacan and how they changed during the Epiclassic to Classic transition.

**Wedemeyer, Rachael (University of California, Riverside) and Kenichiro Tsukamoto****[183]***Navigating the Daily Lives in Plazuela Groups: Early Excavations in the López Plaza at the Classic Period Maya Site of El Palmar, Mexico*

The data presented in this paper are results from the 2022 field season at the López Plaza, a small plazuela group located within the site center of El Palmar. Fieldwork included test pit excavations, shovel test pits, and geophysical prospections. Lidar images show that the López Plaza has two separate plaza spaces and approximately eight structures and was interconnected with the rest of the site's center via sacbe. No stone monuments have been recorded in the López Plaza. In contrast, the K'awiil Plaza lies less than 100 m west and contains several monumental constructions with associated stelae and an altar. The goals of test pit excavations were to refine the chronology of the López Plaza to better contextualize the activities of this plazuela group and integrate them into the broader history of El Palmar. Shovel test pit excavations and geophysical prospections were conducted to identify midden context(s) associated with everyday activities in the group's two plaza spaces. The intentions of the archaeological investigations conducted in 2022 were to begin to understand the activities of the López Plaza, the daily lives of those who participated in this space, and the group's interactions with other areas in the site center.

**Wegel, Lydia (Southern Illinois University, Edwardsville) and Corey Ragsdale (Southern Illinois University, Edwardsville)****[251]***Analysis of Entheses Development and Implications on Labor in Late Medieval Poland*

Studies of human behavior and habitual muscle use through analysis of entheses, or muscle insertion sites on the skeleton, continue to be an important way of examining labor among people in the past. In this study, we analyze entheses development on the skeletons of individuals from the recently discovered and excavated late medieval site of Gać in Greater Poland. We combine three commonly applied methods for studying entheses to account for different preferences. A sample of 44 adult individuals with estimated ages from approximately 20 to 50 years with complete or nearly complete arm and leg bones were examined in order to address the following questions: do entheses observed at Gać fit a labor model based on other similar studies in medieval Central Europe? Do entheses scores differ between males and females, supporting an observable division of labor? Do entheses scores correlate with age? Our results support evidence of intense activity related to labor throughout the sample, with few outliers. Interestingly, our results do not support a clear division of labor based on MSMs, and there is no correlation between age and degree of stress. Our preliminary findings are important in understanding the lifeways of people in late medieval Poland.

**Weiner, Robert (University of Colorado, Boulder)****[230]***Ritual Movement on Chacoan Roads: Insights from Recent Fieldwork, Ethnography, and Cross-Cultural Comparison*

This paper highlights some results of my four year fieldwork project to document monumental roads throughout the Greater Chaco Landscape and on Navajo Nation in particular. I place particular emphasis on the question of why and how people moved along Chacoan roads as a dimension of ritual practice. Using a combination of lidar, drone-based SfM photogrammetry, and traditional archaeological survey, my team and I discovered two previously unknown roads, three new herraduras (road shrines), and novel insights about the earlier dating of the South Road running from Chaco Canyon to Hosta Butte. One of the more intriguing findings was a set of parallel roads and associated small roadside architectural features near the Gasco Herradura that suggest some of the formalized prescriptions for ritual movement along Chacoan roads. I present an illustration of the movement patterns suggested by the Gasco Roads and interpret them within a larger discussion of processions, races, and ritual movement in the Chaco World.

Weiner, Robert [176] see Reese, Kelsey

**Weinmeister, Jessica (New Mexico State University)****[50]***Why So Blue? Color Symbolism in Ancestral Pueblo Lithics*

While both lithics and color have a long history in archaeological research, archaeologists rarely address the importance of color in lithic artifacts. The ethnography of the American Southwest indicates that both color and lithics can play a critical role in indigenous ritual and ceremony. To explore the relationship between lithic artifacts and color symbolism, I analyzed a sample of the lithic assemblage from the Crosspatch Site. The Crosspatch Site is a large Ancestral Pueblo community center and Chacoan outlier in Southwest Colorado that dates primarily from AD 800 to 1100. Thousands of chipped stone tools have been recovered from the site, making it an ideal candidate for lithic studies. Particular emphasis was given to the role of lithic raw materials and color in the site's lithic procurement patterns. To provide examples of lithics in ritual contexts, oral histories were collected from people who excavated the site. The data and ethnography indicate that blue-green is an important color to Pueblo people, including those who lived at Crosspatch. This research also indicates that in some cases, color has a relationship to the landscape and long-distance trade relations. These findings have implications for future research of color in relation to stone tools.

**Weismantel, Mary (Northwestern University)****[208]***Discussant***Weitzel, Elic (University of Connecticut)****[97]***Chair***Weitzel, Elic (University of Connecticut)****[97]***Commodification and Resource Depression of White-Tailed Deer in Seventeenth-Century New England*

While white-tailed deer were hunted by Native peoples in eastern North America for thousands of years, historical evidence suggests that deer populations declined dramatically following European colonization. Yet questions remain about the exact timing and causes of this decline. To address these questions, I analyzed zooarchaeological data from several sites in southern New England through the lens of behavioral ecology and with specific attention to information on deer age, body size, body part representation, and skeletal fragmentation. Results indicate that deer declined in abundance during the seventeenth century and that deer experienced both increased predation and decreased food availability at this time. Interestingly however, these changes occurred alongside large-scale demographic collapse of Native American populations and prior to the widespread influx of European settlers to the region. Deer population decline was therefore driven not exclusively by human demography, but by the cessation of anthropogenic niche construction as well as economic forces such as the commodification of deerskins and venison under capitalism.

**Welch, Jacob (Yale University)****[52]***Chair***Welch, Jacob (Yale University)****[52]***Birthing Dynasties and Raising Suns: Royal Women and Preclassic Maya Ritual*

Underneath a Classic Maya palace at Ucanha, builders buried a Terminal Preclassic platform outfitted with monumental portraits of rain gods. Analogous architecture appears throughout the Maya lowlands from the Middle Preclassic to Early Classic periods, and several scholars suggest their role in expediting the apotheosis of royal figures into solar entities. Building on the role these structures played in creating dynastic lines, this paper addresses the feminine nature of Maya masked architecture. I argue that their femininity begets consideration of royal women leading ceremonies atop these Preclassic monuments. The resulting implication contends that royal women not only played the important role in birthing future rulers but also made early contributions to the development of Maya religion.

**Welch, John (Simon Fraser University)****[4]***Discussant***Welch, John (Simon Fraser University), Emma Britton (Archaeology Southwest), April Oga (Archaeometry Lab at MURR), Brandi MacDonald (Archaeometry Lab at MURR) and Fred Nials (Archaeology Southwest)****[166]***Thriving under the Killick Critical Gaze (KCG): Toward Taphonomically Informed Forensic Sedimentology*

Archaeologists and Indigenous and national governments agree on the need to address the wicked problem of heritage resource crime, but archaeologists have yet to deploy the full range of analytic tools at our

disposal to assist in the investigation and prosecution of looting, vandalism, and grave robbing. “Dirt,” properly referenced as sediment, is tied to most archaeological resource crimes yet remains incompletely utilized in assessing links between crime scenes and looters, looting equipment, and looted objects. Our team is pursuing phased, context-sensitive binocular microscopy, trace-element analyses, petrography, and other analytic geoscience techniques. Results from initial applications of these techniques to sediment specimens from violated sites and background contexts on tribal trust (“reservation”) in Arizona are promising. Ever cognizant of the Killick Critical Gaze (KCG), and the Daubert standards courts use to assess scientific evidence, we are able to confirm that forensic sedimentology can provide courts with scientifically reliable, spatially scale-appropriate, taphonomically attuned, and juridically relevant attributions for sediment implicated in heritage resource crimes. Additional research is ongoing to refine divisions of labor and complementarity among analytic techniques, reduce the possibilities that specimens from different locations could produce analytically indistinguishable geochemical profiles, and improve the geographical precision of sediment source attributions.

**Welker, Martin (Arizona State Museum), Edward Jolie (Arizona State Museum), Sandra Koch (McCrone Associates Inc.) and Amanda Semanko (University of Arizona)**  
[245]

*Fiber Analysis of Dog Hair Textiles from the Prehispanic Southwest: Inferences Bearing on Yarn Production and Dog Breed Maintenance*

The domestic dog (*Canis familiaris*) was adapted to numerous roles in the past, including providing fiber for textile production. The coast Salish blankets of the Pacific Northwest are the best-known, and best-studied, examples, but dog hair textiles were also produced by indigenous groups in the Southwest, South America, and New Zealand. We examined several exceptionally well-preserved purported dog hair textiles from sites in Northern Arizona including Obelisk Cave and Broken Flute Cave to answer several questions. Our analysis confirmed the presence of both brown and white dog hairs. We also found that many hairs still have roots attached, suggesting dog hairs were collected through brushing or after having been shed. Finally, these textiles include a combination of dog and human hair, cotton fibers, and even feathers. These findings have important implications for our understanding of the role of dog hair as a fiber in the American Southwest. Dog hair appears to have been used in the prehispanic Southwest for a limited subset of clothing items, specifically sashes, belts, and garters, and may have been supplanted by cotton after about AD 1000.

Welker, Martin [48] see Semanko, Amanda

Welker, Martin [203] see Thomas, Ariane

**Wells, Joshua (Indiana University, South Bend), Mackenzie Edmonds (Indiana University South Bend), Eric Kansa (Open Context), Sarah Kansa (Alexandria Archive Institute) and David G. Anderson (University of Tennessee, Knoxville)**  
[124]

*Using Digitized Archaeological Literature as Big Data: Lessons from Using Open-Source Software to Text Mine Archaeological Site Numbers and Citation Information from JSTOR across the United States and Canada for the Digital Index of North American Archaeology (DINAA)*

The Digital Index of North American Archaeology (DINAA) now contains citations to professional journal articles which mention specific archaeological sites in tens of thousands of instances across the United States and Canada. DINAA researchers have developed methods to identify Smithsonian Trinomial (USA) and Borden Grid (Canada) archaeological site numbers published in over a dozen archaeological journals made digitally available through JSTOR. Through Open Context’s linked open data infrastructure, and DINAA’s use of site numbers as unique identifiers linked to spatiotemporal scientific and cultural data, the entirety of these publications are capable of being queried regarding concepts like cultural horizons, site types, diagnostic artifacts, or calendar year boundaries. Since 2021, JSTOR has provided the Constellate analytics service through which users may tailor Jupyter Notebooks for text mining. Instructions are provided regarding how these same methods may be used to identify structured site numbers in any digitized archaeological

publications, including journal articles beyond JSTOR, books, cultural resource management reports, and gray literature materials. These developments make indexing and connection of archaeological literature across the continent an immediately attainable possibility; strategies are suggested to help the archaeological community invest the needed ethical and practical efforts to ensure it is done appropriately and completely.

**Welsh, William (Virginia Museum of Natural History) and Hayden Bassett (Virginia Museum of Natural History)**

[72]

*The US Army's "Monuments Men and Women" in the Protection of Cultural Property during Natural Disaster*

In this poster, we outline the recent cultural property protection (CPP) work of the US Army's "Monuments Men and Women" (Military Governance Specialist 38G/6V) in response to natural disaster events. The poster will discuss the US Army's obligations under the 1954 Hague Convention for the Protection of Cultural Property in the Case of Armed Conflict, and other enabling treaties, policy, and doctrine, as a pathway to conduct cultural property protection as an element of US Army Disaster Response Operations. We will illustrate this humanitarian support function with recent case studies in which "Monuments Officers" have conducted this work in the US Southern Command (USSOUTHCOM), US Central Command (USCENTCOM), and US Africa Command (USAFRICOM). We conclude with the ongoing work of the US Army's "Monuments Men and Women," and the important role of cultural property protection (CPP) in a military context.

Welsh, William [30] see Bassett, Hayden

**Wendeborn, Drew (Maritime Archaeological Society)**

[35]

*Discovery and Survey of Seventeenth-Century Shipwreck Timbers Near Manzanita, Oregon*

In August of 2020, timbers believed to be part of the Spanish Manila galleon shipwreck of the *Santo Cristo de Burgos* were found in a sea cave on the coast of Oregon. The site is exposed only very briefly during extreme negative tides. Access to the sea cave is further complicated by an exposed hike along an eroding cliff face. Due to the ephemeral nature of the site, mapping of the timbers was undertaken in three separate expeditions using a tape, compass, and inclinometer. This research report details the initial site discovery, survey methodology, and timber distribution.

**Wendrich, Willeke (UCLA)**

[60]

*Chair*

**Wendrich, Willeke (UCLA)**

[60]

*Essential Contributions from African to Global Archaeology: Introduction*

Archaeology throughout the African continent in the last few decades has provided important insights into questions that are relevant to archaeology worldwide. Yet, these new theoretical perspectives and datasets have not been widely incorporated into scholarship elsewhere in the world, perhaps a latent effect of lingering colonialist perspectives, and consequently have not played prominently in global archaeological debates. This session aims to correct this situation by highlighting the ways that Africanist scholarship pushes forward debates on a variety of important topics, including but not limited to Indigenous archaeologies, domestication of plants and animals, egalitarianism and inequality, the practice of archaeology, complexity and urbanism, site formation processes, histories of technology, religion, and political process. This paper introduces scholars working in Africa and those working elsewhere to explore thematic and theoretical connections and identify new directions that emerge from these dialogues.

**Wendt, Carl (Cal State University, Fullerton) and Kenneth Peters (Stanford University)****[66]***Olmec Asphalt Trade Revealed by Combined Biomarker and Chemometric Analysis*

Within the Olmec region, resources such as basalt, asphalt, cacao, kaolin clay, and hematite pigment are available in discreet areas. This uneven distribution of raw materials has led some scholars to suggest that Olmec leaders controlled the sources of raw materials and regional trade, from which they derived their economic and political power. The purpose of this study is to improve our understanding of Olmec trade for asphalt, which was commonly used as a binder or sealant. Our novel approach combines molecular archaeology based on the geochemistry of biomarkers (biodegradation-resistant molecular fossils) with chemometrics (multivariate statistics) to identify genetic relationships among crude oils, oil seeps, and artifacts excavated from 10 Olmec sites. Seven source-related biomarker ratios based on peak heights from the terpane and sterane mass chromatograms were calculated. We employed HCA dendrograms, which yield a simple view of families of samples where cluster distance is a measure of the degree of similarity among samples. Our results illustrate the intra-regional movement of asphalt, shedding light on patterns of Olmec commodity exchange, intra-regional relationships, and interactions, providing little evidence for elite control of asphalt procurement or trade.

**Werens, Karolina (University of Oxford)****[53]***Chair***Werens, Karolina (University of Oxford), Rick Schulting (University of Oxford), John Pouncett (University of Oxford), Andrzej Weber (University of Alberta) and Christophe Snoeck (Maritime Cultures Research Institute)****[53]***A Multi-isotope Approach to Hunter-Gatherer Mobility and Microregional Connectivity in Middle Holocene Cis-Baikal, Southern Siberia*

Strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) and oxygen ( $\delta^{18}\text{O}$ ) isotopic variability in the environment is commonly used in archaeology to study provenance and mobility in the past. The interpretation of  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $\delta^{18}\text{O}$  isotopic values in humans, typically measured in dental enamel, relies on a comparison with the potential source, using local isotopic baselines based on empirical and/or modeled values. This study focuses on the Baikal Rift Zone to discuss the advantages and limitations of different approaches to spatial analysis of multi-isotopic data, including interpolation and machine learning. Characterized by distinct geology and biodiversity, the Lake Baikal region has a variable spatial distribution of isotopic abundances, which creates favorable conditions in which to apply isotopic mapping and probabilistic geographic assignments. The new isotopic baseline models for  $\delta^{18}\text{O}$  and bioavailable strontium ( $^{87}\text{Sr}/^{86}\text{Sr}$ ) were constructed using local plant ( $n = 355$ ), water ( $n = 70$ ), and human and faunal ( $n = 148$ ) samples. The archaeological populations studied were Early Bronze Age foragers (4970–3470 cal BP) with material culture and isotopic dietary evidence suggestive of regional-level interconnections. This study reports over 200 new human and faunal  $^{87}\text{Sr}/^{86}\text{Sr}$  and  $\delta^{18}\text{O}$  values, contextualized by producing quantitative geographic assignments to inform and cross-validate archaeological interpretations from the Lake Baikal region.

**Werness-Rude, Maline (Ventura College)****[133]***The Chocholá Style: Expanding the Corpus, Part 2*

Chocholá style ceramics were part of a Late Classic northern Maya complex of luxury goods that identified the social status and political affiliation of their owners. Vessels in the style are distinguished by their deeply carved iconographic panels, distinctive formatting, and unique dedicatory formulae. Their recognizability—a necessary component of the sociopolitical messaging in which these vessels played a role—is due in large part to these characteristic features. The conventions that guided the formation of this set demonstrate flexibility, however; Chocholá potters experimented with many variations to the core style even as more distantly

related outliers were also developed. It has been roughly 12 years since the most recent presentation of a Chocholá corpus and in that time new examples have come to light through publication and presentation in museum display. In a previous paper, I showed that this iconographic expansion of the corpus demonstrates further variety in image selection even as standard formatting approaches remain relatively constant. In this paper, I will review the new hieroglyphic inclusions found within the expanded corpus. These texts, like the image-based additions considered previously, increase awareness of the variability inherent in the style even as they solidify core attributes.

**Wernke, Steven (Vanderbilt University)**

[19]

*Discussant*

Wernke, Steven [189] see Turley, Samantha

Wernke, Steven [55] see Zimmer-Dauphinee, James

**Wescott, Konnie (Argonne National Laboratory), Jenn Abplanalp (Argonne National Laboratory), Lee Walston (Argonne National Laboratory), Emily Zvolanek (Argonne National Laboratory) and Conner Wiktorowicz (Argonne National Laboratory)**

[94]

*The Advantages of Landscape-Scale Cultural Assessments for Public Land Management*

In response to a recent shift toward a regional landscape-scale approach to resource management on public lands, Argonne National Laboratory in collaboration with multiple federal agencies developed a cultural heritage values and risk assessment strategy to support interagency land-use planning in the West. In contrast to project-by-project strategies, landscape approaches to managing America's public lands allow for a responsive posture that is capable of meeting challenges generated by environmental and social change. These assessments are designed to achieve three objectives: (1) document the most important and at-risk cultural resources that have shaped regional history, (2) evaluate cultural resource vulnerability to change agents over time (e.g., human development, climate change, wildfire, and invasive species), and (3) focus regional mitigation efforts on the most important and at-risk cultural resources. While individual cultural sites may have unique management requirements, comprehensive assessments of site relationships across the landscape afford better long-term planning and adaptive management across economic, administrative, and jurisdictional boundaries. The approach supports tailored, multiscale analysis strengthening collaboration across federal agencies, Tribes, the research community, and other stakeholders.

Wesp, Julie [124] see Scott, Jenna

Wessman, Anna [136] see Thomas, Suzie

West, G. James [127] see Johnson, John

Westaway, Michael [209] see Lowe, Kelsey

**Westendorff, Milsy (Northern Illinois University) and Dana Bardolph (Northern Illinois University)**

[103]

*Nuestras Voces: Representation and Visibility of Latinx Women Archaeologists in the United States*

In recent years, there has been an increase in social justice movements, from Black Lives Matter to #metoo. As Maria Franklin and colleagues have stated, when these movements took center stage in our nation, they forced us to reflect on our very discipline and the inequalities present within, which in turn has led to several

collaborations and research with marginalized communities. While important recent research has centered on the experiences of African American archaeologists, there is a lack of studies focusing on Latinx archaeologists, particularly women. People of color have all faced difficulties, but there are some experiences unique to particular groups. Such experiences shape the way we interpret and practice archaeology, thus contributing new perspectives and ways of thinking. Through interviews and surveys, this research project will bring attention to the experiences of Latinx women archaeologists based in the United States. Drawing from Black Feminist Theory, Gender Archaeology, and Critical Race Theory, this study will add to our collective understanding of the intersectionality of race and gender, how these experiences have shaped the way such scholars practice archaeology, the barriers still in place for Latinx women, and what we can do to foster a more inclusive and supportive environment.

**Westmont, V. Camille (University of the South)**

[217]

*Seeing Identity within a Carceral Environment: Race and Gender within sites of the Southern Convict Lease System*

Following the abolishment of chattel slavery in the United States, southern legislatures found a replacement for enslaved African American labor in their prison populations. Building on racist laws and racially prejudiced prosecutions, southern legislatures systematically charged, convicted, and then sold hundreds of thousands of prisoners to private industry. Tens of thousands perished under this system. In Tennessee, the vast majority of these prisoners were African Americans, although poor and politically unconnected white and Native American men were also ensnared in this unjust system. At the Lone Rock Stockade, the largest private prison stockade in Tennessee, archaeologists approach the difficult question of prisoner identities through an intersectional lens that understands race as one identity among a constellation of identities that fundamentally shaped prisoners' experiences of incarceration. In this paper, I will examine what an intersectional approach to "seeing" the African Diaspora through the material culture of incarceration adds to our understanding of the nuances and negotiations of power and identity in a powerless and anonymous place.

Westmont, V. Camille [16] see Klehm, Carla

Wheelbarger, Linda [45] see Rospopo, Steven

Wheeler, Charles [94] see Stoner, Edward

Whelpley, Jessica [71] see Pluta, Paul

Whelton, Helen [235] see Blong, John

**Whisenhunt, Mary (Center for Archaeological Research, UTSA) and Patricia Gilman (University of Oklahoma)**

[199]

*The Powers Ranch Site: Identity and Affiliation West of the Mimbres Heartland*

What does it mean to be Mimbres at the far edge of the Mimbres heartland? Here, we consider questions of Mimbres identity and affiliation by examining ceramics and architecture from the Powers Ranch site. We also analyze Powers Ranch in relation to other Mimbres Classic components along the Gila River to the south. The Powers Ranch project is virtually the only excavation of a Mimbres Classic site west of sites on the Gila River in New Mexico. Located on a high mesa on the Gila River in southeast Arizona, about 179 km west of the Mimbres Valley, it likely represents the far western edge of things Mimbres. Powers Ranch was professionally excavated in 1983, revealing two surface rooms, two smaller, contiguous exterior rooms, extramural activity areas, three or four pithouses, two burials, and a substantial ceramic assemblage of over 29,000 sherds. To analyze whether Powers Ranch was affiliated with the Mimbres heartland and/or the

Western Mimbres region in New Mexico, we compare designs and frequencies of the assemblage's Mimbres black-on-white sherds with pottery from sites in the Mimbres Valley. We also evaluate whether room block layouts and architectural materials are like those of the Mimbres and Gila Valleys.

Whisenhunt, Mary [198] see Freeman, Jacob

Whisenhunt, Mary [198] see Solis, Kristina

**White, Chantel (University of Pennsylvania), Carlotta Di Lallo (University of Ferrara), Laura Heale (University of Auckland), Sabrina Ross (University of Pennsylvania) and Nathan Arrington (Princeton University)**

[25]

*A Tale of Two Landscapes: Agricultural Evidence from a Classical/Hellenistic City and a Nearby Hellenistic Farmstead, Greece*

Archaeobotanical results from a coastal fourth-century BC city and from a second-century BC farmstead located 6 km away demonstrate two different agricultural strategies employed in coastal Thrace. While both sites show a reliance on cereals, the second-century farmstead also contains substantial evidence for the cultivation of bitter vetch, lentils, and chickpeas, as well as viticulture. The varied weed assemblages from these two sites suggest that crops were grown in two very different soil conditions. Weeds including dandelion and stinking chamomile signal that residents of the fourth-century city grew their crops on low-lying, clay-rich, poor soils. The weed assemblage from the farmstead, on the other hand, suggests access to fields located on higher-quality soils of the Thracian plain. This paper investigates the relationships between site location and field proximity, and we explore the potential reasons why less-than-ideal soils may have been heavily cultivated by farmers associated with the fourth-century city.

White, Chantel [114] see Miller, Naomi

White, Chantel [211] see Moore, Katherine

**White, John (Texas A&M University), Auréade Henry (Université Côte d'Azur, CNRS), Stephen Kuehn (Concord University), Michael Loso (Wrangell-Saint Elias National Park and Preserve) and Jeffrey Rasic (National Park Service)**

[15]

*Terminal Pleistocene Human Occupations in the North Pacific Basin of Alaska: Results and Implications of Test Excavation at Nataeł Na'*

Nataeł Na' is an ancient buried multicomponent site located in the northern Copper River Basin. During the 2017–2018 field seasons NPS Archaeologist Lee Reininghaus led test excavations at Nataeł Na' revealing a combustion feature dating to ~12,200–11,400 cal BP. In 2019 a team from the Center for the Study of the First Americans at Texas A&M University conducted expanded test excavations to gain a better understanding of the site. We excavated 4.75 m<sup>2</sup>, stratigraphically identifying multiple cultural components. Here we present the results of our analyses, reporting additional radiocarbon ages, details on site-formation processes, and lithic-technological activities carried out during the ~12,000 cal BP occupation. Moreover, we present an earlier, though presently ephemeral, cultural component dating to the Allerød interstadial, the earliest evidence of humans south of the Alaska Range in the Pacific basin. This site is located in close proximity to the reconstructed shores of Glacial Lake Ahtna. Data from this site may elucidate the strategies and settlement patterns employed by ancient human populations during the initial peopling of Alaska, and more broadly of the Americas. We present these results hoping to contribute to the ongoing debate seeking to expand our understanding the earliest inhabitants of the Americas.

**White, William (University of California, Berkeley)**

[4]

*Discussant*

**Whitehead, William (SWCA Environmental Consultants), Curtis Edson (United States Air Force Academy) and David Prall (SWCA Environmental Consultants)****[44]***Digital Conservation Efforts at Cathedral Rock, United States Air Force Academy*

Cathedral Rock, on the United States Air Force Academy (USAFA) is a valued historic locus, with many shareholder communities interested in its continued preservation and protection. As part of a larger cultural resource survey effort on the base, SWCA Environmental Consultants, Sundance Consulting, and the USAFA has teamed together to produce a digital reconstruction of the Cathedral Rock, with several collection techniques and scales in the interest of historical preservation and change detection. We have reconnaissance from satellite imagery, aerial photography, sUAS flights, terrestrial photography survey, and ground based lidar. The data has been collected at several different time points making reconciliation a technical hurdle to overcome. This poster will present the results of these survey efforts, evaluate the techniques individually and together, and give recommendations for future work. As part of the poster presentation, a virtual presentation with the 3D models on a local PC will also be available for review.

**Whitley, David****[241]***The Many Meanings and Uses of Tomo-Kahni Rock Art*

Certain current rock art debates involve methodological rather than empirical issues (as incorrectly but commonly assumed), reflecting researchers' unfamiliarity with principles of symbolic analysis and the resulting functions and meanings of rock art sites. One key error concerns the fact that symbols are polysemous and always have multiple meanings. Another involves the distinction between the origin and initial purpose/meaning of the art versus subsequent secondary uses and meanings. Confusion on these symbolic characteristics and distinctions has been especially prominent in debates about shamanic rock art. The century-long ethnographic record for site CA-KER-508 ("Creation Cave" or "Teddy Bear Cave") in Tomo-Kahni State Park, CA, illustrates the importance of recognizing how rock art sites were first made and then used by non-painters and thus the multiple meanings they embodied and purposes they served.

**Whitley, Thomas (Sonoma State University)****[117]***Adapting to the Changing Environment in CRM Graduate Training*

Graduate training in cultural resources and heritage management has evolved in the last few decades, from a focus almost exclusively on compliance archaeology, to one where descendant community outcomes and involvement take center stage. It also entails working with new, and often changing, legislation that can seem to conflict with typical processual objectives that were the bread-and-butter of CRM graduate training not that long ago. At Sonoma State University, with one of the longest-lived CRM MA programs in the nation, we are incorporating new perspectives, expanding the nature of student experiences, and trying to forecast where our alumni are going to be in the coming decades. It doesn't necessarily imply discarding a compliance-based approach, but it means rethinking CRM as a discipline and who the beneficiaries of it need to be. It means working cooperatively with descendant communities to not only safeguard their heritage, on their terms, but to encourage cross-disciplinary interaction and develop outcomes that provide new ways, not only of thinking about the past but of planning for the future.

**Whitlock, Bethany (Brown University)****[233]***High-Altitude Andean Wetlands: Classificatory Systems, Nomenclature, and Functional Implications*

High-altitude wetlands, known as bofedales, are vital resources for Andean herding communities because of the high-quality, perennial vegetation they provide. These wetlands are often peat-accumulating, and are attracting renewed attention because of their roles in carbon sequestration and water regulation. Archaeological and ethnographic research has documented how herders have long worked to improve bofedales through the construction of features such as silt dams and canals. While "bofedal" is usually used as a universal term to

describe high-altitude Andean wetlands, recent Western scientific classifications describe multiple wetland categories based on soil saturation, geochemistry, and vegetation communities. These classifications have functional implications regarding grazeland management and the (un)acknowledged role of herders in wetland maintenance, yet often minimize the lived experience of bofedales in favor of biophysical factors. Drawing on environmental and archival data from Huancavelica, Peru, I present a preliminary consideration of the intersections and discrepancies between different wetland classification systems and nomenclature, with a focus on their underlying motivations and meaningfulness in terms of how people use the land they describe. Understanding this is a critical step in ensuring the sustainability of wetland socioecosystems in a context of heightened vulnerability due to environmental change, migration, and extractive pressure.

**Whitridge, Peter (Memorial University of Newfoundland)**

[92]

*Precontact Inuit Watercraft and the Hunter-Prey Actantial Hinge*

Maritime harvesting from watercraft and sea ice was the foundation of precontact Inuit economy throughout the Eastern Arctic, and small watercraft also figured in locally important terrestrial caribou hunts. Boats were everywhere essential to work, travel, and trade during the open water season. Although the body of ancient figurative art depicting boating is slim, a number of representations exist of crewed umiaks (*umiak*) and kayaks (*qajaj*) employed on the water in the course of harvesting bowhead whales and caribou. This represents a significant condensation of the actual breadth of activities surrounding boat use, which included collecting driftwood for the frame, procuring and processing hides for boat covers, manufacturing and covering the frame, producing hunting equipment, engaging in social and ritual activities attendant on cooperative hunting, logistically mounting and prosecuting the harvest, processing and transporting game, distributing resultant animal products within the community, voyaging to seasonal trade fairs, and moving camp. Rather than a “flat” actor-network of equally meaningful nodes and linkages, precontact Inuit depicted, and presumably imagined, the extraordinarily complex entailments of watercraft use in terms of a singularly meaningful actantial hinge—boat-borne hunters encountering swimming prey—implying an ontology premised on this repeated moment of encounter.

**Whittemore, Anna (Cornell University)**

[217]

*Settled in Strange Lands: Forced Relocation as a Technology of the Inka Empire*

Why do empires force their subjects to leave home? From Neo-Assyria to the British West Indies, coercive migration policies have been adopted by expansive, multiethnic polities across time and space. One of the most ambitious projects of imperial forced relocation took place in the Inka Empire through their policy of *mitmaq*. This policy is widely recognized as a lynchpin of Inka statecraft, yet only rarely interrogated or contextualized. In part, this is due to the high burden of proof required to detect the *mitmaq* archaeologically. In isolation, archaeological indicators of migration, such as ceramic typologies and isotope geochemistry, cannot distinguish *mitmaq* from other forms of mobility. In order to delve deeper, I engage in a comparative study of imperial forced resettlement. Then, I present preliminary archaeological findings from the Rio Qaracha Basin (Peru), where the *mitmaq* is documented historically, but, to date, has not been addressed through archaeology. I argue that, when informed by global examples of imperial forced relocation, the settlement pattern and osteological indicators not only reflect the *mitmaq*, but hint at details unknown through written records. Finally, I outline how a cross-cultural perspective on empire will direct a fine-grained study of one community’s life under the *mitmaq*.

**Whittington, Stephen (Retired), Robert Tykot (University of South Florida), Karyn Olsen (University of Western Ontario) and Fred Longstaffe (University of Western Ontario)**

[125]

*Analysis of Human Skeletal Remains from Late Postclassic Iximché, Guatemala*

Analysis of human skeletal remains from the Postclassic Kaqchikel Maya capital of Iximché, Guatemala, supports the interpretation that many of the partial skeletal remains were trophies taken in war or were

from war captives sacrificed at the site. Other, more complete, remains generally represented local residents who died of causes unrelated to war. Extensive data on paleopathology, paleodemography, and stable isotopes were included in a 2003 book that built on George Guillemin's earlier publications about his excavations at the site. This poster will present previously unpublished data about additional stable isotopes and perimortem bone damage to explore regional variations in diet, ethnic identities of victims of violence buried at Iximché, and the pattern of highland Maya warfare on the eve of the Spanish conquest. Photographs of human remains will be minimized but may be necessary to support conclusions. Please note that the original analyses took place during the 1990s, long before the 2021 SAA Statement Concerning the Treatment of Human Remains. The research was performed ethically and with permission of Guatemalan authorities, but did not involve consultation with indigenous descendant communities, which was not an expectation at that time or in that place.

Whittington, Stephen [91] see Frykholm, Soren

**Wholey, Heather (West Chester University)**

[1]

*Moderator*

[1]

*Discussant*

**Wichlacz, Caitlin (Arizona State University)**

[199]

*Reassembling Salado: Salado Polychrome Ceramics in the Phoenix Basin*

This poster presents the results of dissertation research examining manifestations of the Salado phenomenon at Hohokam sites in the Phoenix basin of Arizona, investigating how Salado polychrome (Roosevelt Red ware) ceramics were incorporated into contemporaneous Hohokam ceramic assemblages and practices during the late Classic period. A suite of complementary analyses including neutron activation analysis (INAA), electron probe microanalysis (EPMA), and petrography are used to evaluate the production and technology of Salado Polychrome pottery in the Phoenix basin, and geometric morphometric analyses using Elliptical Fourier Analysis (EFA) of whole vessel profile shapes is used to examine the morphological organization of Phoenix basin Hohokam ceramic assemblages and the relations of Salado polychrome ceramics within these broader ceramic assemblages.

**Widga, Chris (Gray Fossil Site & Museum), Darian Bouvier (East Tennessee State University), Lawrence Todd (Greybull River Sustainable Landscape Ecology Project), Amy Phillips (Draper Museum of Natural History) and Kenneth Cannon (Cannon Heritage Consultants)**

[170]

*High-Elevation Bison in the Rocky Mountain Front Range during the Late Holocene*

During the late Holocene, large bison herds occurred in grass-dominated ecological zones across much of the North American mid-continent. However, in situ fossils and historic accounts illustrate the adaptability of bison to a broad ecological niche space, from grassy prairies and plains to eastern forests. Yet, there are few bison found at high elevations. This research, spurred by the discovery of bison remains at >3,000 m in the front range of the Rocky Mountains, explores how bison used these landscapes through the lens of horn (keratin), bone, and tooth (enamel) stable isotope systems (C, N, O, Sr). Bison horn keratin was sampled in seven late Holocene bison for  $\delta^{13}\text{C}$ ,  $\delta^{15}\text{N}$ , and  $\delta^{18}\text{O}$  to understand life history trends. Oxygen isotopes exhibit up to 8‰ periodicity. Changes in  $\delta^{15}\text{N}$ , occasionally in concert with  $\delta^{18}\text{O}$  from the same samples, are interpreted to represent movement from lower-elevation grassland environments (high microbial activity) to high-elevation ridgelines with herbaceous vegetation (low microbial activity). Results of serial tooth enamel samples ( $\delta^{13}\text{C}$ ,  $\delta^{18}\text{O}$ , and  $^{87}\text{Sr}/^{86}\text{Sr}$ ) from seven nearby bison molars also reflect diet and mobility patterns. Enamel  $^{87}\text{Sr}/^{86}\text{Sr}$  suggests four of these acquired forage >10 km from the location where they were recovered.

Widga, Chris [62] see Boehm, Andrew

Widga, Chris [203] see Thomas, Ariane

**Wieckowski, Wieslaw (University of Warsaw)**

**[139]**

*Elites, Craftsmen, or . . . Commoners? Ten Years of Bioarchaeological Research at Castillo de Huarmey*

In the last 10 years, the multidisciplinary Polish-Peruvian archaeological project at Castillo de Huarmey brought to light numerous finds. Some of the most significant research consists of wide-scale bioarchaeological analyses of human and animal remains originating from both undisturbed and looted burials. The most important contexts include the first ever discovered undisturbed tomb of female members of the Wari elites, burials of various highly skilled and elite specialists in different crafts, and more. The results clearly and unequivocally point toward the unique character of this Middle Horizon site associated with the Wari presence in the region.

**Wienhold, Michelle (Applied EarthWorks Inc.) and Kelli Wathen (Applied Earthworks Inc.)**

**[75]**

*Digitizing, Automation, and Archaeology: Creating Efficient Workflows*

The work of cultural resource management (CRM) requires methodical data collection, transcription, and dissemination of cultural resources. For much of the history of CRM, data collection methods have been purely analog, using paper forms and drawing maps resulting in an abundance of data that must be transcribed and digitized, taking extra time, money and allowing the introduction of errors. Applied EarthWorks has begun digitizing all aspects of fieldwork data recordation by utilizing a suite of products including tablets, GNSS receivers, ESRI applications, and automation software. Data are collected in the field using Survey123 or Field Maps, and the resulting data are tabulated in spreadsheets, filed on the server, emailed using Make automation software, and displayed for project managers using Dashboards. Database management no longer requires paper documentation and there is no need to transcribe data, creating an efficient process that reduces errors. Additionally, data collection using cloud storage and automation software allows for the use and dissemination of data in real time across the organization. The streamlined delivery of data has resulted in budget savings by reducing transcription errors, flexible formatting to suit the needs of our clients and reports and visualizing field data collection through dashboards for project management.

Wienhold, Michelle [74] see Wathen, Kelli

Wikberg, Eva [124] see Hard, Robert

Wiktorowicz, Conner [94] see Wescott, Konnie

**Wilcox, Michael (Stanford University)**

**[39]**

*Discussant*

Wilkes, Margaret [167] see Lowe, Lexie

Wilkes Gray, Debra [243] see Batty, Sylvia

**Wilkinson, Darryl (Dartmouth College)****[24]***Hillfort Horizons: Rethinking Violence and Egalitarianism during the Andean Late Intermediate Period*

In the Central Andes, the era immediately prior to the consolidation of the Inca Empire is known as the Late Intermediate period (LIP, ca. AD 1000–1450), traditionally seen as a “stateless” time between episodes of political centralization. Both Inca and Spanish accounts from the early colonial period cast it in a very negative light; a time beset by chaos, violence, and barbarism. Obviously, such sources must be read in a propagandistic light, seeking to justify both Inca and Spanish imperialism by presenting them as agents of “order” and good government. And yet, the archaeological record for the Late Intermediate period does not permit us to entirely dismiss these accounts, at least with respect to their claims about incessant conflict. One of the more distinctive features of the LIP was an unprecedented and widespread proliferation of hillforts, typically interpreted as reflecting an increase in petty warfare and associated political “balkanization.” In this paper, I ask: What kind of social order actually underlay the hillfort horizon of the LIP? In particular, I will explore the archaeological evidence that suggests a link between militarism and the emergence of surprisingly egalitarian LIP polities, some of which might even warrant the label “urban.”

Wilkinson, Keith [56] see Adler, Daniel

Wilkinson, Keith [56] see Gasparian, Boris

Wilkinson, Keith [56] see Gill, Jayson

Wilkinson, Keith [56] see Sherriff, Jenni

**Wilks, Stefania (University of Utah) and Lisbeth Louderback (University of Utah)****[130]***Geophyte Exploitation in Northern Great Basin: Starch Granule Analysis of Bedrock Metates in Warner Valley, Oregon*

Geophytes store starch in underground organs considered highly valued food resources across many human societies. For example, Indigenous people in the northern Great Basin plan social activities around the seasonal foraging of bulbs, roots, and tubers. Despite such obvious dietary importance, however, the antiquity of geophyte use in the Great Basin remains difficult to establish. The soft tissues of herbaceous underground storage organs do not preserve in the archaeological record. Therefore, most studies rely on indirect evidence to infer geophyte consumption by hunter-gatherers during the late Pleistocene/early Holocene, particularly in the northern Great Basin. Furthermore, researchers suggest that repatinated bedrock metates (i.e., milling features on bedrock exposures), commonly found among upland archaeological sites, reflect long-standing use for seasonal plant gathering and processing over the last 12,000 years. Our study tests this hypothesis by analyzing starch residue extracted from bedrock metates with varying degrees of repatination at three archaeological sites in the uplands of Warner Valley, Oregon. Starch granules from geophytes, specifically *Lomatium* spp., were identified on metate surfaces at all three sites, thereby providing direct evidence for the collection and processing of geophytes. These results support previous hypotheses regarding the seasonal foraging of geophytes by Paleoindians in the Great Basin.

Will, Manuel [212] see Conard, Nicholas

Willerslev, Eske [53] see Macleod, Ruairidh

Willerslev, Eske [53] see Wang, Yucheng

Williams, Ashley Megan [172] see Paris, Elizabeth

**Williams, Charlotte****[132]***Containing Archaeology: Categorization, Hidden Labor, and the Social Lives of Archaeological Ephemera*

In 1940, textile fragments and botanical specimens were packed into matchboxes from cave sites in Coahuila, Mexico during Walter Taylor's archaeological excavation. By the 1990s the specimens were accessioned into the Smithsonian, and the archaeological notes archived, yet the matchboxes themselves never received any record. Instead, collections managers taken by the artwork and the novelty of the containers saved them as ephemera. This project treats these matchboxes as artifacts of archaeological work, and indeed as entities that were influenced by and capable of making practices of archaeological science. By tracing the labor regimes they passed through, the specimens they once contained, and the hands that used them in a multitude of ways, this project uses the matchboxes' microhistories to ask questions about how archaeological narratives get constructed, in what conditions, and by whom.

Williams, Jeremy [88] see Gala, Nicholas

Williams, Lana [43] see Batres, Kimberly

**Williams, Nala****[131]***"To Have Expertise Be Recognized": Black Women Archaeologists, Obligation, and Archaeological Expertise*

Following the murder of George Floyd in 2020, archaeological organizations and universities organized panels to address anti-Black racism in archaeology. These talks and panels relied on Black women's sense of obligation to better not only the field of archaeology but the climate for Black people in the United States as a whole. Rather than these institutions calling upon their expertise as both archaeologists and Black women, these organizations invited Black women to speak solely about anti-Black racism, denying them a venue to demonstrate expertise on their archaeological research. Obligation informs much of the academic labor Black women undertake in their institutions, field sites, and relationships with other Black women. These acts of care circulate, support, and strengthen the community of Black women in archaeology and aid in developing their professional identities. Through ethnographic research, this paper explores how institutions leverage Black women's sense of obligation and ethics of care to devalue and tokenize Black women's archaeological expertise.

**Williams, Patrick Ryan (Chicago Field Museum)****[22]***The Religious Nature of Defended Sites: Chip's insights at Cerro Baul*

Chip has always been a big thinker about the capacity for violence in the human species and has pioneered ways of thinking about warfare in the Andean past that has revolutionized the field. He has also explored the roles of ritual and symbolism in his more recent work and his insights have influenced the ways the current generation of scholars is contemplating the roles of ritual, religion, and warfare in our world. I explore here the intersection of these phenomena at Cerro Baul, the Wari center on the Tiwanaku frontier, following on Chip's advice three decades ago about how to think about this problem. Our excavations in the past few years have yielded new evidence on the nature of religious syncretism on the defended mountaintop citadel that suggests the ways in which religion and ritual intersect with warfare and defended settlements in the Andean Middle Horizon. We explore especially how a Tiwanaku temple was established within the Wari fortress and reflect on the recent evidence for how that temple was provisioned with ritual ceramics, obsidian, and exotic offerings. In so doing, we examine the nature of ritual in defended sites in the Andean world.

Williams, Patrick Ryan [162] see Slovak, Nicole

Williams, Philip [181] see Moriarty, Matthew

**Williams, Scott (Washington State Department of Transportation)**

[35]

*Chair*

**Williams, Scott (Washington State Department of Transportation)**

[35]

*Analysis of Recovered Hull Elements from the Manila Galleon Santo Cristo de Burgos of 1693*

During the summer of 2022 wood beams were recovered from the wreck of the Manilla galleon *Santo Cristo de Burgos*, which wrecked on the north Oregon coast in 1693. This paper presents analysis of those beams and other artifacts from the wreck, including species identification and radiocarbon dating.

Williams, Sloan [244] see Brunson, Katherine

**Williams-Beck, Lorraine (Universidad Autonoma de Campeche)**

[133]

*Material Signatures for Idolatry in Sixteenth- to Eighteenth-Century Viceregal Yucatan*

Rampant idolatry and Mayan resistance to the religious conquest, narrated in Early Viceregal Yucatan documents, bespeaks an underlying visual component for continuing traditional religious practices. Franciscan rural chapels, churches, and convents interior mural paintings and architectural facade sculptural details provide the material signatures to unlock Native cosmological permanence. This paper addresses some key themes discovered in nearby Spanish urban centers, Spanish administrative municipal and religious doctrine seats, and distant rural enclaves in sixteenth- to eighteenth-century Indigenous communities throughout the Yucatan Peninsula. Most examples date to Early Postclassic architectural, sculptural, and painted imagery, later reiterated in codices and creation myths narrated in ethnohistorical sources to provide fertile avenues within which to identify continuing precolumbian cosmic symbolism that adorns Franciscan built landscapes in congregated urban neighborhoods and rural towns all erected by Mayan natives.

**Williamson, Ronald (Archaeological Services Inc.) and Jennifer Birch**

[24]

*Northern Iroquoian Conflict: From Coercive Adoption to Community Destruction in a Matter of Decades*

Although the cause of the enmity between the Huron-Wendat and the Haudenosaunee is unknown, it commenced in the late 1400s and intensified in the early to mid-1500s, impacting the north shore of Lake Ontario, eastern Ontario, the Ottawa Valley, and central New York. This is demonstrated by exceptional quantities of scattered and culturally modified human bone on Northern Iroquoian sites of that period. Hostilities escalated throughout the early to mid-1600s, as Europeans and Indigenous groups were all drawn into a complex geopolitical and economic web fuelled by competition for the trade in beaver pelts. What started as feuding characterized by revenge and adoption had, by Champlain's era, turned into massive, coordinated parties of 1,000 warriors at a time, organized by nation but often carried out at a confederacy level. With time this cycle of violence became more intense and involved clear economic motives, such as attacks on fur brigades. In the 1640s, this violence culminates with the full-scale removal of competitors from the region by the Haudenosaunee. Herein, we examine organizational transformations in Huron-Wendat and Haudenosaunee conflict, the factors that resulted in Haudenosaunee military ascendancy, and the impact and legacy of these processes on early colonial North America.

Willis, Frank [63] see Halling, Christine

**Wilshusen, Richard (Crow Canyon Archaeological Center), Kellam Throgmorton (Crow Canyon Archaeological Center) and Grant Coffey (Crow Canyon Archaeological Center)**  
[90]

*Bridging the Long Tenth Century: From Villages to Great Houses in the Central Mesa Verde Region*

Research by the Crow Canyon Archaeological Center and affiliates has illuminated many periods of history in the central Mesa Verde region; it has also highlighted several lacunae. The Long Tenth Century (AD 890–1030) is one of these lacunae. There is a conspicuous gap in the dendrochronological record, and sites are few and far between. In addition, the Long Tenth Century falls between two of the major research themes in the central Mesa Verde region—the development of the first village societies in the Pueblo I period (AD 760–880) and the Chacoan florescence in the late Pueblo II period (AD 1075–1140). To better understand this period, we summarize what we currently know about environmental change, settlement patterns, and architecture in the central Mesa Verde region. We consider the social and demographic consequences of village collapse and how these influenced the development of cultural landscapes in the region. Then, using newly synthesized excavation data, we address the origins of great houses in the Mesa Verde region and their relationship to Chacoan great houses in the San Juan basin. Far from a lacuna, the Long Tenth Century appears to have been a period of significant change linking villages and great houses.

**Wilson, Douglas (Portland State University; National Park Service)**  
[98]

*Decolonizing the Fort Vancouver School*

The Fort Vancouver School formed part of the colonial project of the Hudson's Bay Company to "civilize" and assimilate Native Americans and the multiethnic families of fur traders. By 1836, a kitchen behind the Chaplain's/Priest's House was used as the schoolhouse. By 1844, the schoolhouse also hosted the "Owyhee Church" to monitor and assimilate Native Hawaiian workers. The site was first excavated by Louis Caywood between 1948 and 1952. A 2022 public archaeology field school returned to this site to relocate the test excavations and to collect a sample of belongings from the intact floor. Slate pencil and tablet fragments were recovered with other objects that spoke to the mixed function of the building and the various ways in which students were socialized to the British hierarchical system. The site is keenly tied to the colonial mission to indoctrinate its students in "civilizing" pursuits including the dominance of the English language, Christianity, and Western-style agriculture. The school also provided necessary information to adapt to the rapidly changing social and political conditions of the Pacific Northwest in the 1830s through 1850s. The presence of Indigenous items hint at the complexity and persistence of native traditions in the face of colonialism.

**Wilson, Douglas (Portland State University; National Park Service)**  
[98]

*Chair*

Wilson, Douglas [6] see Cromwell, Robert

Wilson, Douglas [182] see Wynia, Katie

Wilson, Greg [94] see Oppenheimer, Jonas

Wilson, Gregory [217] see Bardolph, Dana

Wilson, Gregory [213] see Ferree, Tyler

Wilson, Gregory [218] see Noe, Sarah

Wilson, Jeff [101] see Elvidge, Michael

**Wilson, Jeremy (Indiana University-Purdue University, Indianapolis), Grace Bocko (University of Indianapolis) and Olivia Messenger (University of Indianapolis)****[104]***“Getting Long in the Tooth” at the Bethel Cemetery: A Paleoepidemiological Analysis of Dental Disease*

Building on our prior paleodemographic research as part of the Bethel Cemetery Relocation Project, this study examines the patterns of dental disease and rates of decayed, missing, and filled teeth (DMFT) across the three periods of interment and between biological sexes. Contrary to what might be predicted, given documented improvements in oral health care and intervention during the nineteenth and early twentieth centuries, the percentages of carious teeth, tooth loss, and DMFT increase over time. We attribute these to a shifting demographic regime and overall increase in life expectancy that facilitated more insults among an aging population. For biological females, tooth loss and DMFT significantly increase over time, while the percentage of carious teeth is significantly different between young, reproductive-age females and middle-to-older ones. These findings suggest that survival into older adulthood for biological females may have been predicated on fewer incidences of dental disease. Our findings also highlight that the frequency of skeletal and dental lesions cannot be necessarily equated with improvements or declines in overall health. The changing demographic composition of the Bethel Cemetery drove dental disease patterns for both sexes, who generally lived longer and accumulated more dental insults.

Wilson, Jeremy [45] see Polk, Sara

Wilson, Jeremy [104] see Powell, Alexandra

**Wilson, Katherine (Shumla Archaeological Research & Education Center) and Victoria Roberts (Texas State University)****[181]***Public Outreach and Rock Art: Shumla Archaeological Research & Education Center’s Commitment to Public Engagement*

Public outreach is a fundamental part of our mission, and as such, Shumla Archaeological Research & Education Center has adopted a variety of methods for public outreach. (1) For landowners and site stewards, we produce short reports containing photographs, maps, and hyperlinks to 3D models and Gigapans that summarize and illustrate our observations, providing tangible documents to view and share with family members and visitors. (2) We utilize multiple social media platforms, each filling a different niche for sharing information. E-newsletters and blogs allow for more detailed reporting on various aspects of our organization while Facebook and Instagram have become our day-to-day platforms to share quick project updates, along with recurring tagged posts. (3) In 2021, we began Shumla Treks, a program designed to bring the public to rock art sites in the Lower Pecos; participants hike to sites with a Shumla archaeologist to learn about the region’s cultural resources and Shumla’s current research. Through our outreach programs, we are realizing our vision of having an educated public engaged in promoting the significance, preservation, and study of Lower Pecos rock art.

**Wilson, Kurt (University of Utah), Kasey Cole (University of Utah) and Brian Coddling (University of Utah)****[97]***Modeling Key Socioecological Factors Influencing the Expression of Egalitarianism and Inequality among Foragers*

Understanding what favors egalitarian versus non-egalitarian resource access and patterns of behavior is a long-standing topic of interest, with much research narrowing in on potential social and environmental causes. Past modeling exercises have implemented game theoretic and simulation approaches to explore social patterns that may underlay inequality’s emergence with past theory work emphasizing how subsistence resource characteristics also have an impact. Here we build on these past works and implement a theoretically informed agent-based model to explore the scope of impact the economy of scale, abundance, predictability, and heterogeneity in distribution of subsistence resources may have on altering the probability of foragers experiencing inequality. When matched with ethnographic and archaeological cases of foraging

societies with inequality, our results point to key interactions between resource characteristics that suggest explanations for both the general pattern of egalitarianism among foragers and the rarer instances of unequal foragers. Particular key results support prior work emphasizing the effect heterogeneity in resource distribution and predictability of resources have for incentivizing inequality even when the cost to defend a resource is high. This preliminary model further provides an extendable baseline for future simulation work and pattern matching with ethnographic and archaeological data.

Wilson, Laura [228] see Rangel de Lázaro, Gizeh

Wilson, Michael [88] see Gala, Nicholas

### **Winchell, Frank**

**[20]**

*The Location for the Origin of Domesticated Sorghum in Africa: A Brief Review of Some Cultures in the Sahara, Nile, and Sahel*

Recent analyses have established the location for the origin of domesticated sorghum occurring in the far eastern Sahel of Sudan during the fourth millennium BC associated with the Late Neolithic Butana Group. For over a half century, sorghum domestication has been hypothesized as occurring somewhere in the Sahelian region, where it was finally discovered. However, questions remain as to why other earlier cultures in the Sahara, as well other early and contemporary ceramic-bearing cultures along the Nile Valley, all of which had access to wild stands of sorghum, did not initially domesticate it as happened with the Butana Group farther to the east. This paper will review particular cultures in these regions, their economic and cultural characteristics, and attempt to explain why the Butana Group was first to engage in the process of sorghum domestication in the far-eastern Sahel of Sudan.

### **Windes, Thomas (University of New Mexico) and Benjamin Bellowado (Crow Canyon Archaeological Center)**

**[90]**

*Revisiting the Depopulation of the Northern Southwest with Dendrochronology: A Changing Perspective with New Dates from Cedar Mesa*

The depopulation of ancestral Pueblo people from the northern Southwest has been a fascination of archaeologists for decades. Using a suite of social and environmental models, scholars have attempted to explain the processes that led tens of thousands of people to vacate hundreds of communities at the end of the thirteenth century AD. Recent site documentation and dendroarchaeological research in the Cedar Mesa area, however, shows an inherent bias in these assessments that undervalue the size of populations and their longevity on the outskirts of the region. We provide a synthesis of new tree-ring data from over two dozen previously unrecorded cliff dwellings from the greater Cedar Mesa that provide insights into the dating of construction and remodeling of structures and the size and longevity of communities living in remote cliff-dwellings in the western portion of the region. In this presentation, we review previous discussions about the timing of the depopulation of the northern Southwest, from the point of view of the Cedar Mesa area, to reassess the nature and timing of the depopulation and the effect these data have on assessments of the depopulation of the larger region.

### **Windle, Morgan (ROOTS Cluster of Excellence, Kiel University)**

**[23]**

*Exploring (In)Visible Impacts of Multispecies Living among Hunter-Fisher-Herders in Boreal North Asia*

*Rangifer tarandus* (reindeer and caribou) are a keystone species that have shaped the complex fabric of mobile hunter-fisher societies in North Asia, not only as herded animals and wild game but as animate persons. In

western Siberia and northern Mongolia, descendant hunter-fisher-herders co-create entwined multispecies cultures through symbiotic relationships with their fellow nonhuman inhabitants of the taiga biome. Recent archaeological research among Sel'kup and Dukkha communities provided a unique opportunity to witness firsthand the, often paradoxical, capacity for nonhumans to shape lifeways. Enduring traditional practices in these regions provide insight into the observable impacts of animate multispecies communities and their visibility (or lack thereof) in the archaeological record. Using pathology, stable isotope analysis, and ethnography from these modern descendant communities, this paper will analyze and compare the dynamic and enmeshed constellation of livelihoods observed in boreal northwest Siberia and northern Mongolia. Initial dietary and activity reconstructions of traditionally herded reindeer indicate potential avenues for insight into how the more-than-human world can impact hunter-fisher lifeways and trigger unique niche construction activities. In doing so, the traceability of these phenomena will be tested and parameters for identifying herded reindeer in the archaeological record of North Asia are explored.

**Winnicki, Liv (Binghamton University)**

[28]

*In the Groove: Alternative Functions for Sharpening Grooves in the Pueblo Southwest*

Commonly across the Puebloan Southwest, incised lines are observed adjacent to petroglyph panels. Often, these features are simply labeled as “axe sharpening grooves.” Many archaeologists label them in their site forms as such, tally them, and tend to not interpret them further. In this experimental research, I push back on this over simplified interpretation of these grooves. By conducting an experiment with what types of materials could create these grooves, the extent in which they sharpen axes, and if the depth is suitable for sharpening through refitting, I infer that these are not simply sharpening grooves. Further, I connect the location and context of concentrations of grooves at specific sites at Chaco Canyon, Lightning Tree House in SW Colorado, and Mesa Verde to show the locations are often in sites of importance such as springs/seeps and a Chacoan amphitheater. I hypothesize these are for collection of sand or blessing objects. I intend to expand our understanding of these grooves and encourage archaeologists to not assume a one size fits all approach to understanding these features.

**Winterhalder, Bruce (UC Davis), Eugene Morin (Trent University), Douglas Bird (Pennsylvania State University) and Rebecca Bliege Bird (Pennsylvania State University)**

[97]

*What Can We Learn from Nearly 50 Years of Accumulated Data on the Kcal Return Rates Achieved by Hunters Encountering Terrestrial Game?*

In the mid-1970s the biologist D. Griffiths proposed that body size determines prey return rates and, citing the diet breadth model, D. S. Wilson stated that the lowest-ranked prey type harvested reveals the general efficiency of the foraging economy. Archaeologists, beginning with Bayham and Anderson, quickly made use of these proposals, initiating a now-large literature using faunal data to analyze resource intensification and its socioeconomic effects. Over the same period, archaeological and ethnographic measurements of resource rankings also have multiplied. Standardization and analysis of 217 of these return rate records from 181 prey types (Morin et al. 2021) reveals that body size generally is a weak predictor of return rates. However, more specific and narrowly defined predictions based on body fat, taxonomic grouping, latitude, hunting technology, and, in some instances, body size, along with multivariate analysis, using such variables can be reliable. These findings raise questions about large-game scenarios of hominin evolution, and how their impact on the intensification literature must be decided on a case-by-case basis.

**Wisner, Gavin (Logan Simpson) and Tucker Austin**

[74]

*Applying Mean Thickness Measurements to Newly Recorded Cohonina Sites on the South Kaibab National Forest, Northern Arizona*

As part of the Four Forest Restoration Initiative, Logan Simpson conducted two intensive cultural resource surveys on the South Kaibab National Forest consisting of more than 1,800 acres in the Upper Basin and

5,330 acres to the east of Red Butte, south of Tusayan, Arizona. Logan Simpson employed the mean thickness model developed by Sorrell (2005) to place Cohonina sites on a continuous temporal scale under the hypothesis that San Francisco Mountain Gray Ware (SFMGW) vessels increase in thickness across time (ca. AD 750–1200). We applied Sorrell's regression equation to date single component Cohonina sites through thickness measurements of SFMGW sherds, providing an estimated habitation date for each site. Logan Simpson applied this technique to samples of surficially deposited sherds on all newly recorded single component Cohonina sites identified within the survey areas to obtain dates on surficial assemblages without tree-ring cutting dates (Sorrell et al. 2018). This poster provides the results of our findings and shows the value of using this chronometric dating method as a part of the initial analysis of unexcavated, single component Cohonina sites. This poster will not include any images of human remains or funerary objects.

Wissler, Amanda [227] see Sharp, Emily

Witham, Samuel [49] see O'Mansky, Matt

**Withee, Katee (US Forest Service)**

[182]

*Successful Partnerships: The Oregon Chinese Diaspora Project*

The Oregon Chinese Diaspora Project (OCDP) is a multi-agency partnership engaged in studying and sharing the history of Oregon's immigrant Chinese communities. Partners include the Southern Oregon University Laboratory of Anthropology, the Malheur National Forest, and the Kam Wah Chung State Heritage Site. The OCDP is currently investigating sites associated with Chinese gold miners in the Blue Mountains of Eastern Oregon. Archaeological testing and research includes metal detector assisted survey, which has led to successful subsurface discoveries. Partners, such as university students and Forest Service: Passport in Time volunteers, have assisted with testing and fieldwork and have increased the value of our research. Additionally, these partnerships and collaborations have heightened public interest in and the visibility of historically underrepresented communities.

**Witt, David (Washington Department of Archaeology and Historic Preservation)**

[156]

*Moderator*

[156]

*Discussant*

**Witt, David (Washington Department of Archaeology and Historic Preservation), Catherine Landis (SUNY ESF) and Neil Patterson Jr. (SUNY ESF)**

[16]

*Management and Memory Work: How Site Management Practices Affect the (Re-)Presentation of Archaeological Landscapes in Western New York*

Archaeological landscapes embody shifting conceptualizations of the individuals who live, work, and play at those locations, both in the past and present. While other papers in this session address such changes in the context of the archaeological past, we bring the discussion to the present. We explore these shifts in relationship between place, human, and nonhuman beings at three sites in the Finger Lakes Region of New York: Ganondagan (seventeenth-century CE Seneca village), Bare Hill (a location often associated with Seneca origins), and Lamoka Lake (a village dating to 2400–2600 BCE). These sites, which are respectively managed by New York State Office of Parks, Recreation, and Historic Preservation (OPRHP); New York State Department of Environmental Conservation (DEC); and jointly by the Archaeological Conservancy and DEC, reflect not only dynamic landscapes in the past (as illustrated by the historical and cultural ecologies of the sites) but also reflect the modern relationships people hold with these locations as embodiments of the past.

We particularly explore the disruptive effects of colonialism to current Indigenous and non-Indigenous understandings of these sites, the practice of site management as a form of colonialism, and how management preserves (or conversely, erases) previous relationships and understandings.

Witt, Kelsey [244] see Brunson, Katherine

Witt, Kelsey [245] see Fisher, Abigail

**Witt, Rachel (Tulane University), Gabriel Prieto (University of Florida), John Verano (Tulane University) and Alan Chachapoyas (Huanchaco Archaeological Program)**  
[134]

*Death that Endures: A Bioarchaeological and Biogeochemical Study of Human Sacrifices from the Moche Valley, Peru*

This project investigates how rituals of human sacrifice performed by the Chimú Empire (AD 1000/1100–1450/1470) transformed in response to Inca imperialism (AD 1450–1532) in the Moche Valley of Peru. Recent discoveries of hundreds of sacrificial victims in the Moche Valley suggest that ritual violence was used to maintain the sociopolitical and religious agendas of elites ruling from the nearby capital city Chan Chan. Numerous archaeological investigations on the north coast of Peru have shown that while the Inca maintained political and economic control of the region, sacrifices originally performed by the Chimú endured despite Inca conquest. Using archaeological, osteological, and stable isotope analyses of multiple human tissues, this project reconstructs the treatment, geographic origins, and diets of human sacrifices from the sites of El Pollo and Pampa la Cruz to explore whether sacrificial rituals changed following the formation of the Chimú Empire and in response to Inca sociopolitical integration.

**Witte, Emilee, Emily Schach and Donna Nash**  
[27]

*Ceramics Crossing Temporal and Cultural Boundaries in the Moquegua Valley*

Ceramic vessels have been produced and in use for thousands of years. Ceramicists are tasked with the duty of creating unique wares and transmitting production knowledge through formal or informal apprentice relationships. In this poster, we compare the vessel forms and functions from the Middle Horizon sites of Cerro Mejia and Cerro Baul to the Late Intermediate period cemetery site Yaracachi. This poster will examine the transmission of morphological and functional characteristics showing local trends transmitted across cultural and temporal boundaries within the Moquegua Valley. While direct transmission of craft production knowledge is possible, I argue that ceramicists within the valley utilized emulation and experimentation to produce the desired long-established Moquegua styles.

Wittich, Christine [249] see Wood, Richard

Wittig, Roman [88] see Cebeiro, Adela

**Woehlke, Stefan (University of Maryland College Park)**  
[138]

*Linking Black Studies and Archaeology through an Intersectional Materialism*

Archaeology is an inherently materialist pursuit linking history to the production of the world in which we live. Black intellectuals have played a critical role in the development of the social theories we use to explain that productive process. This paper will briefly outline some of these historical contributions to social theory and the ways in which they shape the lenses through which we perceive that past. It will then define intersectional materialism and highlight its distinction from other materialisms that have risen in popularity over the past decade. The paper will conclude with a brief case study comparing the homeplaces of enslaved

and free households on and around the property of the Montpelier Foundation in Orange County, Virginia. It will specifically cite the material evidence of architecture, literacy, and visibility for each household and the forces behind the decisions that shaped the material culture associated with each site.

Woehlke, Stefan [57] see Mohammadi, Justin

Wogau, Kurt [54] see Cordova, Carlos

**Wohlgemuth, Eric (Far Western Anthropological Research Group)**

[120]

*Discussant*

**Wolberg, Alexandra (Utah State University), Judson Finley (Utah State University) and Erick Robinson (Boise State University)**

[198]

*Did Arroyo Formation Impact the Occupation of Snake Rock Village, a Fremont Dryland Agricultural Community in Central Utah ca. AD 1000 through 1200?*

Fremont farmers of the northern Colorado Plateau grew maize at the margins of cultivation in western North America. Like other Indigenous farmers throughout the American Southwest, Fremont farmers used bundled agricultural niches where alluvial floodplains were the largest available site for cultivation. But dryland floodplains are a risk to the sustainability of farming communities because the development of steep-sided arroyos lowers water tables, rendering them unusable for growing maize. This study tests the relationship between the occupational timing of Snake Rock Village AD 1000–1200 and the formation of a major 4.5 m deep arroyo. We present a high-precision AMS radiocarbon chronology of the village occupation paired with an AMS radiocarbon and optically stimulated luminescence (OSL) reconstruction of the Ivie Creek floodplain 400 m upstream from the site. The results of this study provide a direct test of arroyo formation as a cause for the abandonment of Fremont agriculture by AD 1300.

Wold, Deborah [181] see Carter, Andrew

**Woldekiros, Helina (Washington University, Saint Louis) and A. Catherine D'Andrea**

[60]

*Archaeological and Biometric Perspectives on the Diversity and Origin of African Chickens*

Early agricultural systems relied on plants and animals originally carried thousands of miles by land and sea. Due to a lack of data and a greater emphasis on domestication processes, early agricultural complexes are less investigated than their domestication counterparts. This paper examines the introduction and evolution of chicken landraces in the Horn of Africa from an archaeological and biometric viewpoint. Domestic chickens (*Gallus gallus domesticus* L. 1758) are one of the most valued farm animals in the world today. Chickens are economically and socially significant in Africa. They are often associated with cuisine and identity and valued for their ability to generate income for poor rural communities. Little is known regarding their introduction and integration into African economies. Ancient and modern African chicken breeds provide unique insights into how humans managed plants and animals in the past and on the technologies early farmers developed to maintain and integrate newly introduced domestic species into local environments and farming practices, maximizing production while preserving biodiversity.

**Wolf, Marc (GC CUNY)**

[84]

*The 2022 Petén Lakes Lidar/GPS Georectification Project*

Remotely sensed lidar data has proven to be a boon for Maya archaeology, from its beginnings at Caracol in Belize, Copan in Honduras, to consortiums of various archaeological projects like Salinas de los Nueve

Cerros, La Corona, Holmul, and elsewhere. In a relatively simple regiment of sensing, detailed cartographic maps can be assembled on an exponentially larger scale than can be mapped manually. However, these images can vary from actual field interpretations and should be “ground-truthed.” Some of the latest lidar imagery was gathered from the Petén Lakes region of Guatemala, and includes several important surrounding ancient settlements. Ucanal, Tayasal, Cenote, Paxcaman, Flores (the prehistoric site overlain by the modern town), and Nixtun-Ch’ich’ are just a few of these. GNSS (Global Navigation Satellite System) positioning and on-the-ground detailed survey is used to solidify the accuracy and precision of these lidar graphics, while also contributing to current humanistic archaeological and anthropological standards and ethical responsibilities. This recent research addresses the technicalities of lidar-verification, GPS (Global Positioning System) usage, and GIS (geographic information system) modeling, while embracing student engagement and development, cultural resources, and the local communities surrounding Lake Petén Itzá and the island of Flores in Guatemala’s Petén Lakes region.

**Wolfe, Allison (Boise State University)**

[97]

*Terminal Pleistocene and Early Holocene Exploitation of Greater Sage-Grouse (Centrocercus urophasianus) in the Bonneville Basin*

Despite extensive study of prehistoric human foraging behavior in the Bonneville basin, little is known about human exploitation of birds, as many of these analyses focus on the hunting of mammalian prey and present models of diet breadth that are limited to artiodactyls and lagomorphs. This study uses the prey choice model of foraging theory to predict the extent and timing of the exploitation of Greater Sage-Grouse (*Centrocercus urophasianus*)—one of the most common avian prey species—in the basin during the terminal Pleistocene and early Holocene. Paleontological and archaeological records show that, as predicted, lower-ranked sage-grouse were incorporated into the human diet when higher-ranked artiodactyl populations were depressed. However, environmental changes during this period also reduced the abundance of sage-grouse in the basin through time, in turn reducing their consumption by humans. This study demonstrates the utility of theoretically informed foraging models in the context of avian prey. Continued examination of Greater Sage-Grouse exploitation across the entirety of the Holocene within the Bonneville basin could provide insight on the long-term impacts of hunting and may thus be useful to inform their modern management.

**Wolff, Christopher (University at Albany)**

[219]

*Chair*

**Wolff, Christopher (University at Albany), Michelle Bebber (Kent State University), Metin Eren (Kent State University), Amanda Samuels (University at Albany) and Donald Holly (Eastern Illinois University)**

[219]

*The Convergence of Metal Projectile Points: Assessing the Relative Influence of Function in Nonhomologous Technological Traditions*

Recently, more attention has been focused on the assessment of convergence versus divergence of technology in the archaeological record. This ties into long-standing debates concerning our ability to recognize if similar traditions resulted from diffusion or migration, as well as the relative influence that function has on the morphology of tools. To identify possible convergence in the invention and production of metal projectile points, our research examines two different technological traditions that shifted from stone to metal materials or supplemented stone with metal, namely the Beothuk of Newfoundland and the Old Copper Culture of the Great Lakes region. They are significantly separated chronologically and geographically and, therefore, are likely not homologous. We examine morphological variation in their metal points and compare it to preceding and contemporaneous stone points in both cultures to examine relationships between tool forms that are similar in function. Our comparative analysis has broader implications in the archaeological interpretation of historical relationships between past peoples and their technological traditions.

Wolff, Christopher [219] see Bebber, Michelle  
Wolff, Christopher [49] see Holly, Donald  
Wolff, Christopher [219] see Samuels, Amanda

**Wolfhagen, Jesse (Purdue University)**

[137]

*Discussant*

[137]

*Chair*

**Wolfhagen, Jesse (Purdue University)**

[137]

*Cyclical Regression Modeling of  $\delta^{18}\text{O}$  Isotopic Profiles on Sparse Samples with Bayesian Multilevel Modeling*  
Profiles of stable oxygen isotopic values ( $\delta^{18}\text{O}$ ) from archaeofaunal tooth enamel provide in-depth information about the past environments in which animals lived while their teeth mineralized. Cyclical regression models can fit a specimen's isotopic profile to a particular sinusoidal curve to estimate aspects of past environments and animal behavior. These include birth seasonality and seasonal environmental variation. Existing models, however, rely on densely sampled specimens, limiting the number of specimens to be analyzed within a particular budget. I present a Bayesian multilevel model to fit cyclical regression curves to enamel  $\delta^{18}\text{O}$  data. These models use prior distributions of the regression parameters to avoid overfitting to sparsely sampled specimens. I test the model's efficacy by modeling first a set of densely sampled specimens, then removing observations to create artificially sparse datasets. The model effectively reconstructs the isotopic profile for sparse datasets. Furthermore, the multilevel structure of the model provides a natural framework for summarizing assemblages, providing a valuable baseline for inter-assemblage comparisons. This Bayesian model helps researchers shift their interpretive focus from specific animal histories to assemblage-level questions. Finally, I discuss how this approach may open new avenues for understanding past herd management.

Wolfhagen, Jesse [137] see Otárola-Castillo, Erik

Wolverton, Steve [218] see Gilmore, Eric

**Womack, Andrew (Furman University), Anke Hein (Oxford University) and Ole Stilborg (Stockholm University)**

[216]

*New Insights into Bronze Age Ceramic Production in Northwestern China: Petrographic Analysis of Qijia and Shajing Materials from the Andersson Collections*

The late Neolithic to late Bronze Age periods (ca. 2300–400 BCE) in what is now northwestern China was a time of significant technological and social change. Based on limited excavation and survey, it has been suggested that major changes took place in subsistence technologies, including a potential shift from sedentary farming to mobile herding, as well as increasing use of metal items. Ceramics are also thought to reflect these transitions based on major changes in vessel form and surface treatment; however, only preliminary analyses of ceramic technology from this time period have taken place. Here we use petrographic analysis of long-dormant collections of ceramics from the Museum of Far Eastern Antiquities in Stockholm, Sweden, to assess changes in ceramic technology and circulation between the Qijia cultural period (2300–1500 BCE) and Shajing cultural period (1000–400 BCE) in northwestern China. Using ceramic petrography, we explore whether paste recipes and other aspects of production shift alongside changes in ceramic form and surface treatment between the Qijia and Shajing periods, or whether there is long-term continuity in production practices.

Womack, Andrew [241] see Gambrill, Kylie

Womack, Andrew [121] see Jaffe, Yitzchak

**Wong, Eponine (University of Oxford), Kacey Grauer (Stanford University), Zachary Nissen (Northwestern University) and Debra Walker (University of Florida)**  
[243]

*Reconfiguring Communities in the Postclassic at Aventura*

Recent excavations have revealed that Postclassic Aventura was a very different place: both reverentially remembered and a home. In this paper, we review the evidence for human activity during the Postclassic period at Aventura. From identifications of Late Postclassic incensario fragments in surface material on domestic mounds to the 1974 excavation of a large deposit of censer fragments in the site core, Aventura is known to have been subject to ritual pilgrimage during the Late Postclassic. Due to the specialized nature of these Postclassic artifacts, it was uncertain if a permanent population was residing at Aventura during that time. Recent excavations by the Aventura Archaeology Project at Group B, one of Aventura's six central plazas, identified Postclassic household remains associated with domestic artifacts. These data suggest that Aventura's site core may have supported a small residential community during the Postclassic period, with excavations revealing reoccupation of earlier buildings in Group B. We conclude this paper by proposing a new hypothesis generated from lidar data and colonial records that Aventura's residents may have moved to a river island in the New River during the Postclassic period, consistent with a pattern of resettlement seen across the region.

**Woo, Katherine (James Cook University)**

[135]

*Middeningly Difficult: Methodological Advances in the Identification and Analysis of Submerged Midden Sites*

[WITHDRAWN]

**Wood, Marilee (University of the Witwatersrand), Laure Dussubieux (Field Museum), Stephanie Wynne-Jones (University of York) and Jeffrey Fleisher (Rice University)**

[210]

*The Glass Beads of Songo Mnara, Tanzania*

The archaeological site of Songo Mnara lies on a small island of the same name just to the south of Kilwa Kisiwani in Tanzania. It was occupied mainly in the fifteenth century CE and its assemblage of 7,444 glass beads provides us with a unique view into Indian Ocean trade to East Africa in this period. A comprehensive study of the morphological properties of the assemblage was followed by chemical analysis using LA-ICP-MS of 140 samples that represented all bead types present. Our results identified four major glass types, including several subtypes, which suggest the beads (or at least the glass used to make them) originated in diverse regions including South Asia, Central Asia, China, and Europe. There is evidence that some beads, particularly the unique decorated folded beads, which are found exclusively at Songo Mnara and neighboring Kilwa, were made locally using glass from imported beads and tubes. In addition, excavations were conducted at multiple locations, including elite stone houses, commoner thatch houses, mosques, burials, and wells, enabling us to examine access to these exotic imports across the site.

**Wood, Richard, Christine Wittich (University of Nebraska, Lincoln), Luis Tuarez (University of Nebraska, Lincoln), Heather Richards-Rissetto (University of Nebraska, Lincoln) and Melvin Elisandro Garza Roldan (Asociación Copán)**

[249]

*Documenting Archaeological Tunnels within the Copan Acropolis, Part 2: Geospatial Data and Structural Modeling of Temple 16*

At the Classic Maya city of Copán, Temple 16 is one of the most prominent structures; however, it is rapidly deteriorating along with other buried structures and archaeological tunnels. Inside Temple 16 are various structures and tombs including Rosalila, a uniquely preserved temple, as well as Oropendola, Clarinero, and

Tortola, all of which cover earlier structures and royal burials. During various construction stages, the ancient Maya destroyed the vast majority of buildings to create foundations for new structures. Rosalila, however, was carefully encased with plaster for preservation before the final construction. Given the uniqueness and importance of this structure combined with the observed deterioration, the research team undertook a geospatial survey of Temple 16 to understand the structural loads for conservation and to characterize the deterioration with respect to recent intense rainstorms and hurricanes. This survey consisted of uncrewed aerial systems, global navigation satellite systems, and ground-based lidar scans encompassing the exterior and interior tunnel excavations yielding georeferenced 3D point clouds. The complexity of the excavations is captured at the centimeter-level for over 2 km of tunnels. This large dataset provides high-resolution and high-fidelity geometry for an accurate 3D structural modeling to understand and guide mitigation techniques for conservation.

Wood, Richard [176] see Ploetz, Chris

**Woodfill, Brent (Winthrop University)**  
[172]

*Revisiting the “Lost Shores” and “Forgotten Peoples” of the Southeastern Chiapan Lowlands*

In spite of the intensity of interest in the ancient Maya, very little research has been conducted to date in lowland eastern Chiapas. This region, crossed by several important rivers and trade routes, connects multiple important areas, including the southern Maya lowlands, the Guatemalan and Caribbean highlands, and the Gulf and Caribbean coasts. Recent research by members of Proyecto Salinas de los Nueve Cerros is focused on a major inland salt producer just over the border in Guatemala, although investigations spilled over into Chiapas in 2017. Over three pre-pandemic field seasons, team members documented multiple new sites and expanded our understanding of several more, with a focus on reconstructing the ancient Maya salt trade. The team has also focused on rediscovering several sites lost to time, especially the colonial period Sak Balam, where the Lakandon were able to maintain their independence from the Spanish Crown until the end of the seventeenth century. In this paper, I discuss some of the findings from this research to understand the changing affiliations and networks in this important frontier zone.

Woodfill, Brent [55] see Gillam, J. Christopher

**Woodhead, Genevieve (University of New Mexico)**  
[86]

*Making Pottery, Making Identity: Geochemical and Design Analyses from a Small Middle San Juan Site, New Mexico*

This study addresses both the geochemical composition and the decorative content of ceramic sherds recovered from the Box B Site (LA 16660), New Mexico. Thorough and successful ceramic analyses by Barbara Mills, Hayward Franklin, and Elizabeth Garrett took place in the 1980s. This current project reexamines white ware ceramics from ca. AD 1100 by taking a communities of practice approach and integrating both compositional and decorative analyses. The goal is to better understand how potters from a small residential site located along the border of two large Ancestral Pueblo ceramic traditions—Chaco and Mesa Verde—practiced pottery-making in the midst of a regional power shift from Chaco Canyon to the north. Compositional data, collected through petrography and scanning electron microscopy (SEM), reveal raw material procurement, slip and paste recipes, and even firing conditions. Painted decorations speak to identity formation in a potential borderland setting.

Woods, Mika [41] see Avendano, Felicia

**Woollen, Katharine (University of Nevada, Las Vegas) and Jennifer Byrnes (University of Nevada, Las Vegas)****[134]***Applying a Social Autopsy Theoretical Framework to Bioarchaeological Analyses*

Not dissimilar to a medical autopsy, whereby a forensic pathologist directs their view inward toward a body's tissues and organs in an attempt to reconstruct and explain an individual's underlying cause of death, social autopsy directs its view outward. A social autopsy dissects the interworking layers of social institutions, political laws and policies, and economic constraints that produce the mortality and morbidity patterns of at-risk groups in an effort to generate reform and policy change. Social autopsy has been utilized in the fields of public health, sociology, and forensic archaeology, but, to date, no bioarchaeological analysis has implemented social autopsy as a theoretical framework. Typically, the social autopsy begins with the analysis of contemporary death phenomena, then probes the historic factors that contribute to increased death rates for a group. Bioarchaeological analyses can flip this line of inquiry to understand what conditions and constraints existed in the past to generate awareness of persisting issues that continue to increase mortality rates of marginalized groups today. This framework argues that reform cannot be implemented without an understanding of the types of systemic issues, oppressive treatment and differential hardships disenfranchised individuals experience(d).

**Wooten, Kimberly (California Department of Transportation)****[1]***Discussant*

Workman, Vanessa [211] see Moore, Katherine

**Worman, F. Scott (Missouri State University) and Elizabeth Sobel (Missouri State University)****[7]***Factories, Families, and Farms: Placing the Phenix Town Site in Context*

For more than a century, books, movies, and other media have portrayed the Ozarks region of the US as historically isolated, rural, backward, and overwhelmingly white. However, recent studies have begun to reveal a more complex and nuanced picture of life in the Ozarks during the late nineteenth and early twentieth centuries. Our investigations of a company town constructed by the Phenix Stone and Lime Company in Southwestern Missouri are part of this new body of work. In a 2019 archaeological field school, we documented site structure and the remnants of public architecture. In a 2022 field school, we focused on the architectural remains and domestic refuse associated with worker households in the company town. Ongoing analyses of the resulting data, along with ethnohistorical research, allow us to explore the variable ways that Phenix workers' households participated in regional and national social and economic networks, the industrial dimensions of daily life, and the demographic position of town residents within a diverse regional population. Quarry workers and their families came from a wide range of backgrounds and contributed to a complex set of economic, ecological, demographic, and racial shifts in the Ozarks prior to World War II.

**Wright, David (University of Oslo)****[166]***Not All Who Wander Are Lost (or, the Awkward Adolescence of a Retiring Giant . . .)*

It is hard to hold a candle to the career of David Killick and catch a reflection that adequately reflects the scope and breadth of his contributions to the discipline of archaeology. Those of us who know him well undoubtedly have seen his commitment to separate fact from fiction in the human past, incredible breadth of knowledge of minerals and metals in provenance studies, holding of the bar high for the archaeological sciences, and occasional salty "dialogues" with colleagues. He is also humble, generous, humorous, and

unflinching in his promotion of underdogs from nontraditional academic circumstances. In this talk, I attempt to hold the candle up to draw the tendrils that connect Dave to the evolution of the archaeological sciences more broadly. His legacy is large, but he is the first to admit that he is still growing and learning, despite his prodigious scope of knowledge and accomplishments. He has charted a path for those of us who also wander and seek deeper insights into the human condition, wherever we can find it.

Wright, Henry [76] see Luurtsema, Anna

Wright, Ian [167] see Hora, Elizabeth

**Wright, Joshua (University of Aberdeen)**

[79]

*Discussant*

[79]

*Chair*

**Wright, Joshua (University of Aberdeen), William Honeychurch (Yale University), Chunag Amartuvshin (National University of Mongolia) and Sarah Pleuger (University of Edinburgh)**  
[244]

*The Delgerkhaan uul Survey: Preliminary Results*

The paper reports on a full coverage intensive survey of a water rich region in the Southeast Gobi desert, Mongolia, which with the support of many excavations provide a robust chronological framework from the mid-Holocene to the historic Manchu period. Archaeological survey recorded an extensive and unique monumental landscape of the Eastern Steppe Bronze Age prone burial tradition alongside a longer contemporary habitation record. Together these demonstrate multiscale spatial complexity, asymmetric regional settlement patterns, and adaptation to the changing Gobi environment. The region contains a large Xiongnu (Late Iron Age) period cemetery complex, built without an extensive habitation system—a typical Gobi phenomenon. Surface artifacts and mortuary practices show continuity into the early medieval Turkic period and also a medieval landscape of extensive habitations and diverse monumental structures. Together these results provide a dense and rich dataset of regional archaeology at heart of arid Northeast Asia that cross-cuts traditional chronologies and both integrates larger Eurasian trends and resists them.

Wright, Joshua [202] see Flad, Rowan

Wright, Joshua [202] see Li, Shuicheng

**Wright, Kevin (University of Oklahoma)**

[95]

*Assessing the Viability of Shallow Geophysical Surveying to Identify Post-Removal Homesteads in Choctaw Nation*

In 2020, Choctaw Nation Historic Preservation (CNHP) began a project to identify and document Choctaw homesteads in Southeastern Oklahoma. Although these sites are an essential part of Choctaw cultural heritage, the locations of many of these sites remain unknown. To assist CNHP's goals of locating these culturally important sites, a "pilot study" was conducted in collaboration with the University of Oklahoma to assess the ability of shallow geophysical methods of remote sensing to identify features associated with post-Removal Choctaw homesteads. In this paper, we present the results of this study while also discussing the potential that remote sensing has for addressing community-based questions and complying with desires for low-impact archaeology.

Wright, Sterling [82] see Rabinowitz, Adam

**Wriston, Teresa (Desert Research Institute), Christina Neudorf (Desert Research Institute) and Gary Haynes (University of Nevada, Reno)****[170]***Luminescence Age Calculation Models, Termites, and Dune History in the Northern Kalahari Desert, Hwange National Park, Zimbabwe*

Archaeologists often accept optically stimulated luminescence (OSL) ages with less critical review than those derived from the more commonly used radiocarbon dating methods. This is largely because of an incomplete understanding of optical dating techniques and the modeling assumptions used to calculate these ages. In this paper we compare ages derived using four commonly applied OSL age calculation models based on different assumptions about our sample site at Josivanini Dune. Our varying results show how sensitive OSL derived ages are to dune formation and postdepositional processes, such as bioturbation by termites. We combine this data, radiocarbon ages, and field observations to gain insights into Late Pleistocene and Holocene dune reactivation in the Kalahari Desert and discuss the implications for archaeological studies in the northern Kalahari Desert.

Wriston, Teresa [62] see Fitty, James

Wriston, Teresa [62] see Lancaster, JD

Wrobel, Gabriel [102] see Marshall, Aubree

**Wyatt, Andrew (Middle Tennessee State University) and Clelie Cottle Peacock (University of Southern Mississippi)****[234]***Uncovering Nashville's African-American Heritage: The Bass Street Community Archaeology Project*

Since 2017, the Bass Street Community Archaeology Project has been conducting excavations at the site of one of the earliest African American neighborhoods in post-Civil War Nashville. The Bass Street Community was located on the north side of Saint Cloud Hill, the site of Fort Negley, a Civil War-era fort constructed by the Union forces in Nashville. Formerly enslaved persons who joined with Union forces were pressed into service to construct the fort, forming settlements on the slopes of Saint Cloud Hill that developed into permanent neighborhoods following the end of the Civil War. The neighborhood at Bass Street was a thriving yet marginalized community up until the 1960s when it was demolished and the people relocated for the construction of the interstate system. In this presentation, we will be discussing how residents of the Bass Street Community constructed and maintained their collective identity within the Jim Crow-era South and through the Civil Rights era. We will also be discussing the difficulties as well as the implications of conducting archaeological research on a politically contentious topic.

Wyatt, Katie [169] see Watson, Sara

**Wyatt, Noella****[42]***Tryon Creek (35-WA-288) Projectile Point/Base Comparisons through Strata/Levels*

This research was conducted based on artifacts in the Tryon Creek (35-WA-288) collection. It began as a study of intact projectile points ( $n = 126$ ) found within House 2. This enabled comparisons of points based on width, length, thickness, and base type. Material types were analyzed. The research was then expanded to include lithic artifacts that were intact enough to determine the base type, expanding the number of artifacts for research on point/base types throughout House 2 and the Trenches ( $n = 236$ ), as well as artifacts coming from Houses 5 and 8 ( $n = 17$ ). This poster includes parts of each of these research projects showing a lack of change in point/base types through time. Particularly within House 2, point/base types are distributed throughout all strata/levels. Except for the deepest level at 48.50, which contained a single Basal-Notched

point, Corner-Notched points were found through every level of the excavation. By increasing the number of artifacts in the study, it gave us a more comprehensive look at point/base styles to be placed within strata/levels. By adding the artifacts within Houses 5 and 8 and the Trenches, it continued to show a lack of dimorphism through time.

**Wyatt, Scott (Bureau of Land Management)**

[182]

*Battle Mountain, Nevada, Annual 6th Grader Presentation by the Bureau of Land Management (BLM)*

Every spring, the Battle Mountain BLM, Mount Lewis Field Office, puts on a presentation for 6th graders from the local elementary school. The presentations are conducted at the Mill Creek Campground, approximately 30 minutes south of Battle Mountain. It is an all-day event, and the more departments we have doing presentations, the smaller the groups of kids. With between five and nine departments conducting presentations, group sizes generally range from four to eight kids. Departments typically include Fire, Wildlife, Wild Horse and Burro, Cultural, Range, and whomever else we can muster. Recently the USGS has been joining us, conducting a presentation on wilderness emergency medical treatment. The majority of the kids really look forward to it. One has to say “the majority,” as, well, kids will be kids. The 2020 presentation was canceled due to COVID concerns. It is so popular that the 2022 8th graders, the class that had missed it in 2020, requested that the BLM conduct the presentations for them in school.

**Wygala, Brian (Adelphi University), Kathryn Krasinski (Adelphi University), Charles Holmes (University of Alaska, Fairbanks), Barbara Crass (University of Alaska Museum of the North) and Jessica Metcalfe (Lakehead University)**

[15]

*Archaeological Recovery of Late Pleistocene Hair and Environmental DNA from Interior Alaska*

Ancient hair and remnant plant DNA are important environmental proxies that preserve for millennia in specific archaeological contexts. However, recovery has been rare from late Pleistocene sites and more may be found if deliberately sought. Once discovered, singular hair fragments are not easily identified to taxa through comparative analyses and environmental DNA (eDNA) extraction can be complicated by factors of preservation or contamination. In this paper, we present our methods for the combined recovery of ancient hair specimens and eDNA from sediments to improve our understanding of late Pleistocene environments from the Holzman site along Shaw Creek in interior Alaska. The approach serves as a useful case study for learning more about local environmental changes.

**Wyllie, Cherra**

[9]

*Pieces of Bone and Pieces of Clay: Tableaus and Caches in Classic Period South-Central Veracruz*

For more than eight decades, numerous ritually interred figurines and skeletal remains have been found in Classic Veracruz architecture. These caches contain tableaus of small, medium, and large-scale ceramic sculpture in conjunction with primary and secondary burials, and deposits of dismembered human bones. Ceramic figures enact scenes depicting captives, tribute, the Mesoamerican ballgame, and an underworld inhabited by deities and supporting players: themes concurrent with those found on Classic Veracruz narrative ceramics, mural painting, and architectural sculpture. Nevertheless, the jumble of bones and ritual destruction of clay objects in these deposits compound interpretations. For example, both clay and bone form *munecas*, or marionettes, that could be activated in macabre dances of the dead. Recent analysis by forensic anthropologist Vera Tiesler and her colleagues reveal that the elite male from Cerro de las Mesas Burial II-18 is in reality a collection of bones from disparate individuals. In this presentation, I examine entwined concepts of part and whole, bones and clay, sentient agency and material form. This analysis is further informed by the groundbreaking work of archaeologists Annick Daneels and Adriana Aqüero Reyes at La Joya, Veracruz, and recent studies by Julia Guernsey and others on human figuration and fragmentation.

**Wynia, Katie (Portland State University), Devin Martin (Portland State University) and Douglas Wilson (National Park Service)**  
[182]

*The 2022 Public Archaeology Field School at Fort Vancouver National Historic Site: Decolonizing the Hudson's Bay Company Schoolhouses*

The Public Archaeology Field School at Fort Vancouver National Historic Site, in Vancouver, Washington, is a long-standing partnership between Portland State University, Washington State University Vancouver, and the National Park Service. The program teaches archaeological field methods to undergraduate and graduate students while providing opportunities for visitors to learn about archaeology and the site's colonial history. Students are trained in interpretation skills and are required to interact with visitors, answering questions about how archaeology can explore colonial period history. The 2022 field school excavated at sites of the ca. 1836–1849 Hudson's Bay Company schoolhouses to test previously unexcavated portions of the park and to further the park's efforts to decolonize the interpretation of colonial history. Public archaeology included training for staff and students on the difficult history of these schoolhouses and wider national importance, dialogue with visitors, social media posts, web articles, the Kids Dig program that engages children in archaeology using mock excavations, a formal "schoolhouse tour" led by the park's interpreters, and special tours for agency and tribal groups. The project uncovered evidence of two schoolhouse structures and related activities, and revealed the challenges of expressing difficult stories at NPS sites.

Wynne-Jones, Stephanie [166] see Brewer-Jensen, Ella

Wynne-Jones, Stephanie [210] see Wood, Marilee

**Wysocka, Joanna (Polish Academy of Sciences), Beata Drupka, Paige Lynch (University of New Mexico) and Marcin Krzepakowski (Museum of Wagrowiec, Poland)**  
[251]

*Analysis of the Vertebral Pathologies among Individuals from Fourteenth- to Eighteenth-Century Polish Cemeteries: Comparison between the Village and Town Inhabitants in Greater Poland*

Vertebral degenerative changes are one of the most common pathologies found among historical human skeletal remains. They occur naturally with age and/or as a result of activity-related stress or illness. This study examines human remains discovered during the archaeological excavation of cemeteries from the town Dzwonowo (fourteenth–eighteenth centuries) and the village Gać (fourteenth–sixteenth centuries). These projects are focused on discovering lost settlements within the Zielonka Forest in Poland. Macroscopic observation analysis included frequency of Schmorl's nodes (SN), osteophytosis of the vertebral bodies (VO), osteoarthritis of the articular facets (OA), ossification ligamentum flavum (OLF), osteochondrosis of the vertebral bodies (intervertebral osteochondrosis [IO]), and frontal rim of the body (vertebral epiphysitis [VE]). The prevalence of each pathology was calculated and compared between populations in the context of age and sex of the individuals. Results are presented by individuals (crude prevalence rate), and by skeletal element (true prevalence rate). The aim of the study is to indicate the differences in physical work, resulting from the discrepancies in the work performed between the inhabitants of the village and the town. This is accomplished by comparing the prevalence of the vertebral pathologies between populations from similar periods and environments. The presentation will include images of human remains.

Wysocka, Joanna [251] see Gembicki, Maciej

Xavier, Adrienne Lickers [181] see Chakraborty, Kalyan Sekhar

Xie, Guangmau [109] see Kelley, Kathleen

Yadmaa, Tserendagva [54] see Rosen, Arlene

**Yaeger, Jason (University of Texas, San Antonio)**  
**[110]**

*Discussant*

Yaeger, Jason [165] see Cap, Bernadette

Yaeger, Jason [93] see LeCount, Lisa

Yang, Dongya [218] see Boileau, Arianne

Yang, Dongya [218] see Moss, Madonna

Yang, Dongya [163] see Shichiza, Yuka

Yang, Dongya [218] see Speller, Camilla

Yang, Yuechen [95] see Morrow, Giles

Yaworsky, Peter [198] see Byers, David

Yazedjian, Laura [29] see Tarrant, Damon

Yellen, John [212] see Brooks, Alison

**Yeske, Kate (Northern Land Use Research Alaska), Thomas Allen (Northern Land Use Research Alaska), Robert Bowman (Northern Land Use Research Alaska) and Holly McKinney (Alaska DOT&PF)**

**[15]**

*The Hess Creek Site and Implications for Livengood and Yukon River Archaeology*

The Hess Creek Site (LIV-00001) is a multicomponent site 36 km southeast of the Yukon River within the Yukon-Tanana uplands. It was initially located in 1969, tested and partially excavated in 1970, and revisited in 1975, 2016, 2020, and 2021. Extensive excavation in 2021 shows a potential separation between two cultural zones, Cultural Zone 1 (CZ1) and Cultural Zone 2 (CZ2). CZ1 exhibits faunal processing, organic-composite tool production, informal tool utilization, and formal tool maintenance. Lithic provenance analysis from all components suggests that most material was obtained from Hess Creek, 200 m east, demonstrating that use of secondary geological sources is a long-standing feature of procurement in the region. Radiocarbon samples date CZ1 to the Late to Middle Holocene. CZ2 contains evidence of limited early stage lithic reduction and a diagnostic Chindadn type II projectile point dating CZ2 to the Late Pleistocene. Stratigraphic data from LIV-00001 indicates disturbance from cryoturbation and solifluction; however, in less altered locations, paleoenvironmental proxy data suggests potential dramatic environmental changes during the Terminal Pleistocene to Early Holocene transition, with more subtle changes occurring subsequently. LIV-00001 currently represents the northernmost example of Chindadn-Nenana Complex technology and is one of two identified Chindadn-Nenana Complex Yukon River sites.

Yezi-Woodley, Katrina [41] see Melton, J. Anne

**Yi, Hailin, Peter Rowley-Conwy (Durham University), Mike Church (Durham University) and Quanfa Cai (Henan Provincial Institute of Cultural Heritage an)**  
**[203]**

*Faunal Evidence for a Big Feast Event within a Bronze Age City Site in China*

The Zhenghan Gucheng (郑韩故城) site is a well-preserved ancient capital city of Zheng and Han states during Eastern Zhou. It is located at the joining of River Shuangji (Ancient river Wei) and the Yellow River (Ancient river Qin), lying beneath modern Xinzheng city, Henan province, China. Within this city site, well-developed area division and function distribution reveal the appearance of status hierarchy and labor division. In 1996, from the Redianchang excavation point, 501 pieces of disarticulated faunal samples were excavated from a large faunal midden pit, among which 472 pieces belonged to at least six cattle (*Bos taurus*) individuals. Based on the observation of epiphysis fusion and teeth eruption, we were surprised to find that these cattle individuals were all about 18 months old, indicating they were killed at the same time. Good preservation also indicates this set of debris was discarded and covered rapidly after consumption. This evidence of considerable meat consumption suggests a big feast event occurred in this location.

**Yoder, David (Weber State University)**

**[133]**

*The Anthropomorphic Figurine Tradition of the Fremont Archaeological Culture*

For almost a century, clay figurines have been described as one of the defining traits of the Fremont culture of the eastern Great Basin and northern Colorado Plateau. But surprisingly, many questions about the figurines' basic characteristics, distribution, chronology, and meaning have remained unanswered. In this presentation I discuss the results of an analysis of over 800 such artifacts, highlighting what they can tell us about Fremont continuity and variety, sex and gender, dress, and childhood.

**Yoffee, Norman (U Michigan)**

**[61]**

*Discussant*

Yohe, Robert, II [21] see Rogers, Alexander

**Yost, Scott, R. E. Burrillo (PaleoWest) and Harland Ash (PaleoWest)**

**[201]**

*Settlement and Subsistence at the Headwaters of Silver Creek, Western Arizona*

The Silver Creek drainage in north-central Arizona was a focal point of Ancestral Pueblo population aggregation in the late thirteenth century during a time in which the nearby Colorado Plateau was all but depopulated. With a few notable exceptions, most of the masonry pueblos and villages in the greater Silver Creek area were subsequently destroyed by modern developments. PaleoWest recently conducted approximately 3,000 acres of cultural resource inventory near the headwaters of Silver Creek itself for fuels reduction projects on behalf of the Arizona Game and Fish Department and the Arizona Department of Forestry and Fire Management. The results suggest that enough archaeology remains intact to answer important questions about settlement and use of the local ecosystem during a time of climatic and cultural upheaval in the greater Southwest.

**You, Sen (Jilin University, Changchun, China), Long Wang (Academy of Turfanology, Turpan, China), John Olsen (University of Arizona, Tucson), Ying Guan (Key Laboratory of Vertebrate Evolution and Human Origins) and Quanchao Zhang (Jilin University)**

**[29]**

*Starch Remains from Human Teeth Reveal the Bronze and Early Iron Ages Vegetal Diet of Xinjiang, Northwest China*  
 China's Xinjiang Uyghur Autonomous Region has long been a vital link between Europe and eastern Asia. In the past, understanding prehistoric diets in Xinjiang was based mainly on carbonized plant remains unearthed from

archaeological sites and isotopic analyses of excavated human bones. Here, we report on our analysis of human dental residues preserved on the teeth of occupants of the Jiayi Cemetery, a Late Bronze to Early Iron Age site in the Turpan Basin, in order to explore the region's ancient vegetal dietary composition. Morphological analysis of starch granules and comparative data indicate that crops of Triticeae tribe and subfamily Panicoideae comprised a large portion of the diet, while common legumes, nuts, root, and tuber were also present, although in relatively smaller proportions. With supporting evidence drawn from zooarchaeological, archaeobotanical, and paleo-isotopic studies of Bronze Age sites in Xinjiang, we conclude that the people interred in the Jiayi Cemetery practiced cereal crop cultivation and animal husbandry in the Late Bronze and Early Iron Ages, which may be the result of a combination of natural environmental and social factors. The species of cereal crops represented suggest meaningful economic communication between Central and West Asia.

You, Sen [102] see Sun, Xiaofan

Young, D. Craig [41] see Freund, Kyle

Young, D. Craig [74] see Hart, Isaac

**Young, Heather, Cala Castleberry (PaleoWest) and Michael Foster (PaleoWest)**  
**[201]**

*Archaeological Reconnaissance Survey of the Bluffs of St. Teresa, Franklin County, Florida*

PaleoWest conducted an archaeological reconnaissance survey in the fall of 2021 through spring of 2022 on a 7,234-acre parcel located on St. James Island in Franklin County, Florida. The project area focused on the newly acquired Bluffs of St. Teresa hiking tract within Bald Point State Park along the Ochlockonee River and Ochlockonee Bay. PaleoWest was tasked with relocating and delineating site boundaries in the newly acquired public land to aid Florida's Division of Recreation and Parks, Florida Department of Environmental Protection, and Florida Forest Service in future land management efforts. PaleoWest investigated this parcel by conducting a desktop assessment of the area followed by a proprietary method of reconnaissance survey using shovel testing at various intervals, with a focus on testing previously recorded sites as well as investigating high probability areas for potential new sites. PaleoWest's assessment of the area further contributed to archaeological knowledge and interpretation of cultural resources along the Bluffs of St. Teresa.

Young, Mary Lawrence [77] see Buffington, Abigail

Youngblood, Michael [124] see Pryor, John

**Youth, Ian (Archaeology Southwest) and Karen Schollmeyer (Archaeology Southwest)**  
**[199]**

*Quantitatively Modeling the Relationship between Watershed Size and Site Size in Sixth–Tenth-Century Gila and Mimbres Regions, Southwestern New Mexico*

This project quantitatively investigates the relationship between watershed size and site size within the Gila and Mimbres regions of southwestern New Mexico. Throughout the later first millennium CE, larger sites in these regions tended to occupy areas where smaller tributaries flowed into primary drainage systems and where floodplains widened after narrower areas. Archival GIS and spatial reference data and structural information for hundreds of sites will allow us to determine whether primary settlements in the Gila and Mimbres regions were located in comparatively large catchment areas, as well as the extent to which these sites were susceptible to flooding. The resulting map and model of the greater region will provide insight into the impact of environmental stressors on socially important settlements, enabling us to better understand how people may have mitigated the effects of recurring natural disasters to ensure regional social stability.

Youth, Ian [26] see Baitzel, Sarah

**Yu, Chun****[67]**

*Regionalization of Chinese Buddhist Carving in the Fifth through Seventh Centuries: Localization of Practice in the Place and Face of the Buddha*

Over the course of the last two decades there have been a number of hoards of Buddhist statues excavated in Northern China. Each of these hoards contains several hundred statues of varying forms and quality. This study examines both the form and the tool marks on the statues to assess the degree of localization present within the statues. In studying statues from several hoards, including the Longxing Si site in Shandong, the Wanfo Si site in Chengdu, and the Leshanni Si site in Xi'an, this study identifies the majority of the statues in each case as coming from multiple workshops within each region.

Yu, Chun [67] see Monteith, Francesca

**Yu, Xin, Hailin Liu and Chunxue Wang****[122]**

*Study on Animal Remains Excavated from G1 of Dongshantou Site in Da'an, Jilin Province, China*

Da'an Dongshantou is a fine stone cultural site in the Neolithic period. A large number of animal skeletons were found in site G1, totaling 2,456, including mollusks, fish, birds, and mammals. Statistics and analysis of the individual and population of the animal skeletons unearthed from site G1 provide clues for restoring the ecological environment of the site and surrounding areas, discussing the economic model of residents and dietary structure.

Yu, Xin [70] see Liu, Hailin

**Zabecki, Melissa****[167]**

*A Plan to Revive a Failed Stewardship Program*

Site stewardship looks different in every state based on how the archaeology programs are organized. Public archaeological networks, archaeological surveys, SHPOs, state archaeologist offices, academic departments, and volunteer organizations are connected in infinite configurations state by state, so identifying common reasons for site stewardship program collapse can be difficult. Furthermore, finding ways to revive past programs can seem overwhelming as there is no easy formula to follow. Starting from scratch can be difficult or impossible, so picking out strong aspects of old programs and strengthening them with updated actions might bring new life into site stewardship efforts. This paper will look at how the Arkansas Site Stewardship program failed, compare it with other known failed programs, and propose a plan for a revamp.

Zagorska, Ilga [53] see Schulting, Rick

**Zaia, Sara (Harvard University)****[55]**

*The Land of Fantastic Treasures and How to Get There: Modeling Routes to Punt*

The name Punt, the fabulous land of the gods, is known since the discovery and excavation of the temple of Hatshepsut at Deir el-Bahari. The queen undertook a commercial expedition to the land of Punt to collect precious materials to carry back to Egypt. Such resources were crucial for performing religious ceremonies and funerary rituals. Although the matter of Punt's location is still open for debate, archaeological investigations of the last decades have suggested that part of Punt was located in Eastern Africa, including modern Eastern Sudan, Eritrea, and Somalia. The information regarding the route(s) to Punt, how to get there, and the organization of expeditions to Punt are scarce and incomplete. This study presents a methodology involving remote sensing and GIS analyses to identify such long-distance trade routes based on

geomorphology, information extracted from ancient texts, and nutritional studies. The identified route(s) are the most advantageous and efficient, connecting Memphis (modern Cairo, ancient capital of Egypt) and Eastern Sudan (part of Punt).

Zapata Benites, Carlos [164] see Price, Seth

Zarina, Gunita [53] see Schulting, Rick

**Zariñán, Nora (Escuela de Antropología e Historia del Norte de México)**

[51]

*Rethinking Our Concepts to Rethink Our Data: Interpreting the Material Culture of Northwest Mexico in Light of Indigenous Theory*

It has been a while since anthropology experienced an ontological turn that calls to question the universal application of Western concepts, such as nature, culture, and humanity. That questioning, however, has not permeated enough into anthropology, but even much less into archaeology. So, although archaeology includes a plethora of methods, techniques, and interpretative theories, in this respect we are falling behind. In this presentation I discuss some of the implications of this ontological turn in archaeology taking examples from Northwest Mexico and my fieldwork experience in the Sierra Madre Occidental among the Wixaritari (Huicholes). For example, I analyze how to rethink how our concepts impact our comprehension of masks, figurines, ceramic vessels, sculptures, osteological remains, or their archaeological contexts. This exercise forces us to analyze and recognize that our Western conceptual frameworks are not universal, but, instead, many times they are inadequate for interpreting prehispanic material culture. As researchers, we need to recognize that it is not just valid and ethical but necessary to analyze and to apply Indigenous knowledge, their theories, and their concepts to aid in our interpretations because that is equal to or more legitimate than ours.

**Zarzycka, Sandra (Bureau of Land Management)**

[182]

*Public Engagement and Research Efforts within Grand Staircase-Escalante National Monument*

Grand Staircase-Escalante National Monument (GSENM) is approximately 1.87 million acres, with a dense and diverse cultural history. The monument is located in southern Utah and is managed by the Bureau of Land Management. The extensive array of cultural resources is managed by one archaeologist, who relies greatly on the efforts of invaluable public stewards to monitor cultural resources. In partnership with the Utah Cultural Site Stewardship program, over 40 individuals volunteer their time to monitor historic properties on GSENM. The passion to help protect and preserve cultural resources within GSENM could not be possible without public outreach and education. Public outreach efforts to local communities are crucial to help spread awareness of the sensitivity and significance of historic properties within the monument. Efforts to educate the public are of utmost importance, as visitation to GSENM continues to increase. One mission of GSENM is to serve as an outdoor laboratory and promote and maintain partnerships with universities and organizations for research purposes. Part of the process includes partnering with historians who have gathered hundreds of oral histories from local residents and descendant communities with cultural ties to the Monument. Additionally, partnerships with Tribal Nations are important to the GSENM programs.

Zazueta, Inés [204] see Medina, Isabella

**Zborover, Danny (British Museum) and Alex Badillo (Indiana State University)**

[50]

*Petroglyphs in Context: Documenting and Interpreting the Chillihuay Archaeological Complex, Southern Peru*

With over 1,000 individual pictorial elements, Chillihuay is among the largest and most impressive concentration of petroglyphs in southern Peru. Carved on geologically distinct rock outcrops high above the Chorunga Valley, these anthropomorphic, zoomorphic, abstract, and geometrical designs were distributed

along narrow trails and hard-to-reach canyons from the Early Horizon to colonial and modern periods. While Chillihuay was known to archaeologists since at least the 1990s, little systematic research has been conducted on the function and meaning of this enigmatic site. This presentation builds on the latest results of the Proyecto Arqueológico Corral Redondo, to consider the site in its broader chronological and cultural context. In order to better analyze and visualize individual petroglyphs and intrasite patterns, we employed traditional field methods combined with GPS documentation, 3D digital technologies such as SfM and UAV photogrammetry, and VR. Other significant patterns emerge on an interregional scale, particularly in respect to the site's position relative to other major petroglyph concentrations such as Caravelí, Illomas, Toro Muerto, and Quilcapampa. Finally, we comment on the site's importance to the local communities and its alarming rate of destruction by natural and human-induced factors.

**Zender, Marc (Tulane University)**

[158]

*Discussant*

**Zender, Marc (Tulane University) and Mary Kate Kelly**

[93]

*On the Place of Sa-ja-la Title Holders in the Classic Maya Regime*

Since they began to be discerned in the 1980s, much has been written about the political offices and roles of various secondary members of the Classic Maya court. In particular, the political office of *sa-ja-la* has come to be seen as that of a “governor” of smaller settlements within and between Classic Maya centers. However, the presumed role of *sa-ja-la* largely derives from contextual and functional analyses, since the glyphic title itself remains of uncertain pronunciation, with an opaque etymology, and no discernible descendants in either colonial or modern Mayan languages. Further, the contexts in which these title-holders appear requires reappraisal: texts commissioned by them are few and far between, and such as there are often exhibit different concerns than the more numerous texts in which they are referenced by the higher-ranking lords who placed them in office, often within months of their own accessions. In this paper, we not only reassess what is currently known but also soberly consider what can be known about the holders of the *sa-ja-la* title. We hope this will provide a firmer foundation for comparative and conjunctive approaches to the scope and significance of *sa-ja-la* within the Classic Maya regime.

Zerboni, Andrea [87] see Negrino, Fabio

**Zetz, Amanda, Marisol Cortes-Rincon (Cal Poly Humboldt), Kristen Harrison (Cal Poly Humboldt), Raylene Borrego (Cal Poly Humboldt) and Hannah Vizcarra (Cal Poly Humboldt)**

[95]

*Digitizing Archaeological Data from the Dos Hombres to Gran Cacao Archaeology Project*

A wealth of digital data is produced during an archaeological excavation and because so much of the fieldwork is unrepeatable, once the site is fully excavated, the digital records must be archived in a manner that best facilitates reuse. This paper presents the ongoing undertaking of digitizing data for the Dos Hombres to Gran Cacao Archaeology Project located in northwestern Belize. We discuss the problems encountered and how they reflect the wider issues of the reuse of digital archaeological data. Additionally, we provide recommendations specific to chronological data that seek to address the problems for a better workflow and dissemination of the data. A database created for archaeologists, by archaeologists, is a versatile tool and has real benefit in both formulating and answering research questions in the course of fieldwork as well as in secondary analyses.

Zetz, Amanda [77] see Borrego, Raylene

Zetz, Amanda [17] see Cortes-Rincon, Marisol

Zetz, Amanda [55] see Vizcarra, Hannah

Zhang, Grace [218] see Boileau, Arianne

Zhang, Peiqi [169] see Watson, Sara

Zhang, Quanchao [102] see Sun, Xiaofan

Zhang, Quanchao [29] see You, Sen

**Zhang, Xuewei, Jiaqi Wang and Chunxue Wang  
[28]**

*Stone Armor 2,200 Years Ago: Large-Scale Specialized Workshop in Early China*

Stone armor was unearthed in Pit K9801 of the Mausoleum of the First Qin Emperor in 1998. In 2001, a large number of stone armor semi-finished products and processing tools were again discovered in a well of Qin Dynasty in Xinfeng Town on the south bank of the Wei River, clarifying for the first time where stone armor was produced. In 2019, stone armor was also found in the Liujiagou site (LJGS), the core area of Xianyang city which is the capital of Qin Dynasty, by the Shaanxi Academy of Archaeology. The site unearthed a large number of semi-finished and salvaged stone armor plates as well as processing tools. The form of these stone armor is consistent with those excavated from the Mausoleum of the First Qin Emperor and the well in Xinfeng town. This paper focusing on stone armor's production process divided by production stage is a compendium of the stone armor unearthed in 2019. In the process of recovering the production process, the reasons for the abandonment of the stone armor are clarified, and some of the broken but highly finished armor plates are corresponded to the parts of the sets of armor to which they belong.

Zhang, Xuewei [41] see Wang, Jiaqi

Zheng, Xinyuan [175] see Briggs, Emily

Zhou, Hui [67] see Tang, Liya

Zhou, Zhiqing [202] see Flad, Rowan

Zhou, Zhiqing [202] see Jiang, Ming

Zhou, Zhiqing [202] see Lin, Kuei-chen

Zhu, Jynnifer [76] see Oliver, Kristin

**Zhu, Ruoyu (Washington University, St. Louis), Sarah Kennedy (Carleton College), Arturo Rivera I. (Independent Researcher) and Sarah Baitzel (Washington University, St. Louis)  
[70]**

*Camelid Variation and Subsistence Diversity: Insights from Osteometric Analysis and Zooarchaeological Assemblages at the Eleventh-Century CE Site of Los Batanes (Sama, Peru)*

Inhabitants of the Terminal Middle Horizon site of Los Batanes (Sama Valley, southern Peru) founded by Tiwanaku-descendant groups in the eleventh century CE practiced a mixed subsistence strategy. Located along a natural corridor that connects the south-central Andean highlands and coast, residents had access to and a taste for local, highland, and marine resources that make up the zooarchaeological remains recovered from the site. Andean camelids predominate the faunal assemblage. Dung, raw, and processed fiber found in

excavations indicate the animals were likely herded and raised near the site, but questions remain about which camelid species were present and preferred and how they were used. Here we report results from the osteometric analysis of measurements taken from 42 camelid first phalanges to illustrate variations in camelid species represented at Los Batanes and their economic and social role. In light of recent studies of camelid husbandry along the Andean coast, which have focused on camelid diet and mobility, this study establishes important baselines about species diversity that are critical for understanding prehispanic camelid-herding practices in hyperarid coastal environments.

Zhuniskhanov, Aidyn [141] see Dupuy, Paula

Zhuniskhanov, Aidyn [141] see Tashmanbetova, Zhuldyz

**Zimmer-Dauphinee, James (Vanderbilt University), Steven Wernke (Vanderbilt University), Parker VanValkenburgh (Brown University) and Grecia Roque (National University of San Marcos)**

**[55]**

*Trans-regional Agricultural Deintensification: An AI-Assisted Survey of Agricultural Infrastructure in the South-Central Andes*

Since late prehispanic times, peoples throughout the central Andean highlands have created highly productive anthropogenic agricultural landscapes on a monumental scale through terracing. Yet a large proportion of these terrace systems fell into disrepair and abandonment through the Spanish colonial period, even in the face of food shortages. The mechanisms and patterns of such agricultural deintensification remain poorly understood, in large measure because we lack a trans-regional view of the extent and distribution of terrace abandonment. Field-based pedestrian survey cannot capture trans-regional distributions of agricultural deintensification, while manual digitization of terraced areas via imagery survey is slow and labor intensive. This research develops and deploys convolutional neural network-based image segmentation of high-resolution satellite imagery in the South-Central Andes to map the distribution of active and abandoned terracing. This AI-assisted image segmentation renders a continuous distributional view of terrace infrastructure in an area in excess of 100,000 km<sup>2</sup>. Given the innovative approach to large-scale imagery survey, we evaluate the data for quality and potential biases before using multivariate spatial statistics to identify factors driving patterns of agricultural deintensification.

Zimmerman, Michael [105] see Cipolla, Lisa

**Zimmermann, Mario (University of Puget Sound) and Shannon Tushingham (Washington State University)**

**[8]**

*A Review of the Archaeological Evidence for Smoking across the Americas and Africa*

At present, smoking is considered one of the largest threats to public health globally. Nonetheless, the inhalation of psychoactive substances after deliberate combustion has deep historical roots. Moreover, current models hold that smoking was invented independently in the Americas and Africa. This paper reviews the archaeological evidence available for both continents. We will examine precontact smoking practices in terms of their antiquity, the delivery devices, and smokestuffs, as well as their social settings. This will be followed by a brief reflection on the changes that occurred when the Columbian exchange network caused smoking to be disseminated far and wide. Lastly, we will draw on recent ancient metabolomics work to exemplify the potential that lies within archaeology to contribute new data to a field of study of utmost importance for the well-being of humanity at large.

Zipkin, Andrew [66] see Murray, John

**Zoeller, Gretchen (University of Pittsburgh)****[104]***A Not-So-Secret Affair: A Case Study of Treponemal Infection from the Bethel Cemetery*

When records and textual evidence from the past are subjective, piecemeal, or absent, bioarchaeological analyses can be indispensable for elucidating otherwise buried histories. The case study of Burial 505 from the Bethel Cemetery highlights an individual that displays characteristic osteological features of tertiary-stage venereal syphilis. When combined with archival and genealogical research, this probable case of treponemal infection offers a unique lens for interpreting life on the midwestern frontier during the mid-nineteenth century. Osteological evidence combined with contextual clues reveal the story of a young woman and mother who, despite tragic circumstances, was advocated for and afforded treatment in death equivalent to others in her community. Given the archaeological context, Burial 505's pathological condition speaks to the historically variable nature of how disease and disability have been recognized, treated, and perceived cross-culturally.

**Zori, Colleen (Baylor University)****[22]***Do Not Be Distracted by the Talking Dog: Aspirational Status Display by Medieval Elites at San Giuliano (Lazio Province, Italy)*

Chip Stanish once told me that a good archaeologist should be able to be thrown out of a plane anywhere in the world and find something interesting to say about the material record there. Inspired by many years under Chip's tutelage and drawing on my earlier work in the Andes, I here present data from my current research at the tenth–thirteenth-century medieval Italian castle of San Giuliano. I discuss a range of empirical evidence that although San Giuliano was built originally by a lord of one of the territorial principalities emerging in the medieval period, it was then occupied by lesser nobles or officials who aspired to display prestige but did not possess the material wealth necessary to obtain goods of the finest quality. While there are clues that the inhabitants of La Rocca aspired to display greater wealth than they perhaps possessed, they were nonetheless linked to the material indicators of status and participated in broad trade networks that connected them to other nobles throughout Italy. This work is enriched both theoretically and methodologically by Chip's contributions to archaeological inquiry into the construction of wealth and status in past societies.

**Zralka, Jaroslaw (Jagiellonian University)****[34]***Chair***Zralka, Jaroslaw (Jagiellonian University)****[11]***Dynamics of Growth and Transformation during the Terminal Classic: An Archaeological View from Nakum, Petén, Guatemala*

The Terminal Classic period (ca. AD 800–950) brings important sociopolitical and cultural changes to the Maya lowlands. Some of these changes are seen in iconography and architecture, and may reflect the migration of new people as well as the spread of new ideas across many areas of the Maya lowlands that are affected by decline and transformation. This paper examines new architectural modes visible in the centers of the Triangle Park of northeastern Guatemala toward the end of the Classic period. One of our aims is also to seek the sources of these new inspirations seen in architecture, art and other elements of material culture. Our major focus is Nakum—an important site that experienced unprecedented growth during the Terminal Classic period seen in the architectural development and demographic expansion. Archaeological data show that the Nakum's growth may have been at least in part due to the collapse of older superpowers of this region, the influx of new people coming from the neighboring abandoned sites, and establishing of new trade and cultural contacts with centers that were experiencing growth and political expansion during the difficult times of the Terminal Classic period.

Zralka, Jaroslaw [28] see Watkins, Tia

**Zuckerman, Jill and Tristan O'Donnell****[27]***Investigating Southern New England Native American Ceramic Traditions: How Form and Function Can Connect the Past to the Present*

Intact Native American pottery is rarely recovered from archaeological sites throughout New England. When it is observed, sherds tend to be small and lack integrity. During excavations along a power line corridor for a cultural resource management survey, over 25 sherds of intact Native American pottery were recovered. New England, specifically Rhode Island and Southeastern Massachusetts, yield fairly acidic soils, which do not lend to the preservation of these types of materials. To find over 25 sherds of well-preserved, intact pottery is a rarity. This discovery is not only remarkable to the archaeological community, it also holds importance to the local Native American communities. In this poster, we will explore the sherds themselves in terms of form, temper, thickness, and decoration. In addition, we will explore usage of the vessel whether it be agricultural, aquatic, or otherwise. Ultimately, we would hope to connect present Tribal communities to their past and gain insight upon Native ceramic traditions in this region.

Zuleta, Fernando [44] see McKee, Brian

Zuse, Silvana [59] see Kater, Thiago

Zvolanek, Emily [94] see Wescott, Konnie

Zwyns, Nicolas [55] see Gillam, J. Christopher

**Zych, Boleslaw, Dorota Bojkowska (Jagiellonian University, Cracow) and Juan Luis Velásquez (Proyecto COMUCH Guatemala)****[34]***Chajul and the Ixil Region during Prehispanic Times*

Archaeological, epigraphic, and ethnohistoric data indicate that Chajul was an important precolumbian center of the Ixil Maya. In this paper we present an overview of archaeological investigations conducted in the Ixil region sites. Moreover, we present the results of archaeological excavations conducted at Chajul in the 2021 season. This research is associated with the houses from which mural paintings were restored by the COMUCH (Conservation of the Chajul Murals Project) before and during the 2021 season. The major purpose of these archaeological works was to obtain information about the dating of the murals and to test the hypothesis concerning which houses with murals might have been constructed over the vestiges of precolumbian architecture. In total, four test-pits were excavated, from which archaeological material of different periods was obtained—from prehispanic, through colonial, to modern times. This paper presents the results of these archaeological works, as well as the subsequent analysis of the materials recovered during the excavations. Finally, we provide preliminary results of epigraphic analysis of hieroglyphic texts from several vessels that come from the Ixil region but now in public or private collections.

Zych, Boleslaw [28] see Palonka, Radoslaw

**Zygodlo, Gabriela (Hunter College, CUNY)****[84]***Accuracy, Precision, and Efficiency: Comparing Mapping Techniques in Nixtun-Ch'ich', Petén, Guatemala*

New archaeological survey technologies have transformed the way in which sites are mapped. Nixtun-Ch'ich' in Petén, Guatemala, has been surveyed in a variety of ways including a theodolite with an electronic distance

measurement (EDM), total station, lidar, and photogrammetry. This paper aims to compare various mapping techniques and their accuracy, precision, and efficiency when pertaining specifically to mapping in Nixtun-Ch'ich' in Petén, Guatemala. The goal is to evaluate which technique is most efficient when mapping in the site by considering the variables of cost, time, and environment of the site. The paper also considers the impact of new technologies on archaeologists as a social group.